When Candidates Attack:

Who Goes Negative and Why It Works

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Abstract

Political candidates use a variety of negative campaigning strategies, and these attacks have different degrees of success. To explain this, I first introduce a formal model of campaign strategy to show when candidates will engage in negative campaigning and how it can affect election results. Whether candidates choose negative campaigning depends upon three factors: the voters' preconceptions about political candidates, the voters' preferred dimension, and the candidates' character traits. I show that eliminating negative campaigning has an ambiguous effect on voter welfare. Then, I extend the formal model of campaigning to include situations in which candidates campaign dishonestly. I find that allowing this is strictly inferior for voter welfare. Often this is because whenever lying becomes more probable, all campaigns start to look the same.

In order to understand the implications of the formal model, I use multiple empirical testing methods. I use laboratory experiments to test how voter beliefs and voter behavior affect the frequency and content of candidates' negative campaigning. I find support for the above comparative statics hypothesis about when candidates are more likely to negatively campaign. Furthermore, the laboratory results are better explained by a quantal response equilibrium model in which voters are risk averse and are more naïve than sophisticated in their Bayesian updating ability.

I next consider how negative campaigning translates into votes. From survey responses, I show empirical support for candidate tactics that target specific segments of voters based upon their predilections toward accepting negativity in campaigns. One way candidates attack their rivals is by trying to make voters afraid of them. From a laboratory experiment in which subjects made social judgments about pairs of candidates who ran against each other in real elections, we found that the candidates chosen by subjects as more physically threatening had actually lost 65%

of the real elections. Such correlation could arise from common neural mechanisms engaged when viewers make social judgments about faces, and when voters evaluate candidates. This was shown in two independent fMRI studies in which subjects again made judgments about images of unfamiliar politicians who had run in real elections. We found that for judgments of threat, election loss correlated with activity in the insula and ventral anterior cingulate cortex, structures known to be involved in processing negative emotions. These findings suggest that voters are influenced by negative emotions elicited by a candidate's mere appearance.

Finally, we examine the role of candidate fear in explaining voter choice in presidential elections using ANES data from 1980–2004. We find that certain groups of voters are more susceptible to fear appeals. After controlling for the factors commonly thought to affect voter decision-making, we also find further evidence that fear of presidential candidates directly affects vote choice. The results have implications for future research on negative political communication, as they suggest that threatening first impressions can harm a candidate's electoral chances. They also show that candidates who wish to successfully utilize negative campaigning must tailor their campaigns not only to reflect the weaknesses of the opponent but also to insure that their message is salient to the specific group of targeted voters.

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Chapter 1

Introduction

Although few campaign strategies are as maligned as negative campaigning, that hardly changes the fact that negative campaigns—or at least charges of negative campaigning—are ubiquitous. A recent article in the *Washington Post* (Grunwald 2006) stated that the National Republican Campaign Committee was dedicating over 90% of its campaign budget to negative advertising. But if nearly all campaigning is classified as "negative", how meaningful is this term for describing political communication? Certainly not every politician uses the same strategy, a simple fact obscured by statements such as that by the *Post*. If the conventional approach used to classify advertising puts 90% in the same category, we need a better method of classifying campaign styles. Perhaps conveniently, candidates accusing their opponents of negative campaigning use a different definition than candidates employing such criticism (Maisel et al. 2007). "Negative campaigning is vicious personal attacks," said House candidate Paul Nelson in the aforementioned Washington Post article. Nelson's campaigning easily met his definition of negative when he targeted his opponent in a television ad stating "Representative Ron Kind pays for sex" while showing a picture of Kind with "XXX" stamped across his face (Grunwald 2006). This type of attack is very different from pointing out the shortcomings of an opponent's health care reform plan. Clearly, not all negatively toned advertising is the same.

Nevertheless, "negative campaigning" is often maligned in general, often due to the perceived falseness or triviality of the attack. Take this advertisement, for example:

> "State Representative Randy Graf hung a picture of President Bush in [Graf's] office upside-down, because he *disagrees* with him! Graf's actions are disrespectful and wrong, especially in a time of war. *Randy Graf* has it upside-down. Congressman Jim Kolbe proudly hangs the President's picture in his

> office right-side up. President Bush endorses Kolbe because he is dedicated to the fight for freedom and lower taxes." (Jamestown Associates 2004)

Here, Kolbe insinuates that his opponent Randy Graf is a traitor and bases this accusation upon Graf's inappropriate handling of a photograph. While potentially engaging for staunch Bush or Kolbe supporters, the advertisement probably comes off as specious character assassination to many others. Advertisements of this sort tend to devalue political attacks in general, causing candidates who engage in negative campaigning to be labeled as manipulators who are discouraging voter participation (Nelson, Dulio, and Medvic 2002). It is not uncommon to hear that "in overwhelming numbers, people say that negative campaigning is wrong and is damaging to our democracy"(Carr 2002).[1] The leaders of the Anglican Church have called for an end to negative campaigning (Watt 2001), and political candidates have also ventured to state their opposition directly. For example, Kathleen Brown, in the 1994 California gubernatorial race, implored all candidates to sign her proposal to "run a different kind of campaign. No negative ads bashing your opponent, but instead an election about the issues" (Stanford PCL 2006). Would political discourse really be better off without negative campaigning?

As explained by Geer (2006), negativity can improve the information received by voters. Moreover, impressions formed on the basis of negative information tend to be more lasting and more resistant to change (Cobb and Kuklinski 1997). As character is an important aspect of politics, character assaults have been prominent in politics throughout the history of the United States. For example, John Adams' supporters accused Thomas Jefferson of being an atheist, the Van Buren campaign attempted but failed to brand William Henry Harrison as broken-down and incompetent, and proponents of James Blaine mocked Grover Cleveland's admitted infidelity (Ferling 2004; Cleaves 1939; Troy 1996).

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[1] Carr (2002) is quoting Kathryn Hunt of the University of Maine's Margaret Chase Smith Center for Public Policy.

However, if negativity generally has deleterious effects on election outcomes, that would bolster arguments in favor of its reduction or elimination.[2] So, in order to assess the critiques of negative campaigning, one must ask: Who goes negative, when do they go negative, and how does it work?

What is Negative Campaigning?

In order to answer these questions, we need a formal definition of negative campaigning. It should capture the fundamental aspects that make campaign themes negative and also allow for easy comparison with other campaign styles. Not all attacks are the same. Surveys show that voters can differentiate between attacks on an opponent's personal life and attacks on policy issues, and perceive attacks on a candidate's personal qualities as more negative than issue attacks (Jamieson 2000). Popkin (1991) argues that voters use personal information about a candidate as a proxy for information that is otherwise difficult to obtain—specifically, evidence regarding how that candidate might behave in office.

Thus, the definition of negative campaigning should not only distinguish between promoting oneself and attacking the opponent but also separate campaigning on political issues from campaigning on character traits. Political issues, such as gun control and abortion, are generally represented by a left-right continuum (Poole and Rosenthal 1985). Character issues, such as honesty, competence, and leadership ability, are more typically represented by a valence dimension. This distinction is important but certainly not a recent innovation; for example, it has long been recognized that the perceived character of politicians affects their ability to persuade the voters.[3] A valence dimension measures an attribute on which all voters have the same

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[2] In some countries, such a ban may be possible in practice. With the stated goal of protecting the reputation of the candidates and political parties, a recent political reform in Mexico has made negative campaigning advertising illegal (Serra 2008).

[3] Aristotle, in the Rhetoric, (Book 1, Chapter 2) argued that "of the modes of persuasion furnished by the spoken word there are three kinds. The first kind depends on the personal character of the speaker; the

preferences, generally preferring more to less (or vice versa). Adding a valence dimension to definitions of campaign discourse provides a simple means of separating political issues, on which voters have varied opinions, from character traits, about which voters' preferences essentially agree. Stokes (1992) shows that both left-right and valence dimensions are needed to accurately represent voters' preferences. A framework with two dimensions and two candidates suggests four campaign possibilities. The following matrix delineates each campaign type:

Table 1: Four Campaign Types

	Issue Dimension	**Character Dimension**
Talk about one's opponent	Issue Differentiation	Negative Campaigning
Talk about oneself	Issue Bolstering	Positive Campaigning

Each of the four main cells in Table 1 represents a different campaign strategy. As the table shows, I specifically define *negative campaigning* as campaigning against an opponent on the character dimension. A good example of this is Charles Shumer's recurring theme, "Al D'Amato. Too many lies for too long," which appeared in many of Shumer's spots during his 1998 Senate campaign against D'Amato (Smith 1998). Notice that, in this framework, negative issue campaigning (i.e., stating that an opponent has the wrong stance on political issues) is referred to as *issue differentiation*, which is a separate campaign strategy from negative character campaigning. This is because negative issue campaigning, while it may be caustic in tone, does not directly impugn character. Most common in the issue differentiation category are contrast ads, which highlight the weaknesses of an opponent's policy position by offering a comparison of the candidates' issue stances. Also shown in Table 1 are the two self-promotional campaign

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second on putting the audience into a certain frame of mind; the third on the proof, or apparent proof, provided by the words of the speech itself." (Aristotle, ed. Honeycutt 2004).

types. Highlighting one's own valence qualities is defined as *positive campaigning*, and promoting one's own ideological positions is *issue bolstering*.

This framework helps to better understand campaign discourse. For example, in the 2005 Los Angeles Mayoral Race between James Hahn and Antonio Villaraigosa, the candidates held similar issue positions, so instead battled over character – who was less corrupt, and who was more trustworthy. Villaraigosa's negative advertising alleged Hahn's involvement in trading city contracts for campaign donations. Meanwhile, Hahn's commercials connected Villaraigosa to both corporate scandal and street gangs. "Los Angeles just can't trust Antonio Villaraigosa," one Hahn commercial stated (Blood 2005).

Of course, most political advertisements are not confined to a single dimension, but instead combine various themes. For example, the Kolbe ad above combines character attacks on Graf with a non-sequitur about Kolbe's stand on taxation. Things get even more complicated when a candidate uses an opponent's issue positions to make a statement about his character, such as labeling an opponent a waffler or flip-flopper. One example of this is the "windsurfing" advertisement that the Bush campaign used against John Kerry, which disparaged Kerry's character by claiming that he had both supported and opposed the Iraq war, education reform, and increasing Medicare premiums.[4] Another example occurred in California Congressional District 26, when Cynthia Matthews used her opponent's David Dreier's political record to insinuate that he has major character flaws. Matthews, openly homosexual, accused Dreier of being a closeted homosexual and therefore a hypocrite because he consistently voted against gay issues. "If David Dreier is gay, it is absolutely shameful to me that he would amass a 24-year voting record against his own community," she stated.[5]

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[4] To view this advertisement, see "The Living Room Candidate: Presidential Campaign Commercials, 1952-2004", http://livingroomcandidate.movingimage.us/index.php.
[5] Source: http://www.gayrightswatch.com.

Previously, scholars (e.g., Geer 2006) who have coded the content of advertisements for empirical research have quite reasonably tended to look at discrete advertisements as points of analysis, because their studies have generally focused on evaluating the content of or gauging voter response to those campaign advertisements. In contrast, the conditions that make a candidate more likely to choose negative campaigning in the first place are understudied. Since I'm looking at the reasons why candidates initially choose their strategies, I focus instead on overall campaign themes. Because political commercials can incorporate many themes, it is better to look at the array of advertisements offered by a campaign before determining the candidate's political strategy; one negative comment does not necessarily constitute a negative strategy. This framework is intended to capture the overarching themes that appear in multiple campaign advertisements, and it is these themes which can be categorized into specific dimensions and campaign types.

