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REDUCING INVALID VOTES AND VOTE MECHANISM COMPRESSION IN MULTIPARTY ELECTIONS: A COMPREHENSIVE APPROACH

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Abstract

There has been limited research about the impact of ballot paper design in multiparty elections and effects of information or training over the invalid vote and the vote mistakes. This study was to measure the effect of training and ballot paper design on the probability of invalid vote and vote mechanism compression. There has been applied three quasi-experimental designs with different samples, the first experiment (60 volunteers) to design a post test and control group were the hypothesis was rejected because the training doesn't reduces the likelihood of invalid ballots. The second experiment (172 volunteers) with a post-test design, a control group and two experimental treatments with different groups where the hypothesis of ballot paper decrease the likelihood of invalid ballots was also rejected. The third experiment (60 participants) with a 2x2 factorial design showed that the priming obtained through the instructional design of the on separate large sheet decreased the percentage of null vote even in cases where voters had no experience with the electoral system. The importance of the pedagogical ballot paper design and other items that are part of the voting system in the light of consumer psychology and behavioral economics are discussed.

Keywords: elections; invalid vote; training; ballot paper design; priming

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Introduction

The invalid vote has become a worrying phenomenon for the democratic system of some countries, because the invalidity of the votes may well be due to intentional behavior, but in many cases it is involuntary. Some authors have postulated as important predictor variables sociodemographic aspects (social class and education), the compulsory voting system and political protest against the Government, either due to lack of confidence in the candidates, in the system as such or in officials (Augenblick & Nicholson, 2012; Calvo, Escolar, & Pomares, 2009; Geys, 2006; Houser, Morton, & Stratmann, 2011; Power & Garand, 2007; Reynolds & Steenbergen, 2006). The generality of the phenomenon of null votes, even in groups of voters with high demographics,

Various studies have investigated the cognitive tasks that influence decision-making when voting (Winchester, Hall & Binney, 2014 & Wayne, 2014), demonstrating the importance of automatic mechanisms, the way in which information is presented and emotions. that accompany behavior (Rogers, Fox, & Gerber, 2012; Thaler & Sustein, 2008; Tversky & Kaheman, 1981). In this way, the election in multi-party systems generates a greater cognitive load than in other types of elections; As Reynolds and Steenbergen (2006) state, elaborate cards (that have colors, symbols and photographs) are cognitively expensive and represent greater difficulty in understanding for people with no experience, little information or those who are illiterate. Likewise, the results of the study by Calvo et al. (2009) demonstrated that the design of the cards and electronic voting technology make the election task difficult in a multiparty system, identifying that when voters search for the candidate's name they have a 25% probability of canceling the vote, while the voter using the party name tends to have a probability of 12%. In this study, the educational level was an indicator

of cognitive ability and was negatively correlated with voting problems, but, as Augenblick and Nicholson (2012) state, this does not mean that the voter voted at random because they did not have information about the candidates. But their vote could have been affected by the design of the card and other factors that bias the final decision, which work better when the voter has some level of education.

Voting can be analyzed from the perspective of the decision, given that individuals reason based on the evaluation of parties, candidates and other political issues, as well as in relation to the premises with which they infer the advantages or disadvantages of each option. , depending on your expectations, training, experiences and previous judgments. However, in many cases a low rationality is observed in the decision, people frequently simplify the choice process, taking various shortcuts to reach the same answer (Lewis-Beck & Stegmaier, 2007; Popkin, 1991).

