Choice under Complexity: A Heuristic-Systematic Model of Electoral Behavior

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Abstract

This study develops and empirically substantiates a heuristic-systematic model of electoral behavior, in which we understand vote choice as a two-stage decision making process. In the first stage voters use broad-based heuristics, such as partisanship, to narrow down all possible choice options to a few viable choices. This subset of choice alternatives constitutes the *choice set*. In a subsequent second stage voters engage in more systematic processing behavior using campaign issues to select a final alternative from the choice set. We apply these ideas to the 1992 US presidential elections and introduce a choice set logistic regression (CSLR) model which allows for the examination of both stages of electoral choice. The empirical results demonstrate that the heuristic-systematic model of electoral choice allows us both to better understand the electoral competition between Bush, Clinton and Perot in 1992 and to discover which voters are more inclined to consider more than one choice option. Consequently, this study has important implications for students of voting behavior and electoral competition and enriches our understanding of voters' choices in third- or multi-party races.

Understanding electoral choice is vital to understanding politics. It should come as no surprise then that the explanation of choice behavior has received widespread scholarly attention within political science ever since the 1940s (see e.g., Berelson, Lazarsfeld and McPhee, 1954; Lazarsfeld, Berelson and Gaudet, 1944; Downs, 1957; Campbell et al., 1960). Choice models have played an ever more important role in this endeavor (for different flavors of such models see e.g., Alvarez and Nagler, 1998; Born, 1990; Whitten and Palmer, 1996). The purpose of the present study is to propose a new type of choice model that better captures current insights from psychology and behavioral economics about choice behavior. This model is the choice set logistic regression model, which maps onto a dual-process logic that figures ever more prominently in the study of political behavior (Basinger and Lavine, 2005; Lau and Redlawsk, 2006; Marcus, Neuman and MacKuen, 2000; Ottati, 1990, e.g.,). We argue that this model presents an excellent vehicle for understanding electoral choice.

Our point of departure is the observation that choice models ought to constitute a realistic representation of underlying decision processes. This does not only mean that they should include the right predictors. More fundamentally, it also means that the underlying choice mechanism is compatible with basic insights about human decision making. We maintain that political scientists have not gone far enough in theorizing and constructing realistic choice models. Psychology and behavioral economics have long since shown that decision makers, either because of cognitive limitations or because they want to minimize effort, have difficulties with considering a large pool of alternatives (Chaiken, Liberman and Eagly, 1989; Downs, 1957; Fiske and Taylor, 1984; Simon, 1955; Tversky, 1979). Within political contexts decision makers also often face a large variety of choice options. Consequently, it seems reasonable to assume that similar psychological processes are at work here and underpin political behavior. In other words, there is no *a priori* reason to assume that decision makers within the political realm engage in different decision making processes. Yet, when studying electoral decisions in which voters are more often than not faced with a large set of choice options, political scientists mostly assume that all alternatives are under consideration.

How can we construct a realistic account of choice behavior in the context of elections that takes into consideration voters' cognitive limitations and the necessity of information short-cuts? Borrowing recent insights from psychology and economics that deal with decision making under complexity, we propose a heuristic-systematic model of vote choice that understands electoral choice as a two stage process. In the first stage, voters pare down the possible set of choice options on the

ballot to several viable alternatives, i.e. the *choice set*. While in the second stage, voters reach their final choice by picking one choice option from this choice set. Not only do we distinguish between a choice set and a final choice stage, we also argue and empirically substantiate that different decision making logics are at work in both stages. The choice set stage, in which the universe of alternatives is winnowed, is characterized by a decision making logic relying on long-standing heuristics such as party identification or general ideology. These heuristics allow voters to minimize cognitive effort. Sometimes these heuristics suggest one clear choice, that is to say upon their application only one alternative remains, but most often they leave open multiple alternatives. This choice set must subsequently be scrutinized through an additional systematic processing decision logic based on short-term information about contemporary issues relating to the campaign.

We translate this two-stage decision logic into a choice set logistic regression (CSLR) model, which allows for the empirically analysis of this phased decision making process. The utility of the CSLR model and heuristic-systematic approach to electoral behavior is demonstrated by an application to the 1992 US presidential elections. This election received extensive scholarly attention as it was characterized by the strongest showing of a third party candidate since the Second World War (see e.g. Alvarez and Nagler, 1995; Gold, 1995; Koch, 1998; Lacy and Burden, 1999; McCann, Rapoport and Stone, 1999; Owen and Dennis, 1996; Rapoport and Stone, 2005; Rosenstone, Behr and Lazarus, 1996; Zaller and Hunt, 1994, 1995). H. Ross Perot secured about 20 percent of the popular vote. Due to the high level of public support for this third party candidate, the 1992 election presents us with a unique opportunity to put our heuristic-systematic model to the test.

Specifically, we address two sets of questions. The first relates to the way American voters made up their minds in these elections. How common were choice sets consisting of Bush and Perot versus those consisting of Clinton and Perot? And within these choice sets of major and third party candidates, how likely was it to choose Perot? And which factors were key in voters' decision-making processes? Answers to these questions shed light on the complex decision making processes American voters faced in the 1992 elections. A second set of questions relates to the determinants of choice set size. Specifically, we aim to uncover which voters had to go beyond the heuristic stage of our choice model. Were these voters characterized by low levels of political knowledge and interest? Or those with major party indifference and candidate ambivalence? By considering these factors, we get a sense of which types of individuals consider multiple options in an election.

Overall, the empirical results demonstrate the utility of the heuristic-systematic

model of electoral behavior in third- or multi-party elections. The distinction between a choice set and choice stage enables us to not only better understand the electoral competition between Bush, Clinton and Perot in 1992, but also allows us to uncover which voters are more inclined to consider more than one choice option. Consequently, this study has important implications for the study of voting behavior and electoral competition and enriches our understanding of voters' choices in third-party or multi-party races.

The remainder of the study is structured as follows. In the next section, we describe the logic of the heuristic-systematic model and its translation into electoral choice. This is followed by discussion of choice set size and its determinants. After elaborating our data and methods, we present the empirical results. Finally, we conclude by drawing several general lessons from our analysis for future work on voting behavior and electoral competition.

