

## Decision Heuristics as Predictors of Public Choice

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### ABSTRACT

Two studies examined cognitive and affect-based heuristics as predictors of public choice. Participants, recruited before the 2004 Presidential Election, identified the issues that would determine their voting decision and provided ratings of importance and Likelihood of Success for these issues (decision cues) regarding each presidential candidate. Both well-known and new heuristics were evaluated for descriptive fit between predicted and actual voting choices and overall predictive accuracy regarding who the winner of the sample would be. In Study 1, the performance of cue-weight free simple heuristics, particularly those based on frequency counts, matched or outperformed that of normative Franklin's rule that used both cue values and cue weights. In Study 2, the affect (admiration and contempt)-based heuristics performed even better. The Take-The-Best Emotion heuristic performed as well as the affect heuristics utilizing multiple social emotions. These findings highlight the utility of event frequency-based and interpersonal affect-based heuristics in predicting public choice under uncertainty. Copyright © 2007 John Wiley & Sons, Ltd.

**KEY WORDS** cognitive and affect heuristics; public choice; voting decision; presidential election

### INTRODUCTION

This research aims to bridge the study of decision heuristics and the study of public choice. We used presidential election as a realistic platform for examining domain-specific validity and effectiveness of decision heuristics and rules. We took a synthetic approach to studying decision heuristics proposed and developed on different theoretical bases. In the two studies reported in this paper, we compared well-established decision heuristics and explored newly formulated cognitive and affect-based heuristics in terms of their accuracy in capturing the intuition of voters and reflecting voters' choice preference.

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The developments in the fields of human judgment and decision making, public choice, and social emotions shed lights for studying cognitive and affect heuristics that give rise to voting preference. This research integrates and draws inspirations from the following five lines of research.

First, according to Brunswik (1940), cues used in decision making are vicarious predictors of a target variable. These vicarious cues are not equally reliable in different task environments and thus are selected with priority and substituted for each other. Individual decision cues are incomplete predictors of uncertain outcomes, but collectively sufficient for making accurate judgments and decisions.

Second, the search for decision cues in real life is not unlimited and thus cannot be exhaustive. Simon's (1956, 1990) notion of bounded rationality takes into consideration two constraints that shape human decision rationality, namely the limitations of the mind and the structure of the environments in which the mind operates. In his own words, "Human rational behavior is shaped by a scissors whose blades are the structure of task environments and the computational capabilities of the actor" (1990, p. 7). To survive and thrive in the face of risks and uncertainties under time constraints, one is obliged to settle for less than the optimal.

Third, the fast and frugal heuristics program (e.g., Gigerenzer, 2002; Gigerenzer, Todd, & the ABC research group, 1999) combines the Brunswikian tradition of vicarious functioning and Simon's bounded rationality and satisficing (i.e., satisfying and sufficing as opposed to optimizing) heuristics. Gigerenzer et al. suggest that fast and frugal heuristics can be viewed as a set of task domain-specific mental tools that use little information and minimal computation to make judgments and decisions (e.g., one-reason decision making with a specific stopping rule for information search). Simple heuristics often match the performance of information-hungry and/or computationally more complex normative benchmarks such as Bayes theorem, multiple regressions, and Franklin's rule, and may even outperform these benchmarks when outcome uncertainty is high, knowledge is incomplete and/or decision cues are ambiguous or conflicting (see Gigerenzer, 2002; Gigerenzer et al., 1999; Hogarth & Karelaia, in press; Martignon & Hoffrage, 2002; Wang, in press).

Recent studies in political science have also suggested that voters use simple heuristics to make their voting choices. Moreover, more knowledgeable voters but not novices use simple heuristics more frequently in a way that are consistent with their personal interests and preferences (e.g., Lau & Redlawsk, 2001).

In the current study, fast and frugal heuristics were tested against normative decision rules in a new domain of public choice, where public information and knowledge about political candidates or alternative proposals are often limited, conflicting, and unreliable. We argue that the appeal of simple heuristics that rely on only a single or few decision cues (criteria, attributes) should be high for voters of presidential election. While the generalizability of the present findings across elections remains to be tested, we expect that the cognitive and affect-based heuristics tested in the present two studies about one election would capture some common features of public choice under uncertainty. In fact, some previous studies on presidential voting choice have shown that the same decision heuristic predicts presidential election data across multiple elections with comparable accuracies (e.g., Kelley & Mirer, 1974).