Other Approaches to Negative Campaigning

Campaign observers, as West (1993) explains, often "define negativity as anything they do not like about campaigns." For example, some make the error of evaluating the veracity of the advertising to determine its negativity.[6] While the truth of the statements contained within the ads is clearly important, it is a separate issue from the style of the campaign. Nearly everyone is in agreement that campaign strategies involving calumny can harm the political system. However, not all negative campaigning is mendacious, nor are all lies negative campaigning. Candidates can just as easily lie (or stretch the truth) about themselves as they can present misinformation about their opponents. Furthermore, Davis and Ferrantino (1996) postulate that candidates run less risk of being caught if they lie about the opponent rather than exaggerate the benefits they will provide if elected. This is because campaign promises can be used against a

[6] For further explanation in support of this argument, see Lau and Pomper (2002) and Mayer (1996).

candidate in future elections, while it is impossible to invalidate claims of what the opposing candidate would have done if elected.

Formal studies of negative campaigning have not adequately addressed the fundamental distinction between issue and character campaigning in their definition of the term. In Harrington and Hess (1996), though candidates inherit initial locations on both a valence and an issue dimension, they are restricted to campaigning on the issue dimension, where negative campaigning consists solely of relocating the opponent on that dimension. Hinich and Munger (1989) assume that candidates use negative campaigning to increase the variance of their opponent's policy, and positive campaigning to decrease the variance of their own policy. This systematically proscribes a candidate from clarifying an opponent's extremist position (e.g., by providing details of his voting record) or clarifying an opponent's reprobate character (e.g., by providing details of his police record). In other words, going negative does not necessarily entail creating uncertainty about an opponent.

Although Ansolabehere and Iyengar (1995a) do not provide an explicit definition, they imply that negative campaigning equates to negative tone or negative word choice. However, the tone of an advertisement can be difficult to determine; Sigelman and Kugler (2003) show that voters can strongly disagree in their perceptions about the tone of a given campaign. And though "opposes" is a negatively charged word, the statement "I opposed tax hikes," is certainly not negative campaigning, and "opposes immigration reform" could be a component of a positively or negatively toned statement, depending upon the context and the audience receiving the message. This is why it is much more informative to classify campaign strategies by their overall content and themes. The Jim Kolbe advertisement cited above does not need sinister music or a threatening announcer for it to be categorized as predominantly negative. It is negative because it says that Randy is Graf disrespectful and implies that he is a traitor.

Most other studies offer a very broad definition of the term. For example, Lau and Pomper (2002) say that "negative campaigning is talking about the opponent—his or her programs, accomplishments, qualifications, associates, and so on—with the focus, usually, on the defects of these attributes". Skaperdas and Grofman (1995) define negative campaigning as "that which attacks the other candidate personally, the issues for which the other candidate stands, or the party of the other candidate".[7]

These definitions equate negative campaigning with "campaigning against an opponent", a category that covers nearly the entire spectrum of political advertising. But there are many reasons to mention an opponent during political discourse. Mayer (1996) argues that "any serious, substantive discussion about what a candidate intends to do after the election can only be conducted by talking about the flaws and shortcomings of current policies." This means that for candidates challenging incumbents, campaigning about political issues *requires* campaigning against the opponent. These comparisons are often necessary to provide voters with a better standard of evaluation (Ansolabehere and Iyengar, 1995a) and are almost mandatory for challengers facing incumbents (Maisel et al. 2007). But, there is little explanatory power gained by labeling every challenger's issue ads as negative. If an opponent is against the death penalty, stating that fact should be considered issue differentiation, and not negative campaigning. Using broader definitions conflates these vastly different campaign strategies, which also have different effects on the electorate, into the general category of "negative".

All of this has confused the empirical literature. Because of the lack of a precise, consensus definition of negative campaigning, there is no solid foundation for empirical research on the subject. Thus, it is no surprise that the outcomes of empirical studies are inconsistent. For

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[7] They also assume that positive campaigning attracts undecided voters only, while negative campaigning turns the opponent's supporters into undecided voters and creates a boomerang effect by which the attacker loses his own voters to the undecided pool. This focuses on an aspect of political strategy, affecting voter turnout, that is not limited to nor defined by negative campaigning.

example, Ansolabehere and Iyengar (1994, 1995a) concluded that negative campaigning decreases turnout; Wattenberg and Brians (1999) and Freedman and Goldstein (1999) determined that it increases turnout; Finkel and Geer (1998) found no consistent effect between negative campaigning and turnout; Kahn and Kenney (1999) found that "useful negative information" increased turnout, while "unsubstantiated and shrill attacks" decreased turnout. Niven (2006) supports the idea that more informed voters are more likely to vote regardless of information tone. After all, there is no necessary causation between being repulsed by negative campaigning and deciding whether to vote. Subjects who feel contempt for politics just after seeing a vicious attack may deem the attack insignificant or false (and then possibly refuse to vote) or instead believe the information is true and that it creates enough differentiation between the candidates to make participation worthwhile.

In another line of research, Theilmann and Wilhite (1998) found that a candidate tends to go negative if behind or in a dead heat. However, Sigelman and Buell (2003) found that in U.S. presidential races, major-party tickets were far more attack-oriented only if their election prospects looked bleak. Yet, Sigelman and Shiraev (2002) concluded that the relative negativity of the candidates is not a function of who is ahead and who is behind, and that candidates rarely adjust their strategies due to the ebb and flow of the campaign. Plus, Lau and Pomper (2001) showed that position in the polls does not affect a candidate's usage of negative strategies. In a meta-analysis of empirical studies of negative campaigning, Lau et al. (1999) found no reliable statistical basis for concluding that negative ads are liked less than positive ones, or that negative political ads are more effective than positive political ads, or that negative campaigning affects voter turnout.

The difficulty in obtaining consistent empirical results might be alleviated by using a definition of negative campaigning that allows for the demarcation of campaign themes into the four types presented in Table 1. In Chapter 2, I incorporate these campaign types into a

theoretical model that can be used as a foundation to understand the fundamental aspects of campaign strategy decisions. This framework also facilitates a shift in focus from discrete ads, which often combine multiple themes, to the underlying campaign strategy, in which themes are more readily separable. Most importantly, it provides answers to the original questions posed earlier: Who goes negative, when do they go negative, and how does it impact election results?

Overview

With the formal model in Chapter 2, I find that whether candidates choose negative campaigning depends upon three factors: the voters' preconceptions about political candidates, the voters' preferred dimension, and the candidates' character traits. I show that eliminating negative campaigning has an ambiguous effect on voter welfare. While it is sometimes possible to improve election outcomes by not allowing negative campaigning, in some other cases, eliminating the negative option can hurt superior candidates. One cannot use a broad sword to cut away all of the negativity from a campaign without permitting inferior candidates to slip into office through the resulting gaps.

In Chapter 3, I extend the formal model of campaigning to include situations in which candidates lie. Here, I find that allowing this option is strictly inferior for voter welfare. Often this is because whenever lying becomes more probable, all campaigns start to look the same. In some instances, allowing candidates to lie also removes the possibility of a pure strategy equilibrium in the formal model, meaning that candidates must employ mixed strategies and thus run the risk of making *ex post* "errors" in campaign choice.

In order to understand the implications of the formal model, I use multiple empirical testing methods. In Chapter 4, I use a laboratory experiment to test how voter beliefs and voter behavior affect the frequency and content of candidates' negative campaigning. I find that in the laboratory as well as the formal model, there is more negative campaigning when candidates are

of poor quality, when voters' prior information suggests that candidates are of high quality, and when voters care strongly about the specific issue to which the negative campaigning is targeted. Furthermore, the results are better explained by a quantal response equilibrium model in which voters are risk averse and are more naïve than sophisticated in their Bayesian updating ability.

Having discussed which candidates are more likely to utilize negative campaigning, I next consider how negative campaigning translates into votes. In Chapter 5, I use survey results to look at how voters respond to character attacks in general. From this, I also show empirical support for candidate tactics that target specific segments of voters based upon their predilections toward accepting negativity in campaigns.

One way candidates attack their rivals is by trying to make voters afraid of them. Conventional wisdom, and a growing body of behavioral research, suggests that the nonverbal image of a candidate influences voter decision making; election outcomes are known to correlate with judgments about a candidate's visual appearance. In the study reported in Chapter 6, we presented subjects with images of political candidates and asked them to make four trait judgments based solely on viewing the photographs. Subjects were asked which of the two faces exhibited more competence, attractiveness, deceitfulness, and threat, which are arguably four of the most salient attributes that can be conveyed by faces. When we compared our subjects' choices to the actual election outcomes, we found that the candidates chosen as more likely to physically threaten the subjects actually lost 65% of the real elections. Such correlation could arise from common neural mechanisms engaged when viewers make social judgments about faces, and when voters evaluate candidates.

As reported in Chapter 7, fear of political candidates is relevant not only behaviorally but also neurologically. This was shown in two independent fMRI studies in which subjects made various social judgments about images of unfamiliar politicians who had run in real elections. In the first study, we found a strong behavioral correlation between real-world election loss and

judgments of threat. Furthermore, election loss correlated with activity in the insula and ventral anterior cingulate cortex, structures known to be involved in processing negative emotions. In the second study subjects cast hypothetical votes. Here we also found activation in the insula and anterior cingulate that correlated with loss in the hypothetical (lab vote) election, as well as activation in the insula that correlated with real-world election loss. These findings suggest that voters are influenced by negative emotions elicited by a candidate's mere appearance.

Finally, Chapter 8 examines the role of candidate fear in explaining voter choice in presidential elections using ANES data from 1980-2004. We find that there are certain segments of the electorate, such as Protestants and Democrats, that more susceptible to fear appeals. After controlling for the factors commonly thought to affect voter decision-making, we also find further evidence that fear of presidential candidates directly affects vote choice. The results have implications for future research on negative political communication, as they suggest that threatening first impressions can harm a candidate's electoral chances. They also show that candidates who are successful in utilize negative campaigning have not only tailored their campaign to reflect the weaknesses of the opponent but have also insured the salience of their message in the minds of the specific group of targeted voters.

Chapter 2

The Formal Model

In this chapter, I incorporate the matrix of campaign strategy definitions from Table 1 into a formal model of campaign strategy. The model is a game for political campaigns in which candidates maximize their standing with the electorate via the optimal dissemination of information.

With this model, I find that the type of campaign chosen by political candidates depends upon three factors: the traits of the candidates, the dimension of greatest importance to the voters, and the degree to which the candidates' character and ideology differ from initial expectations. As a result, negative campaigning will be more likely when the voters have positive initial opinions of the attacked candidate's personal qualities (and of political candidates in general), candidates are of poor character quality, and voters care strongly about the character traits of office seekers. This helps us understand why candidates choose negativity in varying degrees, and why we cannot rely on simple benchmarks, such as the closeness of the race, to determine optimal candidate strategies.

I also show that while in some cases eliminating negative campaigning provides voters with more useful information, in other cases it makes the candidates impossible to distinguish. This ambiguity regarding voter welfare is markedly different from that of Polburn and Yi (2006), whose model also allows candidates to campaign on either character or issues. But in their model, candidates can only campaign by revealing either their own ideology or their opponent's character; as a result, they conclude that eliminating negative campaigning would have an adverse effect on voter welfare. My model differs in that I give candidates a more complete set of

campaign choices. When candidates are also allowed to campaign about their own character (positive campaigning) and their opponents' ideological position (issue differentiation), eliminating negative campaigning has an ambiguous effect on voter welfare.