A Heuristic-Systematic Model of Vote Choice

General Logic

Dual-process theories have become common-place in social psychology (for a review see Liberman, 2001). In general, these theories maintain that the same individual can process information and make decisions through different processes. Some of these processes are effortful, while others are less so. To a considerable extent, individuals are adaptive, using the process that best suits their current goals.

One of the most prominent dual-process theories is the heuristic-systematic model developed by Chaiken and her colleagues (Chaiken, 1980, 1987; Chaiken, Liberman and Eagly, 1989; Chen and Chaiken, 1999). Here, systematic processing refers to the systematic use of decision-relevant information. When in systematic processing mode, individuals absorb and take heed of the decision-relevant information that is currently available. Based on this information they carefully piece together a decision. Systematic processing, then, is effortful processing. By contrast, heuristic processing requires much less effort. Here, the decision maker applies a set of judgmental rules—often in the form of standing decisions—that operate independently and in insulation from the information environment. Indeed, heuristic processing requires very little attention to contemporaneous information. Instead, the decision maker relies on set procedures that have demonstrated their utility in the past.

What determines whether a decision-maker engages in heuristic or systematic

processing? Two principles are important. The first principle is the *least-effort principle*: all else equal, individuals try to minimize the effort spent on making a judgment or decision. Given limited resources and numerous demands on their time, people try to arrive at judgments and decisions as quickly and painlessly as possible (e.g., Shugan, 1980; Lupia and McCubbins, 1998; Basinger and Lavine, 2005; Lavine, Johnston and Steenbergen, 2011). This suggests that people are naturally drawn to heuristic processing. But this is not the end of the story. A second principle that is at work is the *sufficiency principle*: all else equal, people want to feel sufficiently confident they have made the right judgment or decision. Their confidence level so to speak, has to pass a certain sufficiency threshold which may vary across individuals and decision tasks. If heuristic processing yields sufficient confidence, then there is no need to engage in systematic processing. When this is not the case, however, then decision makers will engage in systematic processing to attain their required confidence level (Basinger and Lavine, 2005; Lavine, Johnston and Steenbergen, 2011).

In decision making, one obvious violation of the sufficiency principle occurs when heuristics fail to produce a conclusive choice. When multiple alternatives remain after the application of heuristics, then decision makers clearly have to take an additional, systematic processing step to arrive at a final decision. Heuristic processing alone does not produce sufficient confidence to eliminate all but one alternative. The decision maker is torn between at least two alternatives and has to engage in further information processing to define a final choice.

Implications for Vote Choice

The aim of this study is to directly apply the insights of heuristic and systematic processing which are common-place in social psychology to voters' decision making at the ballot box. We argue that the underlying choice mechanism underlying ballot choices we as political scientists postulate should follow basic insights about human decision making. Voters often face a multitude of ballot choices which makes electoral decision making inherently complex. Consequently, electoral choice behavior will most likely follow the same patterns as found in decision making in other contexts, like consumer behavior for example. While psychologists and economists have developed sophisticated theoretical and empirical models to deal with the complexities involved in deriving choices from a large set of alternatives, most models routinely employed by voting behavior scholars start from the assumption that all alternatives are under consideration. In light of inherent complexity voters face in

multi-party and multi-candidate electoral races this seems a rather unrealistic assumption. We aim to remedy this by proposing we a heuristic-systematic model of vote choice.

The distinction between heuristic and systematic processing has left its mark on electoral research, even when these precise terms are not always used (see e.g., Basinger and Lavine, 2005; Lau and Redlawsk, 2006; Lavine, Johnston and Steenbergen, 2011; Marcus, Neuman and MacKuen, 2000; Ottati, 1990). In these studies, heuristics are often cast in terms of dispositions, which can be viewed of as standing decisions or even habits. Standing decisions include partisanship and ideology in the case of party choice (Marcus, Neuman and MacKuen, 2000; Rahn, 1993), and past participation in the case of abstention (Plutzer, 2002). Building on this work and in accordance with the heuristic-systematic model, we propose that electoral decision making proceeds in two stages. First, guided by the least-effort principle, decision makers apply heuristics to arrive at a decision. Put differently, in a first step, voters use long-standing heuristics, such as party identification, to reduce the possible set of choice options. These heuristics allow voters to substantially reduce their cognitive effort. If heuristic processing yields a single alternative, then it is chosen and no further information is considered. If heuristic processing reduces the universe of alternatives to a subset consisting of more than one alternative, i.e. *choice set*, the decision maker subsequently engages in systematic processing to arrive at a decision. Transferring this logic to voters' actions in the voting booth, we expect voters to engage in the systematic processing of additional information to choose one option from their choice set. In line with Marcus, Neuman, and MacKuen (2000), systematic processing can be seen as reliance on contemporaneous information about campaign issues.[1]

We examine the theoretical and empirical utility of our heuristic-systematic model of vote choice by applying it to the 1992 US presidential elections. This election received widespread scholarly attention due to the strongest third-party showing of H. Ross Perot after 1945 (see e.g. Alvarez and Nagler, 1995; Gold, 1995; Koch, 1998; Lacy and Burden, 1999; McCann, Rapoport and Stone, 1999; Owen and Dennis, 1996; Rapoport and Stone, 2005; Rosenstone, Behr and Lazarus, 1996; Zaller and Hunt, 1994, 1995), and thus provides an ideal testing ground for our heuristic-systematic model as US voters under normal circumstances are only faced with two viable choice options in a presidential election. It is extremely interesting to examine if our model can explain the ways in which American voters were

[1]Candidate trait information is also relevant here, but will not be considered in this paper.

able to deal with this increased level of electoral complexity.

Our vote model for the 1992 elections thus contains two stages. In a first stage, we assume that voters relied on heuristics such as partisanship and past voting habits to narrow down the universe of alternatives. If this stage produced a clear outcome, then voters would select it and ignore information about specific campaign issues. If it did not, then voters would proceed to a second stage in which current information about key issues is used to settle on a final choice among the remaining alternatives. In the 1992 elections, three campaign issues were of particular importance: the economy, health care, abortion and the deficit (Abramson, Aldrich and Rohde, 1994; Alvarez and Nagler, 1995; Lacy and Burden, 1999). Thus, voters engaging in systematic processing are likely to have relied on their positions on these issues to render a decision. We now turn to the explanation of our choice set modeling approach as well as an elaboration of the size of voters' choice sets in the 1992 election.