Before voting, individuals are exposed to various competing persuasive messages from campaigns and the media, which aim to influence the frame of reference not only in turnout but also in the election of the candidate. However, the effects on the task will depend on variations in the cognitive loads at the moment (Sweller, 2011). A voting system that is difficult to understand, such as a multiparty election, generates a high burden because the voter must differentiate a large number of parties and candidates, making it a complex task that requires high levels of attention, and Therefore, the action of voting depends significantly on the cognitive resources of the voter. The way the card is designed, the number of names, numbers,

Therefore, Baldassarri and Schadee (2006) describe voter decision-making in a multiparty system as heuristic, fast and frugal, requiring a limited amount of

information and following the pattern of the election under uncertainty. According to Reynolds and Steenbergen (2006), in multiparty elections, vulnerability to manipulation increases because the action of voting generates a high cognitive demand in voters. Among other factors, the influence of automatic mechanisms and the importance of the way in which information is presented on decision-making when voting has been demonstrated (Thaler & Sustein, 2008; Tversky & Kaheman, 1981; Wincheser & Wayne, 2014).

On the other hand, Augenblick and Nicholson (2012) state that when there is little information about how to vote, the execution of the vote can be affected by the decision that will be made, even if it is not random, so they can influence the decision. the order of the candidates, the configuration of the electoral system, the design of the card and certain keys of the candidate such as gender, incumbency, race or ethnicity, among others. In Latin American countries, economic promises could also affect the voting process, not only because of people's needs, but because they eliminate all possible voting options beforehand, simplifying the task and reducing the uncertainty experienced by the individual (Fujiwara, 2015; Geys, 2006; LeDuc, 2015).

Considering voting as a choice behavior, this study aims to evaluate the effect of training and the design of the card on the understanding and validity of voting, thus proposing three hypotheses. The first hypothesis seeks to identify whether there are significant differences in the group that receives training before exercising voting behavior (decrease in the percentage of invalid votes) than those people who did not receive said training, where the presence of invalid votes will probably be greater. The second hypothesis states that there are significant differences in the decrease in the percentage of null votes between two independent designs of the card and those people who received the

traditional card. Finally, the third hypothesis aims to identify whether the *priming* of instructions decreases the percentage of null votes compared to those people who received the traditional card; It was also intended to establish whether there are significant differences in the decrease in the percentage of null votes in the groups that received financial reward compared to those that did not receive financial reward for completing the task. Three independent studies were carried out with experimental methodology, where the study hypotheses were tested separately. In all cases, before participation, people were asked to fill out the demographic data sheet and a scale that was intended to evaluate the level of authoritarianism. This seven-item questionnaire was based on the authoritarianism scale of Etchezahar, Prado-Gascó, Jaume and Brussino (2014). This instrument showed 2 factors (Power and Inequality) that explained 59% of the total variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was fair (0.631), with a significance level of 0.

Experiment 1

Method

Participants

60 adults (35 women, 25 men, M = 45.6 years, age range 30-65 years) were summoned and participated voluntarily , distributed in stratum 1 (6 participants), stratum 2 (43 participants), stratum 3 (11 participants), with educational levels of primary (15 participants), high school (24 participants), technician/technologist (17 participants), professional (2 participants) and postgraduate (2 participants).

Design

The first experiment corresponded to a quasi-experimental design with posttest and control group, where the independent variable consisted of the training

applied to the experimental group. An audiovisual message was included explaining how to vote for the House of Representatives and how to avoid spoiled votes.

Procedure

In the first instance, the data collection form and the authoritarianism scale were applied. In the experimental phase, one of the groups received training and was given the electoral card to simulate voting; In the case of the control group, after filling out the data form, the card used for the House of Representatives in the 2014 elections was delivered. Finally, the participants filled out a booklet with six images, where the participants evaluated whether the choice of The option corresponded to a valid or null marking.

Results

Table 1 presents the results of the ANOVA of the first study where it is evident that the model does not explain the variation of the dependent variable type of vote ($F = 0.941$; $p = 0.491$), so it was decided to reject the hypothesis of equality of means. , concluding that there is no difference between the experimental group and the control group; That is, training through an audiovisual message before voting does not reduce the percentage of null votes; In short, the results of the variance analysis allow us to argue that the political position (authoritarianism test) and the performance in the post-test do not determine the execution of the vote.