The General Model

This campaigning game takes place between two candidates, A and B. The two candidates inherit positions on each of two dimensions, Issues and Character, that are assumed throughout to be separable. The issue dimension, I, is the traditional left-right dimension and is given by the set $\{-1,0,1\}$. The character dimension, C, is a valence dimension given by the set $\{-x,x\}$.

There is one voter, V. Preferences of the voter are single-peaked on the issue dimension, and the voter's ideal policy point is 0. By definition, the voter always prefers higher values on the valence dimension. Thus, the voter's ideal point in (I, C) space is (0, x). She represents the preferences of the median voter on the issue dimension, and of every voter on the valence dimension.[8]

Candidates campaign by revealing the true location of one candidate on one dimension. The goal of the voter is to maximize her expected utility. Using the candidates' campaign messages and her prior information, she will attempt to determine both the issue position and the character type of the two candidates, A and B. The voter's utility function for candidate ℓ is:

$$U_V(\ell) = -|(I_\ell)| + (C_\ell). \quad (1)$$

[8] Because one of these dimensions is defined as valence, this setup allows for simplification to one voter with fewer theoretical problems than a model with two issue dimensions. With perfect information, the Median Voter Theorem (Black 1958) holds in a space with voters having single-peaked preferences on the issue dimension, and non-decreasing preferences on one valence dimension (see Groseclose 2007).

So, the voter will choose the candidate ℓ that maximizes the expected value of $U_V(\ell)$. In the case of a tie, she will flip a coin to choose between the candidates. The winning candidate implements his preferred policy and receives a utility β from winning the election or zero from losing the election. So the utility function for candidate ℓ is $U_\ell = \beta\omega_\ell$, where ω_ℓ is the probability of candidate ℓ winning the election.

Candidate Locations

Initially, the candidates' locations $\theta_\ell = (I_\ell, C_\ell)$ are assigned by nature and both are known to the candidates, but not known to the voter.[9] However, the voter is aware that the type θ_ℓ of each candidate has been drawn independently from $\Phi = [\{-1, 0, 1\} \times \{x, -x\}]$ with the distribution described as follows.[10] The value *p* is the probability that a candidate has good personal qualities (*x*), while $1-p$ is the probability he has undesirable character traits $(-x)$. Furthermore, each candidate has probability $1-2q$ of being a centrist, and probability *q* of favoring each extreme.[11]

I assume that *p* and *q* are independent, so at this stage the voter's expected utility is $-2q + x(2p-1)$. Since the voter has Euclidean preferences on the issue dimension, the issue positions of 1 and -1 are mathematically identical when calculating the voter's expected utility.

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[9] The important point is that a candidate will know his opponent's position better than the voter does.
[10] Although simple, this distribution provides enough richness to capture all of the relevant cases (i.e., one candidate is better on both dimensions; each candidate is better on one dimension; candidates are equal on one or more dimensions).
[11] An alternative formulation, in which the variance is different for each candidate (e.g., one candidate is the incumbent), is presented in the Discussion section.

The x term defines the range of the character dimension and captures the importance to the voter of the issue dimension relative to the character dimension.[12] As the value of x increases, this can be interpreted as the voter caring more about the character dimension relative to the issue dimension. Note that the issue dimension range is normalized at [-1, 1] to better capture these effects. So, if the voter cares mainly about personal qualities, x will be of high magnitude and dwarf the utility effects of political issues. Conversely, if the voter cares mainly about policy issues, this will be represented by near-zero values of x.

This one-period game consists of two phases. First is the campaign phase, which is followed by the voting phase.

Campaign Phase

In this game, each candidate has a limited budget, so he can choose exactly one campaign type. Although this modeling choice is simplified, campaigns do generally have an overarching theme, and candidates cannot effectively transmit information on every topic.[13] In the model, a candidate's campaign is the announcement of one of the four unknown locations.[14] That is, a candidate can choose from among the campaign strategies originally shown in Chapter 1:

Issue Differentiation: Revealing the opponent's location on the issue dimension.

Issue Bolstering: Revealing one's own location on the issue dimension.

Negative Campaigning: Revealing the opponent's location on the character dimension.

Positive Campaigning: Revealing one's own location on the character dimension.

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[12] It is convenient to use x as a weight. It technically consists of two components: the weight (w) the voter gives character relative to issues, and the range (v) of the character dimension. Thus, the voter utility function could be alternatively written as: $U_V(\ell) = -|(I_\ell)| + w(C_\ell)$, where $E(C_\ell) = \nu(2p-1)$ and $\nu = 1$.

[13] Jamieson et al. (2000) showed that when voters learned from the 2000 presidential primary campaigns, the learning occurred on the topics featured by the candidates.

[14] This can be thought of as the theme that the candidate most emphasizes during his campaign.

Formally, this means that each candidate ℓ must simultaneously choose a strategy $s_\ell : [\{x, -x\} \times \{-1, 0, 1\}]^2 \rightarrow \Sigma$, where

$$\Sigma = \{(C_\ell = x), (C_{-\ell} = -x), (I_\ell = 0), (I_{-\ell} = \pm 1), \varnothing\}. \quad (2)$$

On line (2) above, each action $a \in \Sigma$ is designated by the notation $D_\ell = \iota$, where D is the dimension of revelation, ℓ is the candidate whose information is provided, and ι is the location. For example, $(C_A = x)$ means that candidate A is revealed to be located at x on the character dimension. Candidates cannot choose "defeatist" strategies (i.e., revealing bad information about oneself or good information about the opponent), which are excluded from Σ. While Σ contains five different types of messages, the realization of θ_A and θ_B may limit the possible choices in Σ because candidates are required to tell the truth. However, candidates will always have at least one option, which is the choice not to campaign $(a_\ell = \varnothing)$.

Notice that each of the possible campaign choices leads to a change in the voter's expected utility for one of the two candidates. Each candidate ℓ improves his standing in the election whenever his campaign announcement $a_\ell \in \Sigma$ increases the voter's expected utility for ℓ or decreases the voter's expected utility for the opponent -ℓ. Let $d_\ell(a_\ell, a_{-\ell})$ indicate the benefit to candidate ℓ from employing campaign announcement a_ℓ with voter posterior beliefs μ and the opponent using strategy a-$_\ell$. In other words, the function $d_\ell(a_\ell, a_{-\ell})$ captures changes in the voter's utility difference between the candidates, and can be written as:

$$d_\ell(a) = |E_\mu(U_V(\ell) \mid a) - E_\mu(U_V(-\ell) \mid a)|. \quad (3)$$

Voting Phase

In this phase, the voter chooses the candidate who gives her the highest expected utility. In making this decision, the voter must rely on both her prior knowledge of the location distribution and the information given her by the candidates via the two campaign themes.[15] Although there is undoubtedly a wide range of analytic ability which can be ascribed to voters, I will consider two separate archetypes for the voter, described as follows:[16]

Naïve voter: The voter accepts the candidates' two announcements $a \in \Sigma$, but does not consider the correlation between the candidates' revelations and their underlying types.

Sophisticated voter: The voter assumes that the revelation of a candidate may also give information about the traits (of both candidates) that the candidate did not reveal. She uses the information revealed by the candidates and the candidates' entire announcement strategies $s(\theta)$ to refine her understanding of the candidates' spatial positions.

The voter, regardless of analytic ability, is not perfect. In any election, she has the probability $\varepsilon(d_\ell(a)) \to [0, \frac{1}{2}]$ of "miscalculating" and voting for the wrong candidate. I assume that $\varepsilon(0) \leq \frac{1}{2}$, that for all z, $\varepsilon(z) > 0$, that the function is monotonic, and that the first derivative $\varepsilon' < 0$.[17] So, as the difference between the candidates increases, the voter is less likely to err.

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[15] In this model, the voter cannot seek out information on her own.

[16] While the standard for formal modeling is to assume Bayesian updating, there is empirical evidence both that voters engage (Alvarez 1998), and that voters do not engage (Redlawsk 2002), in such updating. Eyster and Rabin (2005), citing "evidence that people do not fully take into account how other people's actions depend on these other people's information," model a cursed equilibrium in which players' analytical abilities lie on a continuum between Bayesian updating and ignoring updating altogether (fully cursed). In this model, I consider the voter to be on either end of the continuum, either sophisticated (Bayesian) or naïve (fully cursed) but not a mixture of the two.

[17] A quantal response function fits these criteria; this would lead to a Quantal Response Equilibrium, as detailed in McKelvey and Palfrey (1995). QRE is a formal equilibrium model of imperfect play. Each player uses a quantal response function, which is a continuous best-response function that gives positive probability to choosing all possible actions; the function is monotonically increasing in expected payoffs. As a result, players in QRE do not always play their best responses, but do choose higher payoff responses more frequently than they choose lower payoff responses.

Because the probability of winning also increases with the utility difference between candidates, this helps avoid situations where losing candidates can pick any campaign strategy in equilibrium.

When discussing election outcomes, candidate ℓ is said to "win" the election if the voter intends to vote for candidate ℓ. In this case, ℓ's opponent, $-\ell$, is said to "lose" the election. If the voter has the same expected utility for each candidate, the race will be called a tie, regardless of the coin flip outcome or the subsequent vote.

Results

In this section, I use the general model to answer the questions on negative campaigning that I posed above. First, I define equilibrium for this game and prove existence. Then, I explain how the candidates will choose strategies, and later, I discuss election outcomes with a particular emphasis on the importance of negative campaigning. I begin by assuming that the voter is of the sophisticated type.

Elections with a Sophisticated Voter

DEFINITION 1**:** *Sophisticated Voter Equilibrium*

The equilibrium concept for this game is perfect Bayesian in pure strategies. Thus, for each candidate ℓ and for the voter V, the equilibrium consists of:

(1) Candidate strategies $\tilde{s}_\ell(\theta_\ell, \theta_{-\ell}) \in \arg\max_\ell \omega_\ell(s_\ell, \tilde{s}_{-\ell}(\theta), \tilde{\tau}, \theta)$ where

$$\omega_\ell(s_\ell, \tilde{s}_{-\ell}(\theta), \tilde{\tau}, \theta) = \tilde{\tau}(s_\ell, \tilde{s}_{-\ell}(\theta)) + (1 - 2\tilde{\tau}(s_\ell, \tilde{s}_{-\ell}(\theta)))\varepsilon(d_\ell(s_\ell(\theta), \tilde{s}_{-\ell}(\theta)))$$

(2) Voter strategies $\tilde{\tau}(a) \in \arg\max E_\mu U_V(\tilde{s}, \tau)$

(3) Voter posterior beliefs $\mu(\theta \mid a)$ which are a probability distribution derived from Bayes' law using $\tilde{s}(\theta)$ whenever possible. □

It follows from (1) that if the voter chooses candidate ℓ, his probability of winning, $\omega_\ell(s_\ell, \tilde{s}_{-\ell}(\theta), \tilde{\tau}, \theta)$, is $1-\varepsilon(d_\ell(s_\ell(\theta), \tilde{s}_{-\ell}(\theta)))$. But if the voter chooses candidate -ℓ, then ℓ's probability of winning is only $\varepsilon(d_\ell(s_\ell(\theta), \tilde{s}_{-\ell}(\theta)))$, which is the chance of voter error. Furthermore, this definition simply requires that the voter maximizes her expected utility, and that each candidate ℓ is using a best response to the opponent's equilibrium strategy $\tilde{s}_{-\ell}$. In other words, given the strategy of his opponent, a candidate should not have any incentive to change strategies.