Choice Set Modeling

To reflect the logic of the heuristic-systematic model, we adopt a choice set modeling approach (Başar and Bhat, 2004; Ben-Akiva and Boccara, 1995; Gilbride and Allenby, 2004; Manski, 1977; Moe, 2006; Paap et al., 2005; Roberts and Nedungadi, 1995; Roberts and Lattin, 1997; Shocker et al., 1991). This class of models decomposes choice into two stages: a consideration stage and a choice stage. In the consideration stage, decision makers pare down the alternatives to a subset, which is known as the choice/consideration set. In the choice stage, one alternative is selected from the choice set (in as far as it still contains multiple options).

To formalize this idea, consider a decision maker q who has to select one alternative from the universal choice set $M = \{A, B, C, P\}$, where $A = abstain$, $B = Bush$, $C = Clinton$, and $P = Perot$. Let G be the power-set of M, consisting of all possible sub-sets of alternatives (excluding the empty set). With four alternatives, G contains $2^4 - 1 = 15$ elements. These include four choice sets consisting of one alternative ($\{A\}, \{B\}, \{C\}, \{P\}$), six choice sets consisting of two alternatives ($\{AB\}, \{AC\}, \{AP\}, \{BC\}, \{BP\}, \{CP\}$), four choice sets consisting of three alternatives ($\{ABC\}, \{ABP\}, \{ACP\}, \{BCP\}$), and one choice set containing all four alternatives ($\{ABCP\}$).

Call the generic choice set S, where $S \subseteq M$, and let i be a particular alternative.

Then, following Manski (1977), the probability of choosing alternative i is given by

$$\pi_q(i) = \sum_{S \in G} \pi_q(i|S)\, \pi_q(S) \quad (1)$$

This means that i's choice probability is driven by the conditional probability of selecting it from a particular choice set multiplied by the unconditional probability of generating this particular choice set (and this summed over all possible choice sets). Note that $\pi_q(i|S) = 0$ if i is not contained in the choice set. Further, $\pi_q(i|S) = 1$ if i is the only element in the choice set. In this case, the choice stage of the model becomes irrelevant.

The approach taken in choice set modeling is to build separate models for $\pi_q(S)$ and $\pi_q(i|S)$. This can be done in a variety of ways. Here, we adopt logit specifications for the two models, where the logit specification for the choice set probabilities contains heuristic criteria and that for the conditional probabilities contains more cognitively demanding decision criteria.

Consideration Stage

The consideration stage is concerned with modeling $\pi_q(S)$. It can be conceived of as a screening process, resulting in the potential elimination of some of the alternatives (Swait and Ben-Akiva, 1987). Let z_{qi} be a $P \times 1$ vector of screening attributes, which may include attributes of the alternatives and decision makers. It is assumed that decision makers weight each of these attributes with weights contained in the $P \times 1$ vector γ. The weighted sum over the attributes, $A_{qi} = z'_{qi}\gamma$, can be seen as an overall evaluation of the alternative. An alternative is included into the consideration set if A_{qi} exceeds some cutoff value α_i, which is the threshold of inclusion for alternative i. Let I_{qi} be an indicator that takes on the value 1 if decision maker q considers alternative i and 0 otherwise. The formal inclusion criterion can now be stated as

$$I_{qi} = 1 \quad \text{iff} \quad A_{qi} > \alpha_i$$

This screening mechanism is compensatory in nature in that, in principle, strong attributes of an alternative can offset weak ones (Hauser and Wernerfelt, 1990; Roberts and Lattin, 1991).[2]

[2] In other research, we have specified non-compensatory screening mechanisms. However, in the present model, we argue that voters may rely on a number of different heuristics that can each add information about the alternatives.

Note that the cutoff value α_i is allowed to vary across alternatives and may thus be lower for some alternatives than for others. This makes it possible to consider the inherent appeal of some alternatives. Specifically, for inherently appealing alternatives the cutoff will be lower than for unappealing ones. In an electoral context, one can think of the variation in cutoffs as being driven by the valences of parties or candidates (Schofield, 2008).

Allowing for unobserved heterogeneity across decision makers, we add a stochastic component, δ_{qi}, to the screening rule. Thus, an alternative is included iff $A_{qi} + \delta_{qi} > \alpha_i \Leftrightarrow A_{qi} > \alpha_i - \delta_{qi}$. This expression suggests that the threshold of inclusion is modified by an alternative-specific stochastic component. When we now assume that δ_{qi} follows a standard logistic distribution and write the inclusion criterion as $\delta_{qi} > \alpha_i - z'_{qi}\gamma$, then the inclusion probability of an alternative is given by

$$\begin{aligned} \omega_{qi} &= \Pr\left(I_{qi} = 1\right) \\ &= \frac{1}{1 + \exp\left(\alpha_i - \boldsymbol{z}'_{qi}\boldsymbol{\gamma}\right)} \end{aligned} \tag{2}$$

To go from the inclusion probabilities to the choice set probabilities, we recognize that each choice set includes certain alternatives and excludes others. If we assume the inclusion probabilities to be independent, then the choice set probability is given by

$$\pi_q\left(S\right) = \frac{\prod_{i \in S} \omega_{qi} \prod_{j \notin S} \left(1 - \omega_{qj}\right)}{1 - \Pr\left(Empty\right)} \tag{3}$$

Here, $1 - \Pr\left(Empty\right) = 1 - \prod_i \left(1 - \omega_{qi}\right)$ is a normalizing constant to account for the exclusion of the empty consideration set. Other than this, equation (3) simply is the product of the inclusion probabilities, ω_{qi}, of the included alternatives with the product of the exclusion probabilities, $1 - \omega_{qj}$, of the excluded alternatives.

Choice Stage

The choice stage is concerned with modeling $\pi_q\left(i|S\right)$. This phase can be conceived of in terms of utility maximization among the alternatives that are included in a choice set. By this logic, an alternative is chosen if its utility exceeds that of all other alternatives in the choice set: $U_{qi} > U_{qj} \forall j \neq i \in S$. Making the conventional assumption that utility can be decomposed into a fixed (V_{qi}) and random component (ϵ_{qi}), the choice criterion may also be stated as $V_{qi} + \epsilon_{qi} > V_{qj} + \epsilon_{qj} \forall j \neq i \in S$.