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TABLA 1
Análisis de varianza Experimento 1

Origen	Suma de cuadrados tipo III	gl	Media cuadrática	F	Sig.
Modelo corregido	1.921a	8	0.24	0.941	0.491
Intersección	9.766	1	9.766	38.278	0
TOT_POT	1.117	4	0.279	1.094	0.369
Grupo	0.121	1	0.121	0.474	0.494
TOT_POT * Grupo	0.213	3	0.071	0.278	0.841
Error	13.012	51	0.255		
Total	28	60			
Total corregida	14.933	59			

Fuente: elaboración propia.

Additionally, a correlation analysis was carried out with some variables that were measured in the initial questionnaire. It was found that the variable Power factor and Inequality factor correlate poorly but significantly ($r = 0.48$, $p = 0$). *When performing a Spearman R* correlation analysis , the same situation was found: the valid vote and the Inequality factor correlate poorly but significantly ($r = -0.39$, $p = 0.02$); Furthermore, as usual, the variable educational level and socioeconomic level also correlated significantly ($r = 0.82$, $p = 0.038$). The variables sex and age do not correlate with each other or with the other variables. It was found that the majority of null votes complied with the marking that was instructed in the header about generating a clear strikeout and not leaving the allowed spaces; However, they elected a party for the three corresponding constituencies (electoral districts), being consistent with what was found by Calvo et al. (2009) who argue that a crossed vote can occur in which the person has an established preference, but the design of the card does not allow the task to be executed in the appropriate way.

Experiment 2

Method

Participants

Experiment 2 included 172 university students who participated voluntarily (110 women, 62 men, *M* = 19.4 years, age range 18-25 years), distributed in stratum 2 (25 participants), stratum 3 (108 participants) and stratum 4. (39 participants). When asked if they had voted before, 90 of them answered "No" and 82 answered "Yes."

Design

The second experiment corresponded to a post-test quasi-experimental design with a control group and two groups with different experimental treatments. A random distribution of the participants was carried out to the three groups with which the experiment was developed.

Procedure

The participants were randomly distributed to the three groups as follows: (a) control group (57 participants), (b) card with a conventional design, but complemented with small photos of the candidates and the option number, and (c) card with photos of the candidates and the option number, but with a modification of the instructions, which consisted of expanding the space they occupied in the header and explaining in two boxes what is meant by a vote. null and valid vote (58 participants). Subsequently, a booklet with six images was given in which the participants evaluated whether the choice corresponded to a valid or null marking.

Results

Table 2 presents the results of the ANOVA for the second study in which no significant differences were found between the experimental groups and the control group regarding the dependent variable type of vote (F = 0.54; p =0.584), so the hypothesis of effects of the design of the card on the valid vote is rejected. This means that adding the photographs and names of the

candidates, as well as expanding the instructions heading does not affect the percentage of null votes compared to the traditional card, and it is also worth highlighting that the results in the authoritarianism test as well as in the post-test They do not explain any model according to the analysis of variance, which allows us to assert that the political position of the young university students did not affect the probability of null voting and that the two interventions carried out did not affect the results of the post-test.

TABLA 2
Análisis de varianza Experimento 2

Origen	Suma de cuadrados tipo III	gl	Media cuadrática	F	Sig.
Modelo corregido	0.257a	2	0.128	0.54	0.584
Intersección	66.497	1	66.497	279.694	0
Diseño tarjetón	0.257	2	0.128	0.54	0.584
Error	40.179	169	0.238		
Total	107	172			
Total corregida	40.436	171			

Fuente: elaboración propia

In Experiment 2, a significant Spearman correlation was found between the variables type of vote and voting history (r = -0.19 p = 0.10), meaning that participants who usually vote tend to do so correctly and those who have not voted tend to do it incorrectly. Likewise, as expected, a low but significant correlation was found between age and voting history *(r* = 0.62, p = *0)*. A low positive correlation was also found between the null vote and the Power factor (r = 0.48, p =0.47), on the scale that was applied before starting participation. In this study, what was observed in Experiment 1 regarding null marking was repeated; The participants met the criteria of clear marking and within the spaces established either by the election of the party, the candidate or both, but they marked in the three available constituencies, which nullified the vote.