Shortly, I will describe a sophisticated voter equilibrium that exists for all values of the parameters, *p*, *q*, and *x*. First, I will focus on possible equilibria with candidate strategies $\tilde{s}_\ell(\theta_\ell, \theta_{-\ell})$ in which candidate ℓ chooses a specific campaign theme a_ℓ whenever it is true. In this case, the sophisticated voter can rightly assume that the preferred theme a_ℓ is false if candidate ℓ does not use it, though the voter may not necessarily be able to make any additional inferences if a_ℓ is chosen. If both candidates are using a_ℓ whenever possible, and both candidates campaign with a_ℓ, the sophisticated voter's utility updates will look like those of the naïve voter.

So, define *a** as a campaign message that maximizes $d_\ell(a_\ell) = E_\mu(U_V(\ell) \mid (a_\ell, \varnothing)) - E_\mu(U_V(-\ell) \mid (a_\ell, \varnothing))$ where voter beliefs μ are naïve. It seems logical that candidates would prefer as often as possible to reveal *a**, because that information, being the greatest departure from the voter's prior beliefs, is in that sense most useful to her. However, there are sometimes equilibria in the sophisticated voter game where candidates choose a campaign theme a_ℓ whenever it is available, even though $a_\ell \neq a^*$. Following is an example of this:

EXAMPLE 1**:** *Candidates Ignore the Voter's Campaign Preferences*

Assume that $p = \frac{3}{5}$, $q = \frac{2}{5}$, and $x = \frac{4}{5}$. Here, *a** is negative campaigning, meaning that negative campaigning is the biggest departure from the voter's prior beliefs, so in that sense it is the voter's preferred campaign. However, suppose that candidate strategies (and voter beliefs) dictate that issue bolstering will be chosen whenever possible. In this case, a moderate candidate will always reveal his own issue position—even if his opponent is of bad character. So, in one equilibrium, each candidate's strategy is to choose a campaign theme with the following order of preference: issue bolstering (IB), negative campaigning (NC), positive campaigning (PC), issue differentiation (ID).[18] The voter knows that the candidates' types will affect which campaign themes they choose, and will update accordingly. For example, if a candidate uses positive campaigning, this means that both IB and NC were not available, and thus that candidate is an extremist and his opponent is of good character.

Candidates using issue bolstering will have no incentive to deviate to negative campaigning. To see this, suppose that both candidates are $(0,-x)$ and that $a = (IB, IB)$. Voter posterior beliefs are that $\ell = -\ell = (0, x(2p-1))$. If candidate ℓ switches so that $a = (NC, IB)$, voter beliefs are now that $\ell = (\pm 1, x(2p-1))$ and that $-\ell = (0,-x)$. Voter utilities are $U_V(\ell) = -0.84$ and $U_V(-\ell) = -0.8$, so the election favors -ℓ. In general, issue bolstering raises voter utility by 2q, while negative campaigning lowers voter utility for the opponent by $2px - (1-2q)$ because the sophisticated voter assumes from the lack of issue bolstering that ℓ is an extremist. So, this equilibrium requires that $2px < 1$. However, if $p = 0.7$, now ℓ has incentive

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[18] Recall that candidates cannot choose campaigns that reveal harmful information about themselves or good information about their opponent. Assume that if a candidate does not campaign, the voter believes that the candidate is $(\pm 1, -x)$ and that his opponent is $(0,\ x)$.

to switch to $a=(NC,IB)$ from $a=(IB,IB)$, because $U_V(\ell)=-0.68$ and $U_V(-\ell)=-0.8$, and the election favors ℓ. □

A more optimistic equilibrium, in which the candidates show more responsiveness to the voter by always trying to campaign using *a**, exists for all values of *p*, *q*, and *x*. This is shown in Proposition 1 below. Define *a*** as the campaign on the opposite dimension from *a** that maximizes $d_\ell(a_\ell)=E_\mu(U_V(\ell)\,|\,(a_\ell,\varnothing))-E_\mu(U_V(-\ell)\,|\,(a_\ell,\varnothing))$ whenever voter beliefs μ are naive. This is what candidates will use as a secondary theme if the optimal theme *a** is not available.

PROPOSITION 1: *The following is always an equilibrium. Candidates choose the optimal theme a* if it is available (i.e., does not reveal information harmful to the campaigner). If unable to use theme a*, candidates choose the best theme from the opposite dimension, termed a**. If unable to choose either of these two themes, candidates in order try* $-a^{**}$ *(the other theme on the same dimension as a**) and then the redundant* $-a^{*}$ *(the other theme on the same dimension as a*). If none of these are available, candidates do not campaign. If any candidate uses a harmful campaign or does not campaign (i.e., reveals bad information about himself, or good information about the opponent), then he is assumed to have two negative traits* $(\pm 1,-x)$ *and his opponent two positive traits* $(0,\,x)$.[19]

The proof is in the appendix. ■

I focus on the Proposition 1 equilibrium because it provides the voter with more information than any other pure strategy equilibrium in the sense of Blackwell (1953); a more

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[19] The voter's strategy is $\tilde{\tau}=(1,0)$, for ℓ and -ℓ, respectively, whenever $E_\mu U_V(\ell)>E_\mu U_V(-\ell)$. In the case where $E_\mu U_V(\ell)=E_\mu U_V(-\ell)$, $\tilde{\tau}=(\frac{1}{2},\frac{1}{2})$.

informative structure is that which provides a higher expected utility to the decision-maker. This is explained further in the appendix.

The above proposition is also important because it provides behavioral predictions which will be tested in Chapter 4. The reason the secondary option a^{**} must be on the opposite dimension from the primary option a^{*} is that once both candidates fail to choose a^{*}, the sophisticated voter gains perfect information on the dimension of a^{*}, so any revelation on that dimension is redundant. And if exactly one candidate chooses a^{*} (e.g., suppose it is negative campaigning), then his opponent can't profitably choose $-a^{*}$, the opposite campaign on that dimension (in this example, positive campaigning). Note that whenever neither candidate uses a^{*}, the voter will always get perfect information about the candidate types from the campaign revelations.

In the sophisticated voter model, there is another equilibrium that always exists. It is very similar to that of Proposition 1. The difference is that the candidates' preferred first announcement is now $-a^{*}$, defined as the other announcement on the dimension of a^{*}. This works because the opponent's failure to choose $-a^{*}$ automatically implies that a^{*} is not true, and thus provides the same information to the voter as in the Proposition 1 version (though less often).[20] Proposition 14, which also allows either theme on the opposite dimension from a^{*} as a secondary choice, details this equilibrium and appears in the appendix along with its proof.

In any equilibrium apart from that of Proposition 1 or Proposition 14, candidates and voters would sometimes have to coordinate upon a campaign on the dimension opposite from the optimal primary theme a^{*} even when it is a viable campaign option. Then, for some values of p, q, and x, the candidates will have incentives to defect, such as in the latter analysis of Example 1. If $a' \in \{a^{**}, -a^{**}\}$ is the first choice campaign type instead of a^{*} (or $-a^{*}$), then this

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[20] Along the same lines, there are two other equilibria which always exist, specifically those replacing a^{**} with $-a^{**}$ as the default strategy on the opposite dimension from a^{*}.

equilibrium holds only when candidates do not have the incentive to reveal *a** instead of *a'*, that is, when under naïve voting $d_\ell(a^*,\varnothing) < d_\ell(a',\varnothing) + d_\ell(-a',\varnothing)$.

Elections with a Naïve Voter

Next, I consider elections with a naïve voter who does not use Bayesian updating to analyze the candidates' campaign revelations. This requires a change in the equilibrium definition to account for the alteration of voters' beliefs.

DEFINITION 2**:** *Naïve Voter Equilibrium*

The equilibrium concept for this game is fully cursed perfect Bayesian in pure strategies (Eyster and Rabin 2005). Thus, for each candidate ℓ and for the voter V, the equilibrium consists of:

(1) Candidate strategies $\tilde{s}_\ell(\theta_\ell,\theta_{-\ell}) \in \arg\max_\ell \omega_\ell(s_\ell,\tilde{s}_{-\ell}(\theta),\tilde{\tau},\theta)$ where

$$\omega_\ell(s_\ell,\tilde{s}_{-\ell}(\theta),\tilde{\tau},\theta) = \tilde{\tau}(s_\ell,\tilde{s}_{-\ell}(\theta)) + (1-2\tilde{\tau}(s_\ell,\tilde{s}_{-\ell}(\theta)))\varepsilon(d_\ell(s_\ell(\theta),\tilde{s}_{-\ell}(\theta)))$$

(2) Voter strategies $\tilde{\tau}(a) \in \arg\max E_\mu U_V(\tilde{s},\tau)$

(3) Voter posterior beliefs $\mu(\theta \mid a)$ are identical to the voter's prior beliefs about the probability distribution unless the candidate location is directly revealed by *a*. □

The difference between this and Definition 1 is the rule governing voter posterior beliefs $\mu(\theta \mid a)$, which has been modified so that the sophisticated voter does not make use of Bayesian updating. As with the Sophisticated Voter Equilibrium, the voter must be maximizing her expected utility, and each candidate ℓ must be using a best response to the opponent's equilibrium strategy $\tilde{s}_{-\ell}$.

PROPOSITION 2**:** *The naïve voter equilibrium always exists.*

Explanation and Proof. In equilibrium, the voter strategy is simply to vote for the candidate that yields the highest expected utility given her beliefs. Thus if $E_\mu U_V(\ell) > E_\mu U_V(-\ell)$, then $\tilde{\tau}(s_\ell, \tilde{s}_{-\ell}(\theta)) = (1,0)$ for ℓ and -ℓ, respectively. In the case where $E_\mu U_V(\ell) = E_\mu U_V(-\ell)$, then $\tilde{\tau} = (\frac{1}{2}, \frac{1}{2})$, and it follows that $\omega_\ell = \frac{1}{2}$ for each candidate. Candidates do not have to take into account the opponent's strategy $a_{-\ell}$, because the voter cannot make any inferences from the campaign styles that either candidate did not choose. So, the candidates' strategy is to maximize $d_\ell(a_\ell, \varnothing)$, where a_ℓ is any of the five possible disclosures. The voter's original expected utility for each candidate, $U_V(\ell)$, is $-2q + x(2p-1)$. Calculating $d_\ell(a_\ell, \varnothing)$ in the naïve voter case just requires computing the change in the voter's expected utility once the voter learns that a_ℓ is true. Issue differentiation changes $U_V(-\ell)$ by $1-2q$, while issue bolstering changes $U_V(\ell)$ by $2q$. Negative campaigning changes $U_V(-\ell)$ by $2xp$, while positive campaigning changes $U_V(\ell)$ by $2x(1-p)$. Because $\varepsilon(d_\ell(s_\ell(\theta), \tilde{s}_{-\ell}(\theta)))$ is monotonic, a candidate who chooses a_ℓ to maximize $\varepsilon(d_\ell(s_\ell(\theta), \tilde{s}_{-\ell}(\theta)))$ also maximizes his probability of winning the election. Therefore, choosing any option other than the action a_ℓ that maximizes $d_\ell(a_\ell, \varnothing)$ is a dominated strategy because it lowers a candidate's probability of winning. ■

So, with a naïve voter, candidate strategy is straightforward. Candidates will try to find a dimension to which the voter will be most responsive. Three factors determine the campaign themes chosen. First is the dimension that is most important to the voter. For example, character campaigning is more likely as x increases. To see this, define P as the larger of p and $1-p$, and then Q as the larger of $2q$ and $1-2q$. So, P designates which character strategy has the highest

potential upside, while Q does the same for issue strategies. Character campaigning is preferred whenever $x > \frac{Q}{2P}$; issue campaigning when $x < \frac{Q}{2P}$. The second factor, $\frac{Q}{2P}$, captures the relationship between the voter's preconceptions about (i.e., priors for) each dimension. The voter's prior beliefs about candidates' issue stances and character traits determine which campaign strategy will provide information that most diverges from those preconceptions. For example, when p increases, she believes that candidates are better people (i.e., have higher expected valence), and so negative campaigning becomes a more effective strategy because it provides a greater deviation from the voter's prior expectations. Whenever $p > \frac{1}{2}$, negative campaigning will be more effective than positive, and whenever $2q > \frac{1}{2}$, issue bolstering will be more effective than issue differentiation. The third key factor is the realization of candidate types. Following is an example of strategy choice at work.