Fourth, the current research focused on the roles of evaluative format used in choice heuristics. In several studies of probability judgment, researchers found that the use of frequency format leads to more accurate judgment than probability format and thus reduces or eliminates judgmental errors and decision biases in a variety of situations (see Cosmides & Tooby, 1996; Gigerenzer & Goldstein, 1996; Gigerenzer, 2002; Hoffrage, Lindsey, Hertwig, & Gigerenzer, 2000). In the current research, I compared the voting heuristics relied on Likelihood of Success assessments and those based on frequency counts (e.g., the number of pros or cons associated with each of presidential candidates, or the number of passes or fails in reference to a decision maker's minimum requirements (MRs) for each of the candidates). It needs to be noted that frequency counts and Likelihood of Success are two different evaluative measures rather than different formats (frequency and probability) for presenting equivalent information (e.g., 1 out 100 vs. .01). I predict an advantage of frequency counts over the likelihood estimates due to the robustness of frequency counts in capturing a voter's preference and attitude and its simplicity in evaluating presidential candidates.

Fifth, the present research borrowed ideas from the studies of interpersonal social emotions to examine a set of putative affect-based voting heuristics. I will return to this issue and propose affect heuristics in the section regarding Study 2.

In sum, the two studies reported below examined both normative and simple decision heuristics in a specific task context of presidential election. The studies extended the research on decision heuristics which had largely focused on cognitive heuristics to include affect-based heuristics. I hypothesize that in the context of presidential voting the input format of frequency counts is more reliable than the likelihood assessment due to the high uncertainty in politics and about politicians and limited knowledge concerning presidential issues. For a similar reason, I predict that simple heuristics will match or outperform normative decision rules. In addition, we explore potential functions of affect heuristics in determining presidential choice preference. Social emotions related to group categorization are likely to be used as valid input for choice heuristics in order for people to make rapid judgment and decisions under the routine bombardment of sensory and social information (see also Fiske, 2004). I predict that simple affect heuristics that use holistic social emotions to predict voting choices will match the performance of simple cognitive heuristics and outperform benchmark heuristics such as the Partisan Affiliation heuristic. In addition, affect heuristics relying on one valid social emotion will match the performance of those using multiple social emotions.

### STUDY 1: COGNITIVE HEURISTICS

In a recent paper, Greene (2002) points out that although heuristics such as party identification has had evident success in predicting voting behavior, our common measure of these predictors is surprisingly lacking in theoretical soundness and complexity. The widely used database from the Michigan National Election Studies has been of enormous importance to our understanding of political behavior and promises to continue to be in the future. However, according to Greene, the Michigan measure confounds the empirically and theoretically distinct psychological concepts of attitude and of group identity. The author calls for research with more refined, theoretically based psychological measures of partisanship (p. 172).

Six step-by-step cognitive heuristics were selected and evaluated in Study 1. For each of the proposed heuristics, decision “cues” referred to the issues participants listed as important to determine their presidential choice. The “cue value” was measured by the *Likelihood of Success* rating of “how likely you think that each candidate will successfully implement his policy on this issue.” “Cue weight” was determined by the *Importance* rating of each identified issue. The ratings of *Agreeability* with each of the presidential candidates across the decision issues were used to count the number of pros (the ratings > the neutral point on an 11-point scale) and cons (the ratings < the neutral point) for each candidate.<sup>1</sup> In addition, the MR for each issue was measured for each presidential candidate (“whether Bush’s policy would satisfy your MR for this issue” and “whether Kerry’s policy would satisfy your MR for this issue”). The “+” and “-” signs indicate MR satisfied and MR unsatisfied, respectively. For an illustration of hypothetical data for one particular participant see Table 1.

The six cognitive voting strategies/heuristics<sup>2</sup> were selected based on (1) their popularity in previous studies of decision heuristics and (2) their suitability for voting choice in presidential election.

- (1) Our selection of the normative benchmark in Study 1 is Franklin’s rule (originally advocated by Benjamin Franklin), which is one of the oldest normative decision rules (a linear weight lens model)

<sup>1</sup>The agreeability score itself was not used as cue value in calculations of applicable heuristics because it is basically tautological to voting preference and thus has a ceiling effect on comparisons of voting heuristics.

<sup>2</sup>Of the six voting strategies, Franklin’s rule is not a heuristic but a comprehensive computational rule.

Table 1. An illustration of the table used in Study 1 to gather decision cues (issues), cue weights, cue values, minimum requirements, and likelihood assessments for each of the candidates

Issue number	How strong you feel about it. (1–7 rating)	Agreeability with George W. Bush's policy on issue (–5–5)	Agreeability with John Kerry's policy on issue (–5–5)	Bush (+ or –)	Kerry (+ or –)	Likelihood of Success for George W. Bush (1–9)	Likelihood of Success for John Kerry (1–9)
1	5	3	1	+	+	9	2
2	3	–2	3	–	–	5	7
3	7	5	4	–	+	3	6
<i>n</i>							

Note: This illustration contains hypothetical data for one particular participant.

discussed in decision theories (e.g., Hastie & Dawes, 2001) and examined in practical settings (e.g., Dhami, 2003).