Experiment 3

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Method

Participants

60 university students participated voluntarily (30 women, 30 men, *M* = 19.6 years, age range 18-28 years). Regarding socioeconomic level, 12 participants from stratum 2, 39 from stratum 3 and 9 participants from stratum 4 were included. Of this sample, 47% had voted before, while 53% had no experience as a voter.

Design

The third experiment consisted of a 2x2 factorial design where the independent variables were the design of the card (card with instructions on a separate page, *priming* type vs. conventional design) and the reward (presence/absence).

Procedure

15 participants were randomly distributed to each of the 4 groups. In condition 1, participants received the two-page card with detailed cover-type instructions. In the first of them, instructions and diagrammed examples of ways to make a wrong vote appeared; in the second, the voting options similar to the conventional card. On the other hand, in condition 1 there was the promise of an economic reward consisting of a bonus, if they managed to vote correctly without generating a null vote. In condition 2, the promise of financial reward was maintained, but the card was conventional. In conditions 3 and 4, there was no promise of a bonus for correct voting; in condition 3, people received the *priming- type card.*and in 4 the conventional card. At the end of the task, they were given a booklet with six images in which the participants evaluated whether the choice corresponded to a valid or null marking.

Results

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Table 3 presents the ANOVA results corresponding to the third experiment, where it was found that the model explains a significant part of the variation of the dependent variable type of vote (t = -2.807, p = 0.007), with an observed power of 0.788.

Tabla 3
Análisis de varianza del Experimento 3

Parámetro	B	Error típico	t	Sig.	Intervalo de confianza 95%		Eta al cuadrado parcial	Parámetro de no centralidad Parámetro	Potencia observadab
					Límite inferior	Límite superior			
Intersección	0.533	0.084	6.352	0	0.365	0.701	0.41	6.352	1
[Diseño tarjetón = 0]	-0.333	0.119	-2.807	0.007	-0.571	-0.096	0.12	2.807	0.788

Fuente: elaboración propia

The individual effects of the card design indicate that while participants with the *priming* design tend to vote valid, participants with the traditional design tend to vote null. Likewise, no effects of the reward on the valid vote were found, nor were any correlations observed with the authoritarianism score or with voting history. However, although the percentage of null votes decreased, what was stated in study 1 and 2 regarding null marking also occurred; on this occasion, those people who made a mistake in their vote marked less frequently in the three constituencies, so His vote was void.

General discussion

The three experiments allow us to establish several interesting points both for the investigation of voting behavior and also for those organizations in charge of regulating the electoral system in multi-party systems. First, the hypothesis that voter training generates a lower proportion of null votes was rejected. This means that the development of workshops, seminars, awareness days, etc., does not significantly affect the null vote and that it is preferable to look for other options to improve skills with the multiparty electoral system. Likewise, the

hypothesis that the simple inclusion of photographs of the candidates and the image of a valid marking vs. a null marking is sufficient to generate a significant decrease in null votes. This implies that fixing the graphic design of the electoral cards does not affect the null vote and that a didactic approach is required in which the management of a high cognitive load is achieved. This was verified through Experiment 3, in which those people who received a card with various examples of valid and invalid votes, with a large size and easy reading, significantly improved their voting behavior. In this way, it was shown that the with a large size and easy reading significantly improved their voting behavior. In this way, it was shown that the with a large size and easy reading significantly improved their voting behavior. In this way, it was shown that the*Priming* of instructions reduces the percentage of null votes compared to those people who received the traditional card where voters find too many options very difficult to discriminate and where some see their political freedom to express their preferences restricted.