EXAMPLE 2**:** *Candidates with Different Strengths*

Assume that candidate A is $(\pm 1,\ x)$, candidate B is $(0, -x)$, $p = \frac{3}{4}$, $q = \frac{1}{3}$, and $x = 1$. In other words, candidate A is an extremist with good valence characteristics, and candidate B is a moderate with bad valence characteristics. Before the election, from the voter's perspective each candidate is of good character (x) with probability $\frac{3}{4}$, bad character $(-x)$ with probability $\frac{1}{4}$, an extremist (± 1) with probability $\frac{2}{3}$, and a moderate with probability $\frac{1}{3}$. Since $\frac{Q}{2P} = \frac{4}{9} < x$ and $p > \frac{1}{2}$, negative campaigning is optimal.[21] Notice that this is just another way of saying that negative campaigning, if available as a revelation (i.e., the opponent is a bad character type),

[21] Note that in Example 2 the values of *p, q,* and *x* determine both the campaign themes chosen and the expected election outcome. Whenever $2q > 2Px$, then issue bolstering will win for A. If $1 - 2q > 2Px$, then issue differentiation will win for A. If $Q < 2px$, then negative campaigning will win for B, and if $Q < 2x(1 - p)$, then positive campaigning will win for B.

maximizes $d_\ell(a_\ell)$. However, candidate B, due to his opponent's valence advantage, is forced to campaign on the issue dimension. While A employs negative campaigning, B resorts to his best option, issue bolstering. □

Example 2 shows how campaigns can diverge whenever there are highly dissimilar opponents. Just because two candidates employ wildly different tactics does not mean that one of those candidates is making a strategic blunder. In fact, based upon this paradigm, we should generally expect political campaigns to differ in content. This is due not only to the wide variety of candidates that run for political office, but also to the changing relevance to voters of political and candidate-specific information.

I will now move forward to discuss election outcomes. First, for sake of plausibility, it would be preferable if a candidate superior to the opponent on both dimensions was heavily favored to win the election. Definition 3 describes a superior candidate, and Proposition 3 shows that such a candidate will be victorious.

DEFINITION 3: *Let ℓ be a strictly better candidate than -ℓ if he is strictly preferable to the voter in both character* $(C_\ell > C_{-\ell})$ *and ideological placement* $(|I_\ell| < |I_{-\ell}|)$.

PROPOSITION 3: *A strictly better candidate will always win the election.*

Proof. Without loss of generality, assume that candidate A is $(\pm 1, -x)$ and candidate B is $(0, x)$. Before the campaign phase, a vote for either candidate gives equal expected utility to the voter. However, every campaign revelation will either improve voter utility from electing B or reduce voter utility from electing A. As a result, the strictly better candidate, B, will win the election (barring voter error). ■

While strictly better candidates will win elections, this result does not carry over to weakly better candidates, as defined and shown below.

DEFINITION 4: *Let ℓ be a weakly better candidate than -ℓ if he is weakly preferable to the voter in both character* $(C_\ell \geq C_{-\ell})$ *and ideological placement* $(|I_\ell| \leq |I_{-\ell}|)$*, with at least one of these being a strict inequality.*

PROPOSITION 4: *A weakly better candidate will not always win the election.*

Proof. Example 3 below demonstrates this. ■

EXAMPLE 3**:** *A Weakly Better Candidate*

Assume that candidate A is $(0,-x)$, candidate B is $(\pm 1,-x)$, $p=\frac{3}{4}$, $q=\frac{1}{3}$, and $x = 1$. In other words, candidate A is a moderate with bad valence characteristics, and candidate B is an extremist with bad valence characteristics. Because, just as in Example 2, a negative campaign maximizes $d_\ell(a_\ell)$, in equilibrium both candidates will be slinging mud, and the race will end in a dead heat. ■

It is with weakly better candidates that the dimension of competition becomes critical. In Example 3, the voter defines character as the dimension of competition. Because the voter prefers to know about valence characteristics, she never gets the opportunity to learn about political issues. In fact, efforts by a candidate to concentrate on policy issues will backfire, because he will have remained silent about character, which is the dimension most important to the voter. Because it isn't possible to give the voter perfect information by making every dimension salient in the political debate, a weakly better candidate may lose.

Notice that a simple remedy to improve the election outcome in Example 3 would be to eliminate negative campaigning. This would shift the campaign to the issue dimension, on which A is a clear winner.

In general, negative campaigning will hurt election outcomes (by giving an inferior candidate a much better chance to win) whenever the following two conditions are met. First, the voter must care mainly about character issues and second, candidates must have similarly poor character traits but significantly different issue positions.

However, as Example 4 shows below, in some elections negative campaigning is the only way to weed out an inferior candidate.

EXAMPLE 4**:** *Another Weakly Better Candidate*

Assume that candidate A is $(0,x)$, candidate B is $(0,-x)$, and that $p=\frac{3}{4}$, $q=\frac{1}{3}$, and $x=1$. In other words, both candidates are moderates and A is of superior character. As in the previous examples, negative campaigning is the ideal campaign theme. Without interference, A will choose negative campaigning, and B will choose issue bolstering. However, once the option of negative campaigning is removed, A will also choose issue bolstering. But now, the race will be a tie. Even worse, if A is $(\pm 1,x)$ and B is $(0,-x)$, then A will only have positive campaigning as an option. The voter, who prefers issue campaigning over positive campaigning (due to the relatively high probability that candidates are of good character), will choose B, who provides *lower* voter utility than A. In this example, negative campaigning improves voter welfare because it allows the character of the messengers to outweigh any political issues that the candidates address. □

Negative campaigning is more likely to affect election outcomes when the voter cares strongly about character ($x>\frac{Q}{2P}$) and has a generally positive opinion of candidates ($p>\frac{1}{2}$).

Interestingly, in a world of truthful revelations, only a candidate of bad character will strive to eliminate negative campaigning. As in Example 3, he may be trying to highlight his issue advantage. Or, as in Example 4, he might be hoping to hide his character disadvantage and move the fight to a more neutral ground. The intricacies of the situation will dictate whether a shift away from negative campaigning will help or hinder the political environment.

In the Proposition 1 equilibrium, the existence of a sophisticated voter rarely changes the election outcome of the analogous naïve voter case. One exception is that she chooses a weakly better candidate in fewer cases than the naïve voter does. This happens only when the voter cares so strongly about one dimension that she prefers both types of information on that dimension. Following is an example.

EXAMPLE 5: *Campaign Strategy Dependent on Voter Sophistication*

Assume that candidate A is $(0,-x)$, candidate B is $(\pm 1,-x)$, $p=\frac{1}{4}$, $q=\frac{1}{3}$, and $x=2$. In other words, candidate A is a moderate with bad valence characteristics, candidate B is an extremist with bad valence characteristics, and because $x = 2$, the voter cares more about character relative to issues. Since negative campaigning maximizes $d_\ell(a)$, if the voter were naïve then A would reveal $(\mathrm{C_B}=-x)$, B would reveal $(\mathrm{C_A}=-x)$, and the election would end in a tie. But suppose instead that the voter is sophisticated. Now, candidate A can profitably switch to issue bolstering $(\mathrm{I_A}=0)$, because his message of $(\mathrm{C_B}=-x)$ is redundant to the sophisticated voter; the voter can infer $(\mathrm{C_B}=-x)$ from B's failure to reveal $(\mathrm{C_B}=x)$. Furthermore, B, who is an extremist facing a moderate, cannot profitably change to another campaign tactic. Thus candidate A, the weakly better candidate, will now win the election. Note that if candidate A

reveals $(I_A = 0)$, he must be sure that the voter is sophisticated. With a naïve voter, if A chooses issue bolstering, it ensures his defeat. □

Again, this situation only occurs if two themes on the same dimension both result in $d_\ell(a)$ larger than that from the two themes on the other dimension. Otherwise, it is possible for a sophisticated equilibrium to exist where a weakly better candidate may still lose the election, and one can easily construct cases where Example 3 and Example 4 still apply. If a^* had been negative campaigning, the effect of its elimination depends upon which new equilibrium the candidates coordinate, as there will usually be multiple equilibria to choose from, some of which have a^* as positive campaigning. However, if the new equilibrium places a^* on the issue dimension, then even with a sophisticated voter, eliminating negative campaigning can still have an ambiguous effect on voter welfare.

Discussion

This section introduces various interpretations and extensions to the theory presented. The first of these approaches is the introduction of uncertainty regarding the median voter's ideal point.

Median Uncertainty

Heretofore, the general model has mainly used the distinction between valence campaigning and issue campaigning by discussing its impact on median voter results. However, the importance of character relative to issues can be further addressed by the following model extension, in which candidates are uncertain of the median voter's location.[22]

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[22] For an explanation about how uncertainty affects an election with two valence dimensions, see Wittman (2001).

Suppose that the median voter is located at -1 with probability α, located at 1 with probability α, and located at 0 with probability 1-2α. This setup would better incorporate the distinction between issue and character campaigning, because for a valence dimension, there is never uncertainty about the voter's preferences. She always prefers higher values. Especially in the naïve voter case, we should expect a larger incidence of negative campaigning as α increases, because candidates will be certain of how and to what extent it would work. In contrast, candidates could actually lower their chances of winning by making the wrong revelation on the issue dimension.

Modeling Variance Discrepancies

The general model can be modified to capture the effects of incumbency (or other situations when candidates have different variances) by limiting the incumbent to a smaller range of values on each dimension. An incumbent's variance would likely be smaller than that of a previously unknown challenger because of the voter's presumed knowledge of the incumbent's performance in office as well as information revealed about the incumbent during his previous successful campaign(s). Strategy differences may arise if voters are risk-averse and thus prefer a lower variance candidate to a higher variance candidate with the same expected value.