Franklin's rule calculates for each alternative the sum of the cue values multiplied by the corresponding cue weights and selects the alternative with a higher score. For a tie, a random draw would determine who would be chosen. Using Table 1, we would multiply  $(9 \times 5) + (5 \times 3) + (3 \times 7) = 81$  for Bush and  $(2 \times 5) + (7 \times 3) + (6 \times 7) = 73$  for Kerry. Thus, Bush would be the predicted winner for this hypothetical voter.

- (2) Another normative and cognitive measure that has long been used as a decision cue or predictor in both behavioral decision making and management studies is the subjective likelihood assessment (or expectancy) of success (e.g., Savage, 1954; Vroom, 1964). The Likelihood of Success assessment alone can be used as a baseline heuristic. Accordingly, one would choose the candidate who had a higher sum total of likelihood assessment score across the issues. In the case of Table 1, Bush scores 17 points and Kerry scores 15 points. Thus, this hypothetical voter would vote for Bush.
- (3) The simplest and the most commonly used heuristic in the studies of presidential election is perhaps the party affiliation heuristic. Campbell, Converse, Miller, and Stokes (1960) in their seminal book *The American Voter* have shown that voters' attitudes toward presidential candidates indicated by their party affiliation predict their presidential choice with great accuracy. Partisan affiliation heuristic dictates that one votes for the candidate who has the same party affiliation. If party affiliation was other than Democratic Party or Republican Party, the heuristic randomly choose between Bush and Kerry. A limitation of this heuristic is that its predictive power drops to the chance level for the independent voters who are not affiliated with the party of a candidate.
- (4) Another simple voting heuristic tested in Study 1 was selected based on previous studies of actual voting results in presidential elections. This heuristic was named "the voter's decision rule" by Kelley and Mirer (1974). These authors took a data-driven approach to fitting different heuristics to the American National Election Studies data gathered by the Survey Research Center of the University of Michigan. The winning heuristic, selected from a total of 25 postulated decision heuristics, is a combination of a frequency counts-based heuristic and the party affiliation heuristic. In Study 1, we adopted the frequency-counting heuristic and named it the Net Pros-and-Cons heuristic.

According to the Net Pros-and-Cons heuristic, what determines the choice of a voter is the difference in the net score of pros minus cons between the candidates That is,  $[\sum(\text{Bush Pros} - \text{Bush Cons}) - \sum(\text{Kerry Pros} - \text{Kerry Cons})]$ . The pros and cons were measured by the agreeability ratings. The agreeability ratings across the three issues as illustrated in Table 1, shows two pros (positive ratings) and one con (negative rating) for Bush and three pros and zero cons for Kerry. Thus, the heuristic predicts that this hypothetical voter would vote for Kerry.

- (5) Another heuristic was selected from the literature on fast and frugal heuristics (e.g., see Gigerenzer & Goldstein, 1996). A representative fast and frugal heuristic that has gained its reputation in recent years is the Take-The-Best heuristic. In Study 1, the Take-The-Best heuristic looks up the likelihood assessment scores of the issue with the highest cue weight (i.e., the issue a voter feels strongest about), and stops the search if it differentiates choice alternatives (i.e., Bush or Kerry.) If it does not differentiate, the cue with the next highest importance rating is looked at and so on. For a tie, a random draw would determine which candidate would be chosen. Using the example in Table 1, the issue with the highest weight is the third one. For the third issue, Bush scores a 3 while Kerry scores a 6. Kerry would be the predicted winner for this voter.
- (6) Inspired by our previous findings suggesting that MR is a powerful decision reference point in regulating risky choice (see Wang, 1996, 2002) and the studies showing that frequency counts is a privileged format for natural sampling and information processing (e.g., Cosmides & Tooby, 1996; Gigerenzer & Hoffrage, 1995), Study 1 examined a MR-based heuristic. To our knowledge, this is the first time the MR heuristic was proposed and tested. According to the MR heuristic, the voter counts only the number of passes of MRs across the issues in question. The candidate who has a higher number would be chosen. For a tie, a random draw would determine which presidential candidate would be voted for. In the example illustrated in Table 1, Bush receives one plus and two minuses while Kerry receives two pluses and one minus. Thus, the hypothetical voter would vote for Kerry.