Finally, the fixed utility component can be modeled as a function of attributes (of alternatives and decision makers) contained in the $Q \times 1$ vector x_{qi} with associated parameter vector β. Thus, the choice criterion may also be stated as

$$\begin{aligned} x'_{qi}\beta + \epsilon_{qi} &> x'_{qj}\beta + \epsilon_{qj} \\ \left(x'_{qi} - x'_{qj}\right)\beta &> \epsilon_{qj} - \epsilon_{qi} \end{aligned}$$

$\forall j \neq i \in S$. Note that, in general, the vector x_{qi} may contain different predictors than z_{qi}. In the heuristic-systematic model, $\boldsymbol{z}_{qi}$ contains heuristsics (e.g., partisanship and ideology), while $\boldsymbol{x}_{qi}$ contains systematic evaluation criteria (e.g., current issues).

If we now assume that the stochastic components are independent and follow a Gumbel distribution, then a conditional logit model follows (**?**):

$$\pi_q\left(i|S\right) = \frac{\exp\left(x'_{qi}\beta\right)}{\sum_{k\in C}\exp\left(x'_{qk}\beta\right)} \tag{4}$$

where the numerator sums over all alternatives in the choice set. The usual identification restrictions apply to this model. Equation (4) gives the conditional selection probability for an alternative.

The complete model takes equations (3) and (4) and places them into (1). Now, by using data on the final choices of decision makers, we can obtain estimates of the choice set and conditional selection probabilities and the parameters associated with $\boldsymbol{x}$ and $\boldsymbol{z}$.

Explaining Choice Set Size

In choice set modeling, choice set size refers to the number of alternatives considered by a decision maker in the choice stage. Average choice set size is the expected size of the choice set and can be computed quite easily from the CSLR:

$$|\bar{S}|_q = \sum_{S\in G} |S|\ \pi_q(S) \tag{5}$$

Here |S| is the cardinality of the choice set and all other terms are defined as before.

A consideration of the average choice set size is useful, as it gives an indication of how successful heuristic processing is. To the extent that heuristics successfully eliminate all but one alternative, τ should approach 1. This would suggest that the

heuristics applied in the consideration stage apparently provide sufficient confidence to pick a single alternative.

Apart from describing the average choice set size, it can also be quite interesting to model it. This allows one to ask who derives sufficient confidence from heuristic processing and who does not. For the heuristic-systematic vote model, several explanations of average choice set size suggest themselves. These include, major candidate negativity, major party indifference, ambivalence, political interest, and political knowledge.[3]

Political scientists have often argued that indifference, if not downright negativity, toward the major parties and their candidates was an important factor in the 1992 elections (Koch, 1998; McCann, Rapoport and Stone, 1999; Owen and Dennis, 1996; Rapoport and Stone, 2005; Rosenstone, Behr and Lazarus, 1996). The effect of indifference may well have been to expand the average size of the choice set. Indifferent between the two major parties and their candidates, voters may have considered both Bush and Clinton but may additionally have considered Perot and perhaps abstention as alternatives. The effect of negativity may also have been expansion of the choice set, since individuals with negative sentiments about both major party candidates are unlikely to have picked just one of these candidates and are likely to have considered both Perot and abstention as realistic options.

A voluminous literature has begun to consider the role of ambivalence in politics. One central claim in this literature is that ambivalence increases uncertainty and decision difficulty (see Alvarez and Brehm, 1995; Basinger and Lavine, 2005; Lavine, 2001; Lavine and Steenbergen, 2005; Lavine, Johnston and Steenbergen, 2011). The reason is that ambivalent individuals are torn between different alternatives—they experience a gravitational pull toward multiple options or, put differently, they are considering multiple alternatives. All else equal, then, ambivalence should increase the size of the choice set. Here, we shall focus on ambivalence toward the major party candidates (Lavine, 2001). If a person is torn between Bush and Clinton, this should increase the likelihood of considering both candidates. It might also increase the probability, however, to consider a third-party alternative as a possible tie breaker (e.g., Lavine and Steenbergen, 2005; Lavine, Johnston and Steenbergen, 2011). Individuals experiencing major party candidate ambivalence may even add abstention to their choice set, as the level of decision difficulty may be so great as to make it impossible to choose one candidate over another.

Finally, political interest and knowledge may play a role in determining choice set

[3]We refrain from considering the role of partisan strength, since this is already explicitly considered in the first stage of the CSLR.

size. The direction here not so clear-cut, however. On one hand, one could argue that the politically interested and informed may possess so much information as to make it difficult to quickly hone in on one candidate. On the other hand, one could also argue that interested and knowledgeable individuals are particularly adept at making decisions and may, therefore, be extremely good at applying heuristics (e.g., Lau and Redlawsk, 2006). If that is the case, then, we should expect the average choice set size to be lower for politically interested and knowledgeable citizens.

Methods

Data and Measures

The data come from the 1992 American National Election Studies (ANES; Miller et al., 1999). The dependent variable is vote choice and comprises four categories: voting for Bush, voting for Clinton, voting for Perot, and abstention. For the consideration stage, separate models are estimated for the inclusion probabilities of each of these alternatives. In the choice stage, voting for Bush is treated as the baseline category in the second stage of the choice set model.

Consideration Stage The consideration stage contains a number of heuristics. First, the inclusion probabilities for all alternatives are assumed to be influenced by partisanship. Party identification is probably the most fundamental heuristic in American politics (e.g., Rahn, 1993). It should help voters to narrow down the set of alternatives quickly. We include partisanship in the form of strength of identification with the Democratic and Republican parties, with both measures ranging from 0 to 3. For true independents, both of these measures attain the value of zero. For Democrats, identification with the Republican party is zero; for Republicans, identification with the Democratic party is zero. By having two separate strength measures, we can detect asymmetries in the effects of partisanship on the different alternatives.