This scenario can be modeled as follows. The type of Candidate A (Incumbent), $\theta_{\mathrm{A}} = \left(\mathrm{I}_{\mathrm{A}}, \mathrm{C}_{\mathrm{A}}\right)$, is drawn independently from $\Phi = [\{-y_A, 0, y_A\} \times \{x_A, -x_A\}]$ with the probability p_{A} that candidate A has good personal qualities (x_{A}), and the probability $1 - p_{\mathrm{A}}$ that he has undesirable character traits ($-x_{\mathrm{A}}$). Furthermore, A has the probability $1 - 2q_{\mathrm{A}}$ of being a centrist, and probability q_{A} of favoring each extreme. The type of Candidate B (Challenger), $\theta_{\mathrm{B}} = \left(\mathrm{I}_{\mathrm{B}}, \mathrm{C}_{\mathrm{B}}\right)$, is drawn independently from $\Phi = [\{-y_B, 0, y_B\} \times \{x_B, -x_B\}]$ with the probability p_{B} that candidate B has good personal qualities (x_{B}), and the probability $1 - p_{\mathrm{B}}$ that he has

undesirable character traits ($-x_B$), where $x_A < x_B$. Furthermore, B has the probability $1 - 2q_B$ of being a centrist, and probability q_B of favoring each extreme, where $0 < y_A < y_B \leq 1$.

Before the campaign stage, the voter's expected utility from electing candidate ℓ is $-2q_\ell y_\ell - f(y_\ell) + x_\ell (2p_\ell - 1) - f(x_\ell)$, where $f()$ is some function of the range between the possible realizations of candidate locations.

Allowing Candidates to Lie

Another useful modification allows candidates an opportunity to misrepresent their true character and issue positions. While the model presented here assumes that candidates will tell the truth, this extension would explain how changes in the likelihood of being caught lying would affect their campaign strategies. One possible formulation introduces an independent monitor (e.g., free press) that uses some exogenous effort level that results in some positive probability that a candidate's lie will be revealed.[23] In addition to the voter inferences available to the sophisticated voter whenever a candidate is caught lying, mendacious candidates would also pay a fixed cost of exposure. This extension is further developed in Chapter 3.

Conclusion

First, I will review the questions posed at the outset. Who engages in negative campaigning? If negative campaigning most affects voter expected utility, any rational candidate does so. Otherwise, it may be a strategy forced upon a candidate whose issue position or character does not meet voter standards. Of course, in this case, the candidate is likely to lose the election anyway.

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[23] Alternatively, the model could include strategic monitors who generally favor one party over another, or who vary their effort level in response to the campaign types that are chosen.

When do candidates choose negative campaigning? Campaign choices depend upon three factors: the character and issue positions of the candidates, the predispositions of the voters, and the dimensions of political importance to the voters. These three variables should be the starting point of any empirical testing of this model. Negative campaigning will be more likely when the voters have positive initial opinions of the candidate's personal qualities and care strongly about the character traits of office seekers.

Candidates at the onset of a campaign will use these three variables to choose a strategic goal and a plan toward achieving that goal. It follows naturally from this model that candidates, once they have determined the optimal campaign themes, should have little incentive to alter their strategies throughout the course of the campaign. However, the candidates could change their communication tactics to ensure that their original strategy is properly conveyed to the electorate.

When does negative campaigning matter? It can help a superior candidate to victory, but can also help an inferior candidate muddle the landscape. Again this depends on the voters. If they are especially interested in information about character, they are likely to see more negative campaigning. Interestingly, voters who generally have positive impressions of political candidates will also see more negative campaigning, which could frustrate the voters because the information would be dissonant with their general perception of politicians. Conversely, voters who generally view politicians as untrustworthy scoundrels will be less inundated with negative advertising, because these people would view the information as less surprising and so would not be much affected by it.

There are several ways to add additional players to this model. For instance, this model could provide an interesting beginning for considering endogenous candidate choice. There may be a marked effect on nomination choices of competing political parties given their knowledge of how the upcoming election will play out. Introducing more candidates into a single plurality rule election will increase the effectiveness of a candidate's positive campaigning (or issue bolstering)

because those campaign types benefit that candidate in comparison to all other candidates. However, negative campaigning benefits a candidate in relation to only one other candidate—while also increasing the utility difference for all of the opponents in relation to the attacked candidate. Another possible route would be to include independent actors (e.g., the 527 group "Swift Boat Veterans for Truth", though these independent parties need not be so partisan) that have the ability to launch advertisements.[24] In order to answer the important questions about negative campaigning, I have provided a campaign strategy framework that clarifies the meaning of negative campaigning, and a campaign strategy game where candidates choose from positive campaigning, negative campaigning, issue bolstering, and issue differentiation. By providing this foundation, this study may serve as the starting point for additional research on how candidates choose campaign strategies and on how those strategies affect voter opinion and election results.

[24] The number "527" refers to a specific section of the United States tax code. In short, 527 groups fall outside the scope of the Federal Election Commission, and are not legally allowed to coordinate with any specific campaign.

Chapter 3

Extension With Lying Candidates

Lying and negative campaigning are so often conflated in politics that the two concepts become difficult to extricate. This is manifest in political discourse, as exemplified by the following advertisement, taken from a 2006 House of Representatives campaign in Kentucky:[25]

> Announcer: John Yarmuth. He plays golf with Saddam Hussein, and snatches toys away from little children. Ridiculous?
>
> Yarmuth: No more so than Anne Northup's dishonest TV ads. The fact is, Northup and Bush have failed our country, and we need to make a change. Anne won't discuss the real issues. In fact, she won't discuss issues at all. All she'll do is attack and smear, and you deserve better. I'm John Yarmuth, and I approved this ad, because we can't change Washington unless we change the people we send there.

Here, Yarmuth criticizes his opponent's predilection for negative campaigning, using a bit of humor to emphasize his belief that her attacks are egregious lies. Of course, the advertisement does not offer any suggestions as to whether the voters should accept negative campaigning if it is true; the implication is that any character attack (which doesn't "discuss the issues") is both frivolous and false.

In fact, some political campaigns claim to have magnanimously refrained from revealing secret scandalous information about the opponent, but threaten to reveal it later.[26] Why withhold this information until the waning days of a close election? Advertisements are only one tactic for

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[25] The advertisement "Ridiculous" was taken from the official campaign website for John Yarmuth: http://www.yarmuthforcongress.com/yarmuth.php/campaign/multimedia/television-spots/ridiculous/. Last accessed June 2007.

[26] Or, at least, someone conjectures that this has occurred. Here is an example from the 2007-8 Democratic Presidential primary: http://www.foxnews.com/story/0,2933,312153,00.html. Versions of this received mainstream press coverage: (e.g., http://blog.washingtonpost.com/the-trail/2007/11/17/clinton_obama_feud_over_novaks.html) and were even brought up during one of the Democratic debates.

conducting a negative campaign; if worried about some sort of backlash, campaigns can inoculate themselves against this by instead passing off such information to the media outlets (hoping for a result as in footnote 26, for example). So, I suggest that the most plausible reasons to completely suppress such "damaging" information are not because it is negative, but instead because either it does not exist, or it is patently false. Indeed, the best time to blatantly lie about an opponent is the probably the end of an election cycle, before there is time for the falsity to be uncovered—although vague lying about an opponent earlier in the campaign may force him to divert campaign funds to defend himself, in which case the liar has defined the dimensions on which the campaign will proceed.

The distinction between lies and negativity has often been ignored in previous empirical studies of negative campaigning. For example, Ansolabehere and Iyengar (1995a), who created their own commercials to judge subjects' attitudes toward negative campaigning, produced two versions of each negatively toned ad in which only the candidate's name differed. As a result, some subjects heard that (liberal) Barbara Boxer was opposed to women's issues. Clearly, this would not be a credible attack, but in their analysis the effects of this attack on voter opinion are treated identically as those from more truthful alternative attacks. What their study does not address is how the credibility of candidates' campaigns affects their viability.

Though certainly desperate and/or unscrupulous politics may resort to lies, and sometimes these lies are negative campaigns, we should not draw the conclusion that falsehoods and negativity are inexorably linked. Instead, we should strive to separate the effects of false campaigns from the effects of attack campaigns.[27] The formal model of campaign strategy in Chapter 2 offers this opportunity.

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[27] In fact, Jamieson, Waldman, and Sherr (2000) showed that presidential ads mentioning an opponent were on average more truthful than self-advocacy ads.

Negative Campaigning, Candidate Valence, and Lies

As first indicated in Chapter 1, my model gives candidates the opportunity to campaign on both valence and policy dimensions, and I define negative campaigning as attacking the opponent's character (i.e., valence). Polburn and Yi (2006) is another model that allows campaigning on these two dimensions, but both in their model and the model in Chapter 2, candidates are required to tell the truth. Bhattacharya (2006) models candidates who can lie by omission but not directly; he models campaigning as a hide and seek game on one dimension. Here, bad candidates try to avoid debate with good candidates, but are unsure whether their opponent is of a good type.

While some other formal models of campaign strategy have allowed candidates to lie about their traits, these have focused solely on misrepresenting policy positions even when candidates' valence is included in the model. In this paradigm, while candidates have the freedom to choose their policy positions during the campaign, their valence qualities are static and usually common knowledge prior to the election. But, this creates an imbalance where candidates are able to misrepresent their true policy preferences but have no opportunity to misrepresent their own valence. These models correct for the imbalance by requiring the candidates to implement the resultant policy; thus, determining the candidates' ideological veracity is no longer a relevant concern for the voters.

The most common objective of this literature is to understand the effect on candidates' policy positioning when one of the two candidates has a fixed valence advantage (e.g., Londregan and Romer 1993). Ansolabehere and Snyder (2000) show that candidates with a fixed valence advantage choose more moderate policy positions. Groseclose (2001) concludes that disadvantaged candidates will choose more extreme positions. Adams and Merrill (2007) find similar results when candidates as well as voters care about the winning candidate's valence. Aragones and Palfrey (2002) show that when candidates of different quality compete, policy

choices will differ from the median and that lower valence candidates will choose more extreme positions; they also demonstrate this experimentally (Aragones and Palfrey 2004). In Harrington and Hess (1996), candidates with lower valence will tend toward defining the opponent's ideology rather than defining his own ideology. In Kartik and McAfee (2006), candidate valence is unknown, and candidates' policy choices can provide the voter with character inferences. But in their model, candidates nevertheless are prohibited from directly campaigning on valence.

I use a different approach in which the candidates can utilize a valence advantage not via more nuanced policy choices but instead by simply campaigning on character. In politics, candidates who are able to obfuscate policy ideal points will also be capable of lying about character traits, and perhaps will be more effective doing the latter. In comparison to character information, political policy stances are often easier to identify, as many candidates for higher offices have a wealth of speeches, writing, and votes on the record for a wide range of ideological topics. This same information makes it harder to credibly misattribute issue stances to an opponent or to adopt issue positions that are inconsistent with one's previous public record. Character assaults, though, are based on information which is arguably more abstract and less verifiable; so, many candidates are more susceptible to calumny than to falsified claims about their issue positions. For example, it is harder to prove that one is not an adulterer or not a poor leader than to prove one is not pro-choice.

It is the goal of this paper to understand how mendacious candidates affect campaigns and election outcomes. To analyze this, I use an extension of the model of Chapter 2 that introduces to the candidates the option of making false campaign revelations. In this model extension I make it possible for candidates to misrepresent their locations on both the valence and issue dimensions. In contrast to Callander and Wilkie (2007) where candidates each have an internal characteristic that determines their propensity to lie, in this model candidates are equally willing to lie and do not always benefit from doing so. I instead introduce an independent

monitor that attempts to uncover false statements. While this monitor (e.g., a free press) can vary in efficacy, it is not a strategic player and its effort is candidate independent.[28] I also include a fixed cost that a candidate must pay if exposed. I do not grant every candidate an equal success rate from negative campaigning; in this model true campaigns are always successful, so low valence candidates are more susceptible to attack.