Each of the six cognitive heuristics was used to predict voting choices of the participants. Two criteria were used to evaluate these heuristics: (1) Descriptive Fit in terms of percentage of fit between the predicted choices by a heuristic and real choices of the participants at the time when the study took place, (2) Predictive Accuracy in terms of the overall predicted result of the sample (i.e., who would be the winner of this sample and by how much).

## Method of Study 1

### *Participants*

The participants were recruited from three communities in the Midwest of the United States and from a State University in the same region about 2 months before the 2004 Presidential Election. The student participants received extra course credit for participation. The local residents were each paid \$4 for participation.

A total of 140 volunteers (63 men and 77 women) participated in the study.<sup>3</sup> They averaged 31.0 years of age.

### *Materials and procedure*

As described previously and illustrated by Table 1, we adopted a new method where participants generated their own list of any issues that were important to them. The participants were first asked to list and describe in writing their most concerned issues that would determine their election decision. These self-generated issues were then labeled by numbers in a structured questionnaire table in which the participant would rate one issue at a time, for each of the two presidential candidates, on the following scales (1) the importance of an issue, (2) the agreeability rating regarding each candidate's policy on the issue, (3) MR satisfaction or dissatisfaction rating, and (4) Likelihood of Success assessment (see Table 1, for the application of a similar method in studies of risk perception see Fischer, Morgan, Fischhoff, Nair, & Lave, 1991).

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<sup>3</sup>One participant, who had an indifferent preference for the presidential candidates, was excluded from the data analysis.

Upon completion of the ratings, the participants were asked to vote as if the presidential election were held that day. They also indicated using a percentage between 0 and 100, how likely they would vote for President Bush and for Senator Kerry. Finally, the participants provided party affiliation information (Democrat, Republican, or Other) regarding their parents and themselves.

### Results and discussion of Study 1

In this sample, 58 (41.4%) of the participants voted for Bush, 82 (58.6%) voted for Kerry.<sup>4</sup> It is noteworthy that this choice pattern was consistent with the real election result [45% (2692) for Bush and 55% (3315) for Kerry] of the same county, where this sample was collected.

The choice patterns of the students and local residents showed no difference and thus were analyzed together as one sample.

#### *Performance of different heuristics*

The following list shows the average descriptive fit measures of the six heuristics, using the Likelihood of Success alone as a baseline.<sup>5</sup> Likelihood of Success alone (67.2%), Franklin's rule (72.6%), Take-The-Best heuristic (72.6%), Partisan Affiliation heuristic (76.7%), MR heuristic (83.6%), and Net Pros-and-Cons heuristic (87.7%).

The overall distribution with respect to the descriptive fit of the six heuristics was significantly different from a uniform distribution, ( $\chi^2 = 17.97$ ,  $p < .003$ ). Further analyses showed that the MR heuristic and the Net Pros-and-Cons heuristic significantly improved the descriptive fit compared to the baseline of Likelihood of Success alone, ( $\chi^2 = 6.39$ ,  $p < .011$  and  $\chi^2 = 14.40$ ,  $p < .001$ , respectively).

Using the real choice percentages of the sample (41.0% for Bush and 59.0% for Kerry) as the reference, the predictive accuracies of the six heuristics are as follows:

(1) The Likelihood of Success alone was incorrect. It predicted a 55.7% for Bush and 44.3% for Kerry voting pattern. In fact, Kerry was the winner of the voting sample; (2) The Partisan Affiliation heuristic was accurate. The predicted percentage for the winner and the real percentage differed only by 1.9% (42.9% for Bush and 57.1% for Kerry); (3) The Franklin's rule was incorrect. It predicted a 54.7% for Bush and 45.3% for Kerry voting pattern; (4) The Net Pros-and-Cons heuristic was correct with a 2.4% difference. It predicted a 38.6% for Bush and 61.4% for Kerry voting pattern; (5) The Take-The-Best heuristic's overall prediction of the winner (59.8% for Bush and 40.2% for Kerry) was incorrect compared to the real percentages of the sample; and (6) The MR heuristic correctly predicted the overall winner (37.2% for Bush and 62.8% for Kerry) with a 3.8% difference, compared to the real result of the sample.

#### *A parental party affiliation effect*

Both mother's party affiliation and father's party affiliation significantly influenced voting preference. Interestingly, father's party affiliation showed a greater influence on voting preference ( $\chi^2 = 22.06$ ,  $p < .0001$ ) than mother's party affiliation, ( $\chi^2 = 8.88$ ,  $p < .012$ ).