Experiment 3 supports the idea that the limited information that voters handle generates an effect on voting behavior, since the signals provided by the card designs are receptive at the time of the election, so it can be presented a manipulation effect and the response, although the choice is not random, will depend on the cognitive resources of the voter (Augenblick & Nicholson, 2012; Calvo et al., 2009). An important point that was found in this same experiment is that the financial remuneration for correctly executing the voting behavior does not significantly influence the validity of the vote, so it can be stated that the didactic design of the card and the *priming*achieved through the separate cover and size improve the understanding of what a valid vote is and tend to reduce the high cognitive load generated by the complexity of the election in a

multi-party system. According to Reynolds and Steenbergen (2006), for a large proportion of the electorate this is a difficult task, and it is common for the election system to be designed without taking into account the sophistication of the ballot design.

Now, according to Lau and Redlawsk (2007) and Fowler and Margolis (2014), it is evident that the average citizen does not meet the democratic ideal of an informed electorate, which is why there may be difficulties in expressing their vote in multi-party systems, having Keep in mind that these types of elections have low involvement. What was found through the three experiments carried out in this study shows that developing the task in the most accurate way possible depends on the design of the card, but that this is not enough. Simply informing what is a valid or invalid vote in the header does not prevent people from being induced by the titles of the constituencies, generating the annulment of the vote, a fact that was controlled in Experiment 3 by presenting in the *priming*graphic examples about incorrect marking due to the election of more than one party.

By rejecting the hypothesis of the first study, it was found, in accordance with the statements of Calvo et al. (2009), that information generates diverse effects, even more so when differences in the educational level and political knowledge of the electorate are evident; That is, citizens with established preferences may not be affected by the symbolic manipulation of the cards and some will vote the same way regardless of the design of the card. On the other hand, by rejecting the hypotheses of the second study, what Reynolds and Steenbergen (2006) claim is confirmed, and that is that there is little evidence to suggest that an elaborate ballot reduces the percentage of null votes or serves as a tool for illiterate voters.

The importance of considering the complexity of the task of voting on a ballot such as the one found in multiparty elections is evident in those voters who voted incorrectly, since, regardless of the level of experience, the participants in both study 1 and 2, as well as those corresponding to the traditional design of study 3, presented a choice that met the criteria of the instructions located in the headings and that are taken into account for any type of choice. These criteria include clear marking that does not go beyond established limits and marking only once; However, a bias effect was observed due to the titles and for this reason many voters marked all the constituencies.

Experiment 3 provides information to reduce the cognitive load faced by potential voters, taking into account that, according to the theory of cognitive load, working memory is responsible for organizing, contrasting, comparing and working on information, being likely to process two or three elements at the same time instead of the set of information, so *priming*It manages to separate the stimuli, in this case the instructions, and exemplify them, imposing a reduction in the cognitive load in the action of voting and affecting attention (Kirschner, 2002; Sweller, 2011). In contrast to what was found by Kirschner (2002), it is proven that the construction of schemas reduces the load on working memory, helping to store and organize information. Experience is also important, as in Experiment 2 where a correlation was found between age and voting history; however, the didactic design and priming *increased* the understanding of voting, even without having experience with the electoral system.

It should be noted that in the instructions to execute the behavior, it was emphasized that the present study did not intend to evaluate affinity or political knowledge, so any marking in any of the parties present on the card was going

to be evaluated in the same way. manner. Thus, in the information collection form, a low affinity of the participants for the political parties was found, then assuming that the choice they made was not strategic (Fieldhouse, Shryane, & Pickles, 2007) and although they did not belong to any of them the special constituencies, randomly chose one of the available parties. This study sought to control the markings that are taken as voluntary cancellation and took into account a population with experience in elections as well as potential voters who just meet the minimum age criteria. Following the line of the study carried out by Calvo et al. (2009), the logos and names of the parties should be maintained since they guide the election and tend to reduce the percentage of null votes.

The present study suggests that it is essential to investigate the problem of null votes from the perspective of consumer psychology and behavioral economics, in order to identify the processes involved, and from them design a manageable system for the electorate, which allow them to exercise their democratic rights to vote. Maintaining a complex system that generates a high cognitive load implies, as the three experiments described in this article demonstrate, restricting the possibility of freely expressing electoral preferences.

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