I find that if there is neither an immediate cost for being caught lying nor a risk of being caught, all campaigns will look the same (i.e., candidates will always choose the same campaign theme). I also find that lying is less likely in close elections. Finally, I find that voter welfare improves as the penalties for being caught lying increase and also as the probability of being caught lying increases. Stifling mendacious candidates always improves voter welfare; in comparison, recall from Chapter 2 that removing negative campaigning leads to ambiguous voter welfare effects.

The Extended Model

The model is a modification of that from Chapter 2, with the changes to the game detailed below. Since candidates are allowed to lie, all five campaign choices in Σ are now available regardless of the realization of candidate types. Recall that each candidate ℓ must simultaneously choose a strategy $s_\ell : [\{x,-x\} \times \{-1,0,1\}]^2 \to \Sigma$, where

$$\Sigma = \{(C_\ell = x),(C_{-\ell} = -x),(I_\ell = 0),(I_{-\ell} = \pm 1),\varnothing\}. \quad (4)$$

[28] There has been a considerable literature suggesting that suboptimal ad watch practices by the media (e.g., overly critical commentary) can actually help the party being criticized (Ansolabehere and Iyengar 1995b, Min 2002, Jamieson and Capella 1997). Here I assume that the third party monitoring is credible and that the evidence for truth or falsity of a campaign is unambiguous, and as such, uncovering a falsehood is never beneficial to the liar.

The four campaign types are named as follows: $(C_\ell = x)$ is positive campaigning (PC), $(C_{-\ell} = x)$ is negative campaigning (NC), $(I_\ell = 0)$ is issue bolstering (IB), and $(I_{-\ell} = \pm 1)$ is issue differentiation (ID).

Another difference is the inclusion of an independent monitor whose sole purpose is to uncover candidates' lies.[29] It exogenously chooses some fixed effort level, which combined with its exogenous efficiency results in some probability $\pi \in [0,1]$ that any lie is disinterred.[30] If a candidate is caught lying, the candidate pays a fixed cost κ, and the voter is informed both of the candidate's attempted campaign strategy and that the lie has been exposed. The penalty κ can be interpreted as either financial (e.g., litigation costs) or political (e.g., character damage that hurts future electability). Candidates caught lying are not allowed a replacement campaign, so they also may pay an opportunity cost.

The function $d_\ell(a)$, which captures changes in the voter's utility difference between the candidates, must be altered to account for candidates' potentially being caught in a lie. In the case of a sophisticated voter, candidates not caught lying may still be lying with some probability. Let φ be a vector indicating whether each candidate has been caught lying (0 for no, 1 for yes), so now:

$$d_\ell(a,\varphi) = | E_\mu(U_V(\ell) \mid a,\varphi) - E_\mu(U_V(-\ell) \mid a,\varphi) | . \qquad (5)$$

After the campaigning and possible revelation of lies, the voter chooses a candidate with some probability of error, $\varepsilon(d_\ell(a,\varphi)) \to [0, \frac{1}{2}]$, such that as the difference between the candidates

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[29] Not only have news organizations actively conducted political ad watches since circa 1990 (Just et al. 1996), but non-profit organizations such as FAIR (Fairness & Accuracy in Reporting) monitor the monitoring (http://www.fair.org/index.php?page=1885). The existence of third-party monitoring is clear, though obviously the direction of the biases is not, and furthermore candidates may also monitor each other. I return to this subject briefly in the conclusion.

[30] See Kunicova and Mattes (2005) for a similar treatment of independent monitoring organizations.

increases, the voter is less likely to err. [31] This becomes important later in identifying situations when candidates will have the incentive to lie.

Results: Elections with a Sophisticated Voter

In this section I define three different types of equilibria and present the conditions required for each of these to exist. This includes discussion about how the incidence of voter error affects the incentives to lie, and how candidate lying and negative campaigning can impact voter welfare. To begin, I update the Sophisticated Voter Equilibrium from Chapter 2.

DEFINITION 5**:** *Sophisticated Voter Equilibrium*

The equilibrium concept for this game is perfect Bayesian in pure strategies. Thus, given the exogenous values (π,κ), for each candidate ℓ and for the voter V the equilibrium consists of:

(1) Candidate strategies $\tilde{s}_\ell(\theta_\ell,\theta_{-\ell}) \in \arg\max_\ell(\omega_\ell(s_\ell,\tilde{s}_{-\ell}(\theta),\tilde{\tau},\theta) - \kappa(\pi \mid (s_\ell,\theta))$ where

$$\omega_\ell(s_\ell,\tilde{s}_{-\ell}(\theta),\tilde{\tau},\theta) = \tilde{\tau}(s_\ell,\tilde{s}_{-\ell}(\theta)) + (1-2\tilde{\tau}(s_\ell,\tilde{s}_{-\ell}(\theta)))\varepsilon(d_\ell(s_\ell(\theta),\tilde{s}_{-\ell}(\theta)),\varphi)$$

(2) Voter strategies $\tilde{\tau}(a,\varphi) \in \arg\max E_\mu U_V(\tilde{s},\tau)$

(3) Voter posterior beliefs $\mu(\theta \mid a,\varphi)$ which are a probability distribution derived from Bayes' law using $\tilde{s}(\theta)$ whenever possible.

The candidates' maximization equation now includes the risk of being caught lying given the strategy and candidate types $\kappa(\pi \mid (s_\ell,\theta))$, which equals zero for candidates telling the truth.

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[31] As in Chapter 2, I assume that I assume that $\varepsilon(0) \le \frac{1}{2}$, that for all z, $\varepsilon(z) > 0$, that the function is monotonic, and that the first derivative $\varepsilon' < 0$.

The nature of the possible equilibria is affected by (π, κ), which represents the odds of and the penalty for being caught in a lie.

To see this, first consider the case $\pi = 0$, in which there is no possibility of being caught. Although in this case candidates are free to choose any campaign theme, these campaigns are cheap talk, which limits the possible equilibria. One possibility is that the voter *a priori* believes that one candidate, ℓ, is the better candidate so votes for ℓ regardless of the campaigns chosen. This is an equilibrium for any choice of candidate strategies.

Another possibility is that the voter believes that one particular campaign theme will be chosen by higher quality candidates, so candidates always choose that theme. When a candidate always chooses the same campaign, he is using what I define as a *one-theme strategy*. This leads to the following proposition.

PROPOSITION 5: *If there is no possibility of being caught lying ($\pi = 0$), and candidates have an equal chance of winning when they both choose the same campaign theme, but unequal chances of winning when they choose different campaign themes, in any equilibrium both candidates use identical one-theme strategies.*.

Proof. Instead, suppose that in equilibrium, the two candidates $(\theta_\ell, \theta_{-\ell})$ have chosen different campaign themes. Then voter utility for one candidate (say ℓ) is higher. Then, candidate -ℓ can always switch to the same theme ℓ is using, regardless of whether it is a lie, because -ℓ's lie will never be revealed. Thus $s_\ell \neq s_{-\ell}$ is not an equilibrium. ■

This proof doesn't guarantee an equilibrium but instead characterizes it if it should exist. It explains that when lying is relatively safe, we should expect all candidates to release the same information, as in the *one-theme equilibrium* defined below, which also allows for $\pi > 0$.

DEFINITION 6: *One-Theme Equilibrium*

All candidates choose the same announcement $a' \neq \varnothing$, regardless of whether it is true. After the campaigns, the voter updates the probability of *a'* being true based upon whether the candidates have been caught lying (φ).[32] If a candidate ℓ chooses a campaign other than *a′*, the voter assumes that candidate -ℓ is $(0, x)$ and his deviating opponent is $(\pm 1, -x)$ unless -ℓ has been caught lying, in which case the voter instead acknowledges that -ℓ's lie reveals one trait that is favorable to ℓ.[33]

In this equilibrium, the off-path voter beliefs about deviating candidates make it very likely that lying is more advantageous than deviating. Here, the candidates always discuss the same thing during campaigns. It is better for them to lie and tell the voters what they expect to hear rather than discuss something else or nothing at all. In the latter two cases, the voter will think the worst of the candidate anyway.

For example, suppose that the single theme (*a′*) is positive campaigning, and that candidate ℓ is of negative character facing an opponent of positive character. If ℓ, instead of choosing positive campaigning, chooses anything else, the voter assumes that ℓ is an extremist with negative valence $(\pm 1, -x)$ and his opponent is a moderate with positive valence $(0, x)$. ℓ's chances of winning are now contingent upon voter error $\varepsilon(2x+1)$. But, if ℓ decides to reveal his own positive character (a lie), ℓ's chances of winning when caught are $\varepsilon(d_\ell((a', a'), (0,1)))$, which

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[32] For example, suppose that *a′* is positive campaigning. If a candidate in this equilibrium is not caught lying, then the chances of him being of good character are $\frac{p}{1-\pi+p\pi}$, and so the voter's expected character utility of that candidate is $x(\frac{p}{1-\pi+p\pi} - \frac{(1-p)(1-\pi)}{1-\pi+p\pi})$, which can be simplified to $x\frac{2p+\pi(1-p)-1}{1-\pi(1-p)}$.

[33] For example, if a' is negative campaigning or issue bolstering, and is revealed as a lie, then the voter must assume the corresponding trait of the opponent (positive character or issue moderation, respectively) is true.

is never less than $\varepsilon(2x+1)$. So, as long as the cost κ of being caught lying is not too prohibitive or the chance of getting caught is sufficiently low, this equilibrium will exist.

Identifying situations in which candidates are playing the one-theme equilibrium is important; in these cases, it would appear to voters that candidates (and politics in general) are completely unresponsive to their needs or to changes in the political landscape. Voters perceiving this usually get frustrated and say things like, "All politicians are the same!" To produce more differentiation between candidates, it is necessary that their campaign statements be verifiable, though this alone does not preclude one-theme strategies. Sufficient conditions for the one-theme equilibrium are delineated in the following proposition.

PROPOSITION 6: *The one-theme equilibrium using the campaign theme a' is an equilibrium provided the following conditions hold:*[34]

$$\tfrac{\beta}{2}(1-\pi)+\pi(\beta\varepsilon(d_{\ell}((a',a'),(0,1)))-\kappa)\geq\beta\varepsilon(2x+1) \tag{6}$$

$$\tfrac{\beta}{2}-\kappa\pi\geq(1-\pi)\beta\varepsilon(2x+1)+\pi\beta\varepsilon(\max\{2x,1\}) \tag{7}$$

A candidate has the most to gain from a deviation when the universal campaign choice *a'* would have been a lie, which leads to conditions (6) (for when the opponent is not lying) and (7) (for when the opponent is lying).[35] If both of these hold, then this one-theme equilibrium exists for theme *a'*. Incidentally, it is always an equilibrium when the candidates' single "theme" is refusing to campaign ($a'=\varnothing$).

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[34] Recall that the arguments for d_{ℓ} include φ, which indicates whether either candidate has been caught lying. $\varphi=(0,1)$ means that only candidate -ℓ has been caught.

[35] The left-hand side of equation (7) is a simplification of:
$(1-\pi)^2\frac{\beta}{2}+\pi(1-\pi)\beta(1-\varepsilon(d_{\ell}((a',a'),(1,0))))+\pi(1-\pi)(\beta\varepsilon(d_{\ell}((a',a'),(0,1)))-\kappa)+\pi^2(\frac{\beta}{2}-\kappa)$.