Ideology is a second heuristic that is included in the consideration stage. We conceive of this as a snap judgment of whether a candidate leans in the same ideological direction as the voter, i.e., the heuristic is a directional heuristic. According to directional theory, voters care less about ideological proximity than about ideological direction (Rabinowitz and Macdonald, 1989). In directional voting, the intensity of a candidate's ideological position is also of great importance. But if we treat ideology as a heuristic, it is more likely that a voter simply assesses if she and

the candidate share similar ideological views. Ideology is thus a dummy, that takes on the value of 1 if the voter believes his/her ideology is consistent with that of the candidate and 0 if she believes it is not.[4] A candidate will be included in the choice set if the ideological direction dummy for that candidate is one. Since, similarity or difference in ideological direction does not apply to abstention, it enters only the inclusion equations for Bush, Clinton, and Perot.

A third heuristic is whether a person voted in the 1988 elections. Since voting is somewhat of a habit (Plutzer, 2002), one would expect that individuals who had voted in an earlier election would vote again. Since we do not have a panel that goes back to 1988, we rely here on a respondent's recall of whether they had voted in the previous presidential election. This is coded 1 if they abstained and 0 if they voted in 1988.

Choice Stage In the choice stage, four predictors drive the model, to wit the respondent's stance on the issues of abortion and health care, her retrospective evaluation of the national economy as well as the evaluation of the importance of the deficit. All these issues played a central role in the 1992 campaign (Abramson, Aldrich and Rohde, 1994; Alvarez and Nagler, 1995; Lacy and Burden, 1999). The scale for economic retrospection runs from 0 (the economy "has gotten much worse" over the past year) to 4 (the economy "has gotten much better"). The health care scale runs from 1 (support for a government insurance plan) to 7 (support for a private insurance plan). The respondent's abortion stance is measured in a 4-point scale, ranging from 1 ("abortion should never be permitted") to 4 (women should "always be able to obtain an abortion"). Finally, a respondent's evaluation of the importance of the deficit within the 1992 campaign is added to the choice stage as this was a key issue in the Perot campaign. We created a dummy variable which takes on the value of 1 if a respondent mentioned the deficit as one of the three most important issues in the 1992 campaign.

Predictors of Choice Set Size Five predictors are used to model the average choice set size: major party indifference, major candidate negativity, major party ambivalence, political interest, and political knowledge. Major party indifference is measured as the number of times a respondent indicated to see no difference between Democrats and Republicans in their ability to address the following issues: the national economy, foreign affairs, poverty, and affordability of health care. Major

[4] More precisely, the direction dummy takes on the value of 1 if $(V - N)(C - N) \geq 0$, where V denotes the voter, C the candidate, and N the ideological neutral point.

candidate negativity is tapped through the open-ended candidate likes and dislikes questions of the ANES. This is a dummy variable that takes on the value of 1 if a respondent reports only dislikes for both Bush and Clinton.

Major party ambivalence is also based on the ANES open-ended likes and dislikes questions. It is defined as the relative pulls toward the Democratic and Republican party. The pull toward the Republicans (R) is given by the number of likes mentioned about the party and the number of dislikes mentioned about the opponent party, the Democrats. Similarly, the pull toward the Democratic party (D) is given by the number of likes mentioned about the Democrats and the number of dislikes mentioned about the Republicans. Major party ambivalence arises when a person experiences pulls toward both the Republican and Democratic party. This is captured through the following formula:

$$Amb \quad = \quad \frac{D+R}{2} - |D-R|$$

(see Basinger and Lavine, 2005; Lavine, 2001). Negative values on the formula indicate a predominant pull in one direction, something one could call "univalence." Positive values indicate pulls in the direction of both the Republicans as well as Democrats and, as such, reflect major party ambivalence.

Political interest is operationalized by two items: interest in the political campaign and interest in public affairs. High scores on this measure indicate greater levels of interest. Political knowledge consists of the number of correct answers given to the following questions: the political offices of Dan Quayle, William Rehnquist, Boris Yeltsin, and Thomas Foley, correct identification of the institution that can declare laws unconstitutional, and correct identification of the office that can nominate judges to federal courts.

Estimation

Estimation of CSLR models is complicated due to the fact that the likelihood function is not always globally weakly concave. This problem can be overcome by adding prior information. Here, we follow the advise of Gelman et al. ((2008) and use weakly informative independent Cauchy(0,2.5) priors. Such priors "stabilize" the posterior, allowing for fast convergence, without introducing too much information.[5] Estimation can proceed through standard hill-climbing optimizers; in our case, this is the BFGS algorithm. Results based on a full-fledged MCMC analysis

[5] If anything the bias is in a slightly downward direction (Gelman et al., 2008).

using the Metropolis-Hastings algorithm are identical.

Results

We present our results in three parts. We start by discussing the estimates for the heuristic-systematic model. Next, we discuss the choice sets implied by the model. Finally, we discuss the influences on average choice set size.

Estimates for the Heuristic-Systematic Model

Table 1 shows the estimates of the heuristic-systematic model, broken down by stage. Focusing first on the consideration stage, we observe a positive effect of the directional heuristic on selecting Bush, Clinton, and Perot into the choice set. All else equal, these candidates are more likely to be included into the choice set when a citizen believes she shares the same ideology. We also find a strong and positive effect of past abstention on the inclusion of abstention in 1992 into the choice set. All else equal, those individuals who did not participate in the 1988 elections are less likely to consider voting for any of the candidates and more inclined to abstain in 1992 as well. In terms of partisanship, the results demonstrate that strong Republicans are more likely to include Bush into their choice set and less likely to include Clinton. Strength of Republican identification does not appear to have a reliable impact on the inclusion of Perot and abstention into the choice set. Strong Democrats in turn are less likely to include Bush into their choice sets and more likely to include Clinton (the latter effect, however, is not reliable). They are also less likely to consider Perot and reliably less likely to abstain.

In the choice stage, the economy, health care, and abortion played an important role in selecting Clinton. In terms of Perot, we find that both the economy and abortion seem to have influenced his chances of being selected as the final choice. Surprisingly, the effect of Perot's main campaign issue, the deficit, although large in absolute terms does not seem to produce a reliable effect. However, this is consistent with the findings reported in previous research (Alvarez and Nagler, 1995; Lacy and Burden, 1999). None of the issues appear to have much of an effect on whether a person decided to abstain, given that abstention was in the choice set.