<sup>4</sup>Of the 140 participants, 4 did not provide the dichotomous vote for either Bush or Kerry. For these participants the choice was inferred from the difference between the two continuous measures of the Likelihood of Voting for Bush and Likelihood of Voting for Kerry.

<sup>5</sup>Participants who did not agree with a policy rated the Likelihood of Success of the policy lower than those who agreed with the policy. Pearson correlation analysis showed that the Likelihood of Voting for Bush was positively correlated with the overall Likelihood of Success for Bush policies (0.316,  $p < .01$ ) but negatively correlated with the overall Likelihood of Success for Kerry policies ( $-0.526$ ,  $p < .01$ ). In contrast, the Likelihood of Voting for Kerry was positively correlated with the overall Likelihood of Success for Kerry policies (0.641,  $p < .01$ ) but negatively correlated with the overall Likelihood of Success for Bush policies ( $-0.296$ ,  $p < .01$ ).

The father's party affiliation on daughter's voting choice was very significant ( $\chi^2 = 15.30, p < .0001$ ) whereas the mother's party affiliation had only a marginal influence ( $\chi^2 = 5.78, p < .055$ ). Similarly, the influence of the father's party affiliation on son's voting choice was significant ( $\chi^2 = 7.57, p < .023$ ) whereas the effect of mother's party affiliation was marginal ( $\chi^2 = 5.73, p < .057$ ).

In the 26 cases where the father and mother had different party affiliations, 16 votes (62%) were consistent with the father's party affiliation and 10 votes (38%) were consistent with the mother's party affiliation.

#### *What have we learned so far?*

Overall, the simple heuristics either matched or outperformed the normative heuristic (i.e., Franklin's rule). Second, the simple heuristics that used frequency counts rather than likelihood assessment performed even better.

The two heuristics that rely on simple frequency counts (i.e., the MR heuristics and the Net Pros-and-Cons heuristic) significantly improved the descriptive fit and outperformed the normative Franklin's rule that use both cue values and cue weights, which was not significantly higher than the descriptive fit of the baseline heuristic of Likelihood of Success alone. Frequency counts-based heuristics are not only cue-weight free but also cue-value free.

The MR heuristic is a satisficing principle (Simon, 1956, 1990) which uses issue-related MRs as reference points and counts only passes or fails. The Net Pros-and-Cons heuristic also relies on simple frequency counts but is computationally a little more complex than the MR heuristic.

The Take-The-Best heuristic matched the performance of the normative Franklin's rule in its descriptive fit but incorrectly predicted the overall winner of the sample. Since the sum value of Likelihood of Success assessment did not accurately reflect the overall presidential preference of the sample, the heuristics that relied on this cognitive measure would fail to accurately predict the overall winner of the sample.

The popular partisan identification heuristic did only moderately well in regard of its descriptive fit, and also correctly predicted the overall winner of the sample. This is a one-reason decision rule which takes into consideration a single cue (party affiliation). The validity of party affiliation in predicting public choice of the presidential candidates lies in part in its strength in reflecting personal political attitude and long-term social group identification. However, the application of this heuristic is largely limited to only these voters who had clear and strong attitude toward presidential candidates.

An auxiliary and interesting finding regarding party affiliation is that the political party affiliation of the fathers of the participants was a better predictor of the voting preference of the participants than the party affiliation of the mothers.

## STUDY 2: AFFECT-BASED HEURISTICS

Over the last 10 years, there has been a growing interest in constructive roles of emotions in decision making under risk or uncertainty (e.g., Elster, 1996, 1998; Lerner, Gonzalez, Small, & Fischhoff, 2003; Loewenstein, Hsee, Weber, & Welch, 2001). Mellers, Schwartz, and Ritov (1999) demonstrated that people anticipate how they will feel about the outcomes of decisions and use their predictions to guide choice. Slovic, Finucane, Peters, and MacGregor (2002) have provided empirical evidence that people not only rely on feelings but also use affective reactions as heuristics for making risky choices. Pham, Cohen, Pracejus, and Hughes (2001) showed that people make faster and more consistent evaluative judgments by monitoring their feelings toward the target than relying on cold, reason-based assessments. Wang (2006) provided some empirical evidence of separable as well as joint effects of cognitive and emotional preferences on hypothetical risky choices.