The penalty for lying and the probability of being caught can always be decreased enough to support a one-theme equilibrium and increased enough to preclude one. If $\pi = 0$, then (6) and (7) both become $\frac{1}{2} \geq \varepsilon(2x+1)$ which is true by definition. If instead $\kappa = 0$, then (6) becomes $\frac{1}{2}(1-\pi) + \pi(\varepsilon(d_\ell((a',a'),(0,1))) \geq \varepsilon(2x+1)$, which is true because $\varepsilon(d_\ell((a',a'),(0,1))) \geq \varepsilon(2x+1)$, and (7) becomes $\frac{1}{2} \geq (1-\pi)\varepsilon(2x+1) + \pi\varepsilon(\min\{2x,1\})$, which is true because both $\varepsilon(2x+1) \leq \frac{1}{2}$ and $\varepsilon(\min\{2x,1\}) \leq \frac{1}{2}$. (6) and (7) are always false when both $\pi = 1$ and $\kappa > \beta$.

There is good reason for a polity to avoid the one-theme equilibrium, which is relatively harmful to voter welfare. There is little to no opportunity for the voter to gain any worthwhile information with which to differentiate the candidates. In fact, the one-theme equilibrium optimal for voter welfare is counterintuitive. It isn't the equilibrium in which candidates choose the theme that departs most from expectations (a^* is defined in Chapter 2 as maximizing the utility difference $d_\ell(a',\varnothing)$ under naïve voting), but instead when they choose the antithesis of that theme ($-a^*$). This is because the voter only gains information when a candidate is caught lying, and never gains information about traits on the other dimension from the single theme *a'*.

A Truth-Telling Equilibrium

However, there is a truth-telling equilibrium in which the voter always has full information about whether the aforementioned theme a^* is true for each candidate, making it strictly better for voter welfare than any one-theme equilibrium. It is an extension of the truth-telling equilibrium described in Proposition 1 of Chapter 2, and it has already been demonstrated in the appendix to Chapter 2 that this is the most informative truth-telling equilibrium.

DEFINITION 7: *Truth-Telling Equilibrium*

Candidates choose the optimal theme a^* (defined as above) if it is true. If unable to use theme a^*, candidates choose the best theme from the opposite dimension, a^{**} (defined as whichever of the two maximizes the utility difference $d_\ell(a',\varnothing)$ under naïve voting). If unable to choose either of these two themes, candidates next choose $-a^{**}$ if true (the other theme on the same dimension as a^{**}), followed by $-a^*$ if true (the other theme on the same dimension as a^*), and then the redundant $-a^*$. If none of these are available, candidates do not campaign. Voter beliefs are established using the following rules in order:

a) If a candidate does not choose a^*, then a^* is false.

b) If a candidate does not choose a^* or a^{**}, then both a^* and a^{**} are false.

c) If a candidate is caught lying, both a^* and a^{**} are false for that candidate. Also, if the opponent campaigned with a^* which was not proven false, the voter believes that a^{**} would also have been true for the opponent. □

For example, suppose that the first choice theme (a^*) is negative campaigning, the second choice theme (a^{**}) is issue bolstering, and that candidate A negatively campaigns but is caught lying. If candidate B also negatively campaigns and isn't caught lying, the voter will assume that A has two undesirable traits $(\pm 1, -x)$ while B has none $(0, x)$. If instead candidate B uses issue bolstering and isn't caught lying, there is one resulting difference in voter posterior beliefs—the voter now knows that A is of good character because of B's failure to negatively campaign.

PROPOSITION 7: *The truth-telling equilibrium exists whenever conditions (8)* and (9) *hold:*

$$\beta(1-\pi)(\frac{1}{2}-\varepsilon(2x+1)) \le \pi\kappa \tag{8}$$

$$\beta(1-\pi)(1-\varepsilon(d_\ell(a^*,a^{**}))-\varepsilon(d_\ell(-a^*,a^{**}))) \le \pi\kappa\,. \tag{9}$$

Explanation and Proof. Equations (8) and (9) are the binding conditions that result from looking at every possible instance of candidate traits and the resulting incentives to deviate. First, I consider any candidate facing an opponent using the optimal theme a^*. The most disadvantaged of these is a candidate unable to campaign, and the best possible defection is to lie and choose a^*. If the bad candidate does not lie, the voter knows he has two bad traits $(\pm 1, -x)$ and that his opponent has two good traits. The chance of winning equals the chance of voter error, which is $\varepsilon(2x+1)$. But, after choosing the best possible lie (a^*) and getting away with it, the election is a tie. Thus for a candidate to tell the truth (i.e., not campaign) rather than lie, it must be true that $\frac{1}{2}\beta(1-\pi)+\pi(\varepsilon(2x+1)\beta-\kappa) \le \varepsilon(2x+1)\beta$. This can be rewritten as condition (8). Notice if there is no additional penalty (κ) for being caught, then candidates can lie without risk in this case, thus breaking the truth-telling equilibrium.

The next group of cases to consider are those in which a candidate who cannot use a^* truthfully is facing an opponent truthfully using a^{**}. Of these cases, a candidate has the most to gain from lying when he cannot truthfully choose either a^* or a^{**}, so must resort to $-a^*$, the strategy on the same dimension as a^*.[36] Truth-telling yields $\beta\varepsilon(d_\ell(-a^*,a^{**}))$, while lying yields $\beta(1-\varepsilon(d_\ell(a^*,a^{**}))$ if not caught and $\beta\varepsilon(d_\ell(-a^*,a^{**}))-\kappa$ if exposed. This results in truth-telling constraint (9). The penalty (κ) must exist to fulfill this condition.

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[36] $-a^*$ must be true because the opponent could not use a^* truthfully.

The final case to consider is with both candidates truthfully using -*a*** because *a** and *a*** would be false for both. Deviating to the optimal theme *a** is the best false option and results in a better expected outcome whenever $(1-\pi)\beta(1-\varepsilon(d_\ell(a^*,-a^{**}))+\pi(\frac{\beta}{2}-\kappa)>\frac{\beta}{2}$, so it appears that another requirement for truth-telling is:

$$\beta(1-\pi)(\tfrac{1}{2}-\varepsilon(d_\ell(a^*,-a^{**})))\le\pi\kappa. \tag{10}$$

However, since $\varepsilon(d_\ell(a^*,-a^{**}))\ge\varepsilon(2x+1)$, (10) follows from (8). ■

It is possible that both the truth-telling equilibrium and the one-theme equilibrium fail to exist, which is shown in the following example.

EXAMPLE 6: *One-theme and truth-telling equilibria fail to exist*

Suppose that the chance of voter error is about $\frac{1}{4}$ for all utility differences $d_\ell(\bullet)$ in equations (6)–(9) (for instance, let $\varepsilon(2x+1)=\frac{1}{4}$, and let the other $d_\ell(\bullet)$ equal $\frac{1}{4}+\mathrm{E}$ where E increases as the utility difference between the candidates decreases from $2x+1$.). Because $\varepsilon(d_\ell)$ is essentially flat for this range of d_ℓ values, (6) approaches $\beta(1-\pi)(\frac{1}{2}-\varepsilon(2x+1))>\pi\kappa$, which is the opposite of (8); thus in the limit, one of these equations will be true. And, in the limit, (9) is sufficient for truth-telling equilibrium existence because if (9) holds, then (8) also does. To see this, note that (9) approximates $\beta(1-\pi)(1-2\varepsilon(2x+1))\le\pi\kappa$ and that $1-2\varepsilon(2x+1)\ge\frac{1}{2}-\varepsilon(2x+1)$ whenever $0\le\varepsilon(2x+1)\le\frac{1}{2}$. Furthermore, (6) is sufficient for the

one-theme equilibrium because $(1-\pi)(\frac{1}{2}-\varepsilon(2x+1)) < \frac{1}{2}-\varepsilon(2x+1)$. If neither (6) nor (9) hold, both the one-theme and truth-telling equilibria fail to hold.

For the error function in this example, Figure 1 below shows the range of parameters for which these equilibria exist. These ranges are defined by the probability of being caught ($0<\pi<1$, on the X-axis) and the ratio between the penalty of being caught and the benefits of office ($\frac{\kappa}{\beta}$, on the Y-axis). The resulting shaded area shows where both equilibria fail to exist.

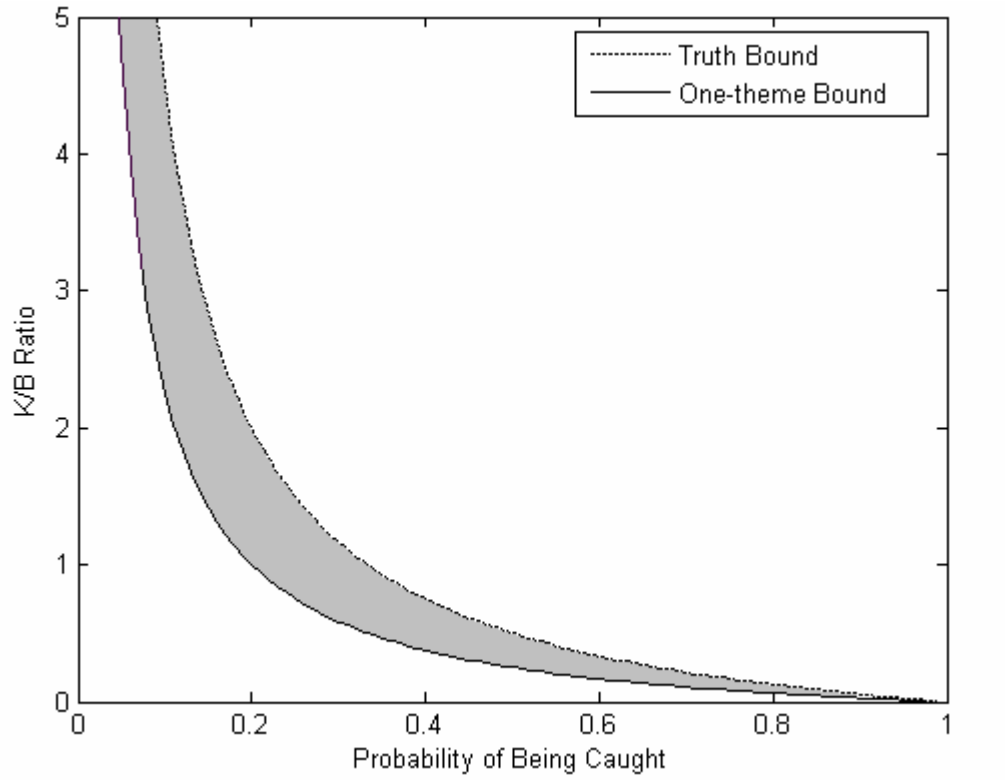

Figure 1: Range of parameters for equilibrium nonexistence

For example, suppose that $\pi = .25$. Figure 1 shows that neither of these equilibria hold whenever $1.0 \le \frac{\kappa}{\beta} \le 1.5$. For values of $\frac{\kappa}{\beta}$ above the truth bound, the penalty for lying is large enough so that the truth-telling equilibrium holds. For values of $\frac{\kappa}{\beta}$ below the one-theme bound,

the penalty for lying is small enough so the one-theme equilibrium holds; that is, lying and choosing *a'* is preferable to deviating by not