We can bring the estimates into greater relief by computing discrete changes in the predicted probabilities of choosing different alternatives (i.e., we look at discrete change in $\hat{\pi}_q(i)$). In order to do so, we change the value of one predictor from the minimum to the maximum, while holding all other predictors at their original level.

Table 1: Choice Set Logistic Regression Model of Vote Choice in 1992

	Coef	SD	Lower	Upper	Stage
Directional Heuristic	0.54	0.32	-0.09	1.16	1
Not voted in 1988 × Bush	-1.19	0.50	-2.18	-0.21	1
Not voted in 1988 × Clinton	-1.35	0.41	-2.15	-0.54	1
Not voted in 1988 × Perot	-1.00	0.53	-2.03	0.03	1
Not voted in 1988 × Abstain	2.59	0.69	1.25	3.93	1
R Strength × Bush	0.76	0.26	0.26	1.26	1
R Strength × Clinton	-0.76	0.15	-1.05	-0.47	1
R Strength × Perot	-0.68	0.69	-2.04	0.67	1
R Strength × Abstain	-0.28	0.18	-0.62	0.07	1
D Strength × Bush	-0.68	0.13	-0.94	-0.42	1
D Strength × Clinton	0.59	0.48	-0.36	1.54	1
D Strength × Perot	-1.13	0.82	-2.74	0.48	1
D Strength × Abstain	-0.43	0.15	-0.72	-0.14	1
Bush	-0.61	0.33	-1.25	0.03	1
Clinton	-0.04	0.36	-0.75	0.67	1
Perot	1.19	2.82	-4.34	6.71	1
Abstain	-0.58	0.45	-1.46	0.31	1
Economy × Clinton	-1.35	0.48	-2.28	-0.42	2
Economy × Perot	-0.79	0.34	-1.44	-0.13	2
Economy × Abstain	-0.50	0.23	-0.94	-0.06	2
Health Care × Clinton	0.23	0.14	-0.05	0.50	2
Health Care × Perot	0.19	0.13	-0.06	0.44	2
Health Care × Abstain	0.24	0.15	-0.04	0.53	2
Abortion × Clinton	0.98	0.36	0.27	1.68	2
Abortion × Perot	0.86	0.31	0.26	1.46	2
Abortion × Abstain	-0.28	0.23	-0.73	0.16	2
Deficit × Clinton	0.73	0.59	-0.42	1.88	2
Deficit × Perot	1.50	1.03	-0.51	3.51	2
Deficit × Abstain	-1.08	0.86	-2.77	0.60	2
Clinton	-4.37	1.57	-7.43	-1.30	2
Perot	-3.94	1.03	-5.96	-1.93	2
Abstain	-1.00	1.29	-3.53	1.54	2
$N = 2845$					

Notes: Maximum a posteriori probability (MAP) point estimates, along with the corresponding standard deviation and .95 credible interval, shown from a choice set logistic regression. Percent correctly predicted vote choices: 73.96 %. Average probability of correct prediction: 43.80%. The overall predicted vote shares for each alternative are as follows: 24.4% for Bush, 35.6% for Clinton, 17.8% for Perot, and 22.2% favor abstaining. Dividing our model's predicted vote share by the proportion of cast ballots, we see that we slightly underestimate Bush's vote share (31.4% estimated versus 37.5% actual) and slightly overestimate both Clinton's (45.8% estimated versus 43.0% actual) and Perot's vote share (22.8% predicted versus 18.9% actual). All estimates are based on ten imputed datasets.

Table 2: Discrete Changes in Choice Probabilities

		Bush	Clinton	Perot	Abstain
Directional Heuristic:					
Bush	$0 \rightarrow 1$	0.04	-0.01	-0.01	-0.01
Clinton	$0 \rightarrow 1$	-0.01	0.04	-0.02	-0.02
Perot	$0 \rightarrow 1$	-0.01	-0.02	0.04	-0.01
Voted in 1988	$0 \rightarrow 1$	0.03	0.05	0.06	-0.14
Economy	$0 \rightarrow 4$	0.16	-0.17	-0.03	0.04
Health Care	$1 \rightarrow 7$	-0.07	0.02	0.01	0.04
Abortion	$1 \rightarrow 4$	-0.08	0.13	0.10	-0.16
Deficit	$1 \rightarrow 4$	-0.03	0.02	0.10	-0.09

Table 2 shows the discrete changes.[6] The effects of the directional heuristic are relatively mild, as is the effect of past participation (except for the large decrease likelihood of abstaining in 1992). The effects of the economy, deficit, health care, and abortion are much more sizable. Three of these predictors operate in the second stage and are testimony of the importance of systematic processing in electoral behavior.