In political science, affective cues and cognitive cues have also been found to have differential effects on voter judgment and choice (e.g., Christ, 1985; Granberg & Brown, 1989; Marcus, 2000; Ragsdale, 1991) and evaluations of leaders (Jones & Iacobucci, 1990). Ragsdale (1991) highlights three central properties of

emotional reactions to public figures or events. First, emotions are often more basic aspects of an experience than cognitive gathering and processing of information. Citizens have relatively little interest in gathering and, more important, weighing information on any political occurrence. Second, an emotion-induced impression toward a person or event is more long lasting than a cognitive impression of a person or event. Finally, emotions are often a more accurate measure of people's responses to a situation than is their cognitive processing of information. Emotions may reveal voters' preference even when the voters are undetermined.

Schwarz and Clore (1983; see also Clore, Gasper, & Garvin, 2001; Wyer & Carlston, 1979; Wyer, Clore, & Isbell, 1999) have long argued that affective states serve as information for making judgments and for forming attitudes. Clore, Schwarz, and Conway (1994) as well as Petty, Schumann, Richman, and Strathman (1993) assumed that people use affect as information when they lack the ability and motivation to think about the issues being considered. People may consider affect when they are unable or unwilling to process more complex information, such as the arguments contained in the persuasive message (see Petty & Wegener, 1999). In general, individuals may make judgments of any target by assessing their concurrent feelings and using those feelings as a basis for their attitudes (Wyer et al., 1999).

In the context of presidential election, holistic affect heuristics based on some social group-specific emotions may better capture presidential preference of the voters than analytical cognitive heuristics. People apply to political figures the affective tag of "we-group (in-group)" or "they-group (out-group)." Group affect becomes a reliable heuristic of wide political application (Brady & Sniderman, 1985).

Social psychology studies have identified two core dimensions of interpersonal perception and inter-group behavior: perceived warmth and competence of the target person. Fiske and her colleagues (e.g., Fiske, Cuddy, & Glick, 2002; Fiske, Cuddy, Glick, & Xu, 2002; Fiske & Pavelchak, 1986) map onto the warmth by competence space four clusters of interpersonal emotions: admiration (high warmth and high competence), contempt (low warmth and low competence), envy (low warmth and high competence), and pity (high warmth and low competence). These authors view admiration and pity as in-group emotions and contempt and envy as out-group emotions.<sup>6</sup>

In Study 2, the same four sets of emotions were measured to reflect voters' social perception and emotional reactions to the presidential candidates. I hypothesize that these interpersonal social emotions are used as input to affect heuristics in making presidential choice. Following these affect heuristics, voters would prefer a candidate if they experience high in-group emotions or low out-group emotions toward the candidate. These affect measures are expected to be more reliable than analytical assessments due to their holistic nature. Affect measures are also expected to be more parsimonious than cognitive assessments since they integrate both cue values and cue weights. To our knowledge, it is the first time interpersonal social affects are tested as choice heuristics to predict voting behavior.

Second, I predict that simple affect heuristics which rely on the most valid social affect (Take-The-Best Emotion heuristic) will match the predictive power of more complex affect heuristics which take into consideration all four interpersonal social emotions. This prediction is based on the following assumptions. First, valid social emotions such as admiration and contempt may be redundant in predicting group identification and interpersonal preferences. Second, a less valid social emotion (e.g., pity) can create noise or generate choice preference inconsistent with that activated by other social emotions.

## **Method of Study 2**

### *Participants*

The participants were students recruited from a University in the Midwest of the United States about 2 months before the 2004 Presidential Election. A total of 70 volunteers (26 men and 44 women) participated

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<sup>6</sup>While admiration and contempt are largely restricted to in-group and out-group situations, respectively, pity and envy are more likely to be felt in both in-group and out-group situations. Due to a less clear social group-boundary, pity and envy-based affect heuristics may not be as accurate as admiration or contempt-based heuristics in predicting voting preference.

in the study. The average age of the participants was 24.9 years. The students received extra course credit for participation.

### Materials and procedure

The participants were asked to rate on a 5-point scale their emotional reactions to the presidential candidates Bush and Kerry. The questionnaire was adopted from Fiske, Cuddy, and Glick (2002) and Fiske, Cuddy, Glick, and Xu, (2002). Accordingly, the ratings of specific items were averaged into four sets of interpersonal emotions: admiration (admiring, fond, inspired, proud, and respectful), contempt (angry, ashamed, contemptuous, disgusted, frustrated, hateful, resentful, and uneasy), envy (envious and jealous), and pity (pity and sympathetic). The order of the emotional ratings for Bush and Kerry was counter-balanced.

Upon completion of the ratings, the participants were asked to vote as if the presidential election were held that day. They also indicated using a percentage between 0 and 100, how likely they would vote for Bush and Kerry. Finally, the participants provided their party affiliation information (Democrat, Republican, or Other).

### Results and discussion of Study 2

In this sample, 26 (37.1%) voted for Bush, 44 (62.9%) voted for Kerry. Table 2 shows the correlations between the subjective probabilities of voting for Bush and Kerry and the social group emotions. Table 3 shows the correlations between the four types of emotional reactions to Bush and Kerry. Table 4 shows the emotional profile of the voters.

Of the four types of interpersonal emotion, admiration, contempt, and pity were significantly correlated with the subjective probability of voting for a candidate, with a correlation averaged across both candidates of .612, -.610, and .403, respectively. As shown in Table 4, the Bush voters were high in in-group emotions (admiration and pity) for Bush and low in out-group emotions (contempt and envy) toward Bush, and visa versa for Kerry. In contrast, the Kerry voters scored high in in-group emotions for Kerry and low in out-group emotions toward Kerry, and visa versa for Bush.

This analysis showed that the most valid emotion in predicting presidential choice preference was admiration, followed by contempt and pity.

### Performance of the affect heuristics

(1) The Take-The-Best Emotion (Net Admiration) heuristic used the most valid emotion (thus the admiration score) and voted for the candidate who had a higher admiration score. For ties, it randomly chose a candidate.

This affect heuristic had an average descriptive fit of 90.9%. It predicted the winner of the sample correctly (39.4% for Bush and 60.6% for Kerry) with a 2.3% difference from the real voting result of the sample.

Table 2. Correlations between four types of interpersonal emotions and the subjective probability of voting (SP vote) for Bush or Kerry ( $n = 70$ )

SP vote		Bush admiration	Bush contempt	Bush envy	Bush pity	Kerry admiration	Kerry contempt	Kerry envy	Kerry pity
Bush	Pearson correlation	.684**	-.682**	-.047	.555**	-.457**	.524**	.178	-.198
	Sig. (one-tailed)	.000	.000	.349	.000	.000	.000	.070	.050
Kerry	Pearson correlation	-.572**	.641**	.041	-.502**	.544**	-.538**	-.132	.251*
	Sig. (one-tailed)	.000	.000	.367	.000	.000	.000	.138	.018

\*Correlation was significant at the .05 level.

\*\*Correlation was significant at the .01 level.

Table 3. Pearson correlations between the four types of emotional reactions to Bush and Kerry

	Bush admiration	Bush contempt	Bush envy	Bush pity	Kerry admiration	Kerry contempt	Kerry envy	Kerry pity
Bush admiration	1	-.454**	.340**	.613**	-.121	.578**	.430**	.107
Bush contempt	-.454**	1	.136	-.373**	.427**	-.214*	.045	.381**
Bush envy	.340**	.136	1	.296**	.189	.253*	.421**	.306**
Bush pity	.613**	-.373**	.296**	1	-.244*	.555**	.393**	.225*
Kerry admiration	-.121	.427**	.189	-.244*	1	-.510**	.092	.382**
Kerry contempt	.578**	-.214*	.253*	.555**	-.510**	1	.496**	.105
Kerry envy	.430**	.045	.421**	.393**	.092	.496**	1	.333**
Kerry pity	.107	.381**	.306**	.225*	.382**	.105	.333**	1

\*Correlation is significant at the .05 level (one-tailed).

\*\*Correlation is significant at the .01 level (one-tailed).

- (2) The Net Contempt heuristic voted for the one with a lower contempt score.<sup>7</sup> It had an average descriptive fit of 89.6%. Its overall prediction of the winner (34.3% for Bush and 65.7% for Kerry) was correct with a 2.8% difference.
- (3) The Net Pity heuristic voted for the candidate who received a higher pity score. This affect heuristic had an average descriptive fit of 81.1%. Its overall prediction of the winner (52.8% for Bush and 47.2% for Kerry) was incorrect compared to the real winner of the sample.
- (4) The Sum of Emotions heuristic voted for the candidate who had a higher average of (admiration score – contempt score + pity score). It had an average descriptive fit of 91.1%. Its overall prediction of the winner (38.8% for Bush and 61.2% for Kerry) was correct with a 1.7% difference.
- (5) The Partisan Affiliation heuristic was used as a benchmark heuristic. The same as Study 1, the heuristic chose the candidate whose party affiliation was the same as the voter. In case of a tie, a candidate was randomly chosen. This heuristic had a lower descriptive fit of 71.4%. Although the overall prediction of the winner was in the correct direction, the percentages were off the mark. The predicted overall voting percentages (48.6% for Bush and 51.4% for Kerry) differed from the real percentages of the sample by 11.5%.