Implied Choice Sets

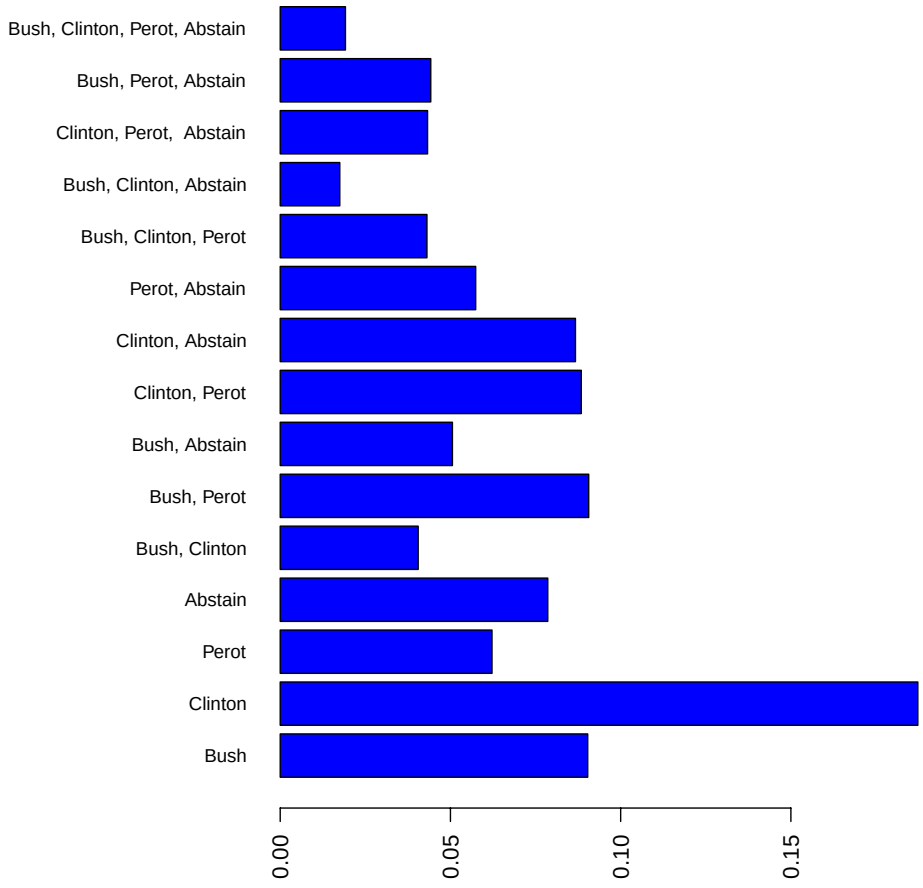
What kind of choice sets do the estimates from Table 1 produce? The answer can be found in Figure 1, which shows the average predicted probabilities for the various choice sets. This probability is greatest for the choice set consisting of Clinton only. But sizable probabilities are attached also to choice sets consisting of Bush and Perot, Clinton and Perot, Bush, and Perot. Choice sets consisting of the two major party candidates are relatively rare, as are those for choice sets consisting of three or all four alternatives.[7]

The high average probability for the choice set Clinton is, suggests that for many Americans it was quite clear who they would vote for by relying on the directional heuristic and their partisan leanings. In 1992, both considerations clearly favored Clinton. It is important to point out that for this segment of the electorate it was not "the economy stupid;" considerations of economic performance only entered the second stage, which became redundant for these voters.

[6] Table 2 provides the changes in predicted probabilities of choosing different alternatives while changing one predictor from its minimum to its maximum value ceteris paribus. Although minimum-maximum changes may not always be entirely realistic, they do provide an excellent insight into the possible range in the data.

[7] The latter point is of some methodological interest. If all respondents had considered all alternatives, then the CSLR model would collapse to a conditional logit model.

Figure 1: Predicted Choice Set Probabilities



Not everyone was so clear from the outset who they would support, however. Two other choice sets are quite prevalent, namely those including Bush and Perot and Clinton and Perot. Here, it is of considerable importance to observe that the likelihood of both choice sets is approximately equal. One can thus say that a direct competition between Bush and Perot was no more (or no less) likely than a direct competition between Clinton and Perot. This is one piece of evidence to suggest that Perot's presence did not disproportionately hurt Bush, as has sometimes been suggested.

Of course, a conclusive answer about Perot's influence would require that we also determine if his chances were disproportionately better in direct competition with Bush than in direct competition with Clinton, or vice versa. There seems little evidence for such a discrepancy, however. Holding all issues at the median, the probability of voting for Perot is about .30 in the Bush-Perot choice set and about .34 in the Clinton-Perot choice set.

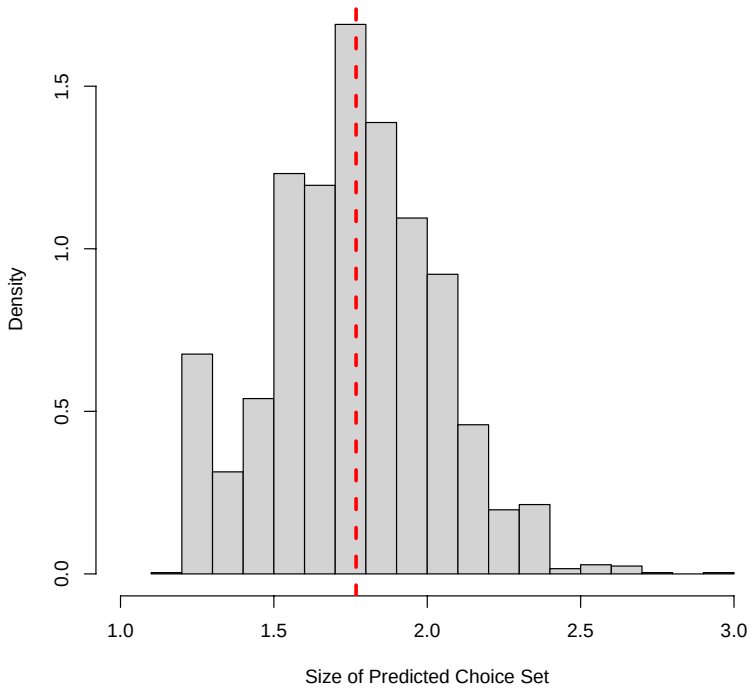
Was Perot more of a competitor with abstention? A choice set consisting of Perot and abstention only is relatively rare and, in this sense, there appear to have been relatively few people who made the election about voting for Perot versus not voting at all[8]. This group would have dropped out had Perot not been in the race but its small size suggests that Perot competed more with Bush and Clinton than with abstention.

For the relatively small group that considered both Bush and Clinton, it can be said that at the median, the issues seem to have slightly favored Bush. That is, given a choice set consisting of Bush and Clinton and median positions on the economy, health care, and abortion, the predicted probability of choosing Bush is about .54 while that for Clinton is .46. While the median response on the economy and abortion clearly helped Clinton, the median respondent was more lukewarm about a government-sponsored health insurance plan. When individuals clearly favored such health insurance, then the broke for Clinton (predicted probability is .76) in a choice set consisting of Bush and Clinton only.

In the final analysis, then, our choice set results suggest that some voters decided by using heuristic processing. These individuals derived sufficient confidence to reduce the choice set to a single alternative. However, many ended up with choice sets consisting of multiple alternatives. Importantly, the number of alternatives left after heuristic processing seems to have been relatively small, on the order of two rather than three or four alternatives. For these individuals, the actual issues of the

[8]Note that the choice set including Perot and abstention is reliably smaller than the choice set consisting of Clinton and abstention.