Table 4. Emotional profiles of Bush (B) voters, and Kerry (K) voters

	Admiration**	Contempt**	Envy	Pity*
Bush (B-voters)	3.08 ± .63	1.68 ± .54	1.29 ± .51	2.50 ± .80
Bush (K-voters)	1.96 ± .67	2.96 ± .87	1.44 ± .81	1.72 ± .67
Bush (overall)	2.38 ± .85	2.49 ± .98	1.39 ± .71	2.00 ± .80
Kerry (K-voters)	3.05 ± .88	1.62 ± .71	1.35 ± .66	2.08 ± .83
Kerry (B-voters)	2.11 ± .79	2.60 ± 1.0	1.52 ± .94	1.67 ± .60
Kerry (overall)	2.69 ± .95	1.98 ± .95	1.42 ± .77	1.93 ± .77

$n = 70$  (26 Bush voters and 44 Kerry voters).

\*The difference between the Bush voters and Kerry voters was significant at the .05 level.

\*\*The difference between the Bush voters and Kerry voters was significant at the .01 level.

<sup>7</sup>Note that this heuristic can be seen as another Take-The-Best Emotion heuristic given that the admiration and contempt scores had very similar scores of correlation with the voting probability measures.

In sum, the affect heuristics based on two of the proposed social emotions, namely admiration and contempt, did extremely well in predicting voters' preference in terms of both descriptive fit and predictive accuracy of the overall winner of the sample. Chi-square analyses showed that all the affect heuristics had a significantly higher descriptive fit compared to the Partisan Affiliation heuristic, at  $p < .001$  level. Although direct comparison across Study 1 and Study 2 may not be appropriate, the overall result indicates that affect-based heuristics better predicted the participants' choice preference for presidential candidates than the cognitive heuristics. As predicted, the Take-The-Best Emotion heuristic performed as well as the computationally more complex the Sum of Emotions heuristic.

## CONCLUSIONS, IMPLICATIONS, AND LIMITATIONS

In Study 1, simple heuristics such as Take-The-Best matched the performance of the normative Franklin's rule, and improved average descriptive fit to the real voting choices of the sample from the baseline level of 67–73%. Moreover, the format of input to heuristics appeared to be another significant factor. The heuristics using frequency counts (e.g., the number of pros vs. number of cons, the number of MR passes) showed an additional improvement in descriptive fit (up to 88%) over the heuristics using Likelihood of Success assessment. The good performance of the frequency counts-based and reference points-defined simple heuristics highlights the effectiveness of cue-value and cue-weight free simple heuristics in predicting public choice under uncertainty and suggests that some forms of these heuristics are actually used by real voters.

In Study 2, the affect heuristics based on few interpersonal social emotions did remarkably well regarding both evaluation criteria (descriptive fit and overall predictive accuracy). The affect heuristics based on two of the four proposed social emotions (admiration and contempt) significantly outperformed the benchmark Partisan Affiliation heuristic in their descriptive fit as well as in their accuracy in predicting the overall winner of the sample. The two social emotions capture some key features of public perception of inter-group relationship and voters' attitude toward political figures in the task context of presidential election.

These domain-specific social emotions appear to be valid constructs of voters' social rationality. Their holistic property fits well with the minds of ordinary voters, characterized by incomplete knowledge and limited motivation. Although normative heuristics and decision aids may be used to minimize emotional influences on experts and policy makers, social emotions are inevitably essential in determining ordinary people's attitude toward and evaluation of public figures, political messages, and managerial proposals.

The performance of simple affect heuristics, particularly the Take-The-Best-Emotion heuristic was as well as the performance of the computationally more complex Sum of Emotions heuristic. This result suggests that although emotions in reaction to public events may be rich and voluminous, choice preference can be largely determined by only one or few emotions that are most valid in the task context. Voters as consumers of social messages and political ideology react to public choice options with prioritized social emotions.

The results of the two studies provide a new empirical framework for studying heuristic mechanisms of public choice and offer implications for government and political organizations regarding campaign management. However, given the relative small size of the samples and homogeneity of the participants, we need to be cautious about possible implications and generality of the present findings.

In addition, it needs to be noted that the relationship between choice heuristics and voting decisions is correlational not necessarily casual. Even if a particular heuristic yields a very good fit to voting data, we cannot conclude that voters have made their voting decisions based on this heuristic.

The present studies examined cognitive heuristics and affect-based heuristics in two different samples and thus cannot directly compare the effects of the two types of heuristics on voting behavior. Future research adopting a within-subject design would be able to address the interesting question regarding the extent to which voting behavior is determined by cognitive or by affective factors.

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