Figure 2: Average Choice Set Size



election became important to make a final choice. The question is: Who are these people?

Choice Set Size

We conclude our analysis by explaining the size of the estimated choice set. Figure 2 shows the histogram of the average choice set sizes. It clearly shows a limited range over the size of the predicted choice set, to wit 1.2 to 2.9 alternatives. The mean shows that individuals typically considered around 1.8 alternatives.

What determines the average size of the choice set? Table 3 shows the estimates from a Bayesian normal linear regression model with candidate negativity, major party indifference, major party ambivalence, political interest, and political knowledge as predictors. Posterior estimates are reported for a model with a non-informative Jeffreys' prior, which gives results very similar to the OLS solution, with

Table 3: Determinants of Choice Set Size

	Coef	SD	Lower	Upper
Constant	1.82	0.02	1.79	1.85
Major Party Ambivalence	0.06	0.01	0.05	0.07
Major Party Indifference	0.05	0.00	0.05	0.06
Major Party Negativity	-0.01	0.00	-0.01	-0.00
Political Knowledge	0.00	0.00	-0.01	0.01
Political Interest	-0.04	0.00	-0.04	-0.03
$N = 2845$				

Notes: Point estimates, along with the corresponding standard deviation and .95 credible interval, shown from a Bayesian gaussian-linear regression. All estimates are based on ten imputed datasets.

only slightly more uncertainty in the variance term.

The analysis reveals clear effects of three predictors: major party ambivalence, major party indifference, and political interest. As expected, both major party indifference and ambivalence tend to increase the choice set size; interest tends to decrease it. Given the limited observed range of the choice set size, the effects can be considered reasonably large. For example, moving from the minimum to the maximum, indifference is expected to increase the choice set size by .21 units and ambivalence by .40 units. At the same time, shifting across the entire range of political interest is expected to decrease the choice set size by .18 units. We find small but reliable effects for major party negativity, which also decreases choice set size. Finally, we find no effects of political knowledge.[9]

The findings about choice set size are not just of theoretical interest. They also provide strong validation of the CSLR model. If that model is reasonable, we would expect ambivalence and indifference to produce larger choice sets. This is indeed what we find. These results provide a nice ilustration of the validity of the CSLR model. Especially the fact that the different ambivalence and indifference measures are exogenous to the model heightens our confidence using the CSLR model to understand electoral choice behavior.

Conclusion

Choice set models provide an attractive avenue for modeling political choice behavior such as electoral behavior. The idea that voters parse the decision task into

[9]For knowledge, we tried various alternative specifications including nonlinear effects and interactions with other predictors. None of these were statistically reliable.

two parts, one narrowing the universe of alternatives and the other making a final choice, comports well with decision models developed in behavioral economics, and psychology. An important question, however, has always been which predictors should be included in the first and which ones in the second stage of the model. An empiricist approach will not work here. If too many predictors appear in both stages of the model, empirical identification issues are inevitable.

In this study, we have adopted the heuristic-systematic model from social psychology to inform model specification for the two stages. We have argued that the first stage, in which the universe of alternatives is winnowed, relies on heuristics because decision makers will try to minimize effort. Sometimes, these heuristics will actually suggest a clear choice: upon their application, only one alternative remains. Often, they will leave multiple alternatives, which then have to be scrutinized through additional, systematic processing. In the electoral context, we have argued that typical heuristics include party identification, ideology, and past participation habits. We have also argued that systematic processing involves information about contemporary issues, whereas heuristics tend to be relatively abstracted from the present campaign.

Our application focused on the 1992 U.S. presidential elections. This is an interesting case, precisely because the choice set modeling approach allows one to answer a number of interesting questions that have been raised about this election. Specifically, the model provides an alternative to multinomial probit for answering how the presence of Perot influenced other alternatives, including voting for Bush, voting for Clinton, and abstention. In a multinomial probit model, this influence is captured through the correlations between the stochastic components attached to each alternative. In our approach—choice set logistic regression—it is captured via choice sets. For example, we could ask whether it is more likely to consider Bush and Perot together than Clinton and Perot. And given a choice set consisting of say Bush and Perot, which alternative is most likely to be selected?

Our findings reveal a number of interesting patterns. First, quite a few Americans appear to have had choice sets consisting of only one alternative, suggesting that heuristic processing can quickly yield a solution. Among those individuals, Clinton clearly was the favorite candidate. Second, relatively few individuals seem to have considered more than two alternatives, suggesting that heuristic processing indeed narrows down alternatives quickly. Third, among those considering two alternatives, the combinations Bush/Perot and Clinton/Perot were quite common. However, there is no evidence that there was greater competition between Perot and Bush than between Perot and Clinton, as has sometimes been suggested. Moreover,

in direct competition with Perot, Bush was no less likely to be selected than Clinton. Finally, the idea that Perot captured citizens who would otherwise have abstained receives little support. Choice sets consisting of Perot and abstention are not all that common.

That we find evidence for choice sets consisting of multiple alternatives is in itself of interest. Of course, this finding depends in part on our model specification. However, we have opted for a specification that contains key predictors—past participation, party identification, and ideology—which tend to explain a great deal. At least in 1992, the presence of Perot seems to have made the decision more difficult for some people, leading to choice sets consisting of more than one alternative. Those most prone to have expanded choice sets were the indifferent and the ambivalent. Those least prone were the politically interested.

Naturally, this study also has some limitations. One important next issue to explore is to examine the screening process more carefully by making it non-compensatory rather than compensatory. In addition, we could expand the set of considerations entering the second stage of the model, for example by including candidate traits. All of this work provides important and extremely interesting avenues for further research.

This being said, as it stands, we feel that we have demonstrated the importance of transferring basic insights about human decision making from (social) psychology and economics to the study of elections. Our study reveals the utility of choice set models and CSLR for understanding electoral choice. We have demonstrated the importance of distinguishing between a choice set and choice stage by presenting evidence from a US presidential contest with a very strong third-party showing. It goes without saying that our approach will also be very useful for understanding choice behavior in three-party systems, like the United Kingdom for example, or even more fragmented multi-party systems in Western Europe and Latin America. We look forward to future studies applying our method to many more electoral contests in other parts of the world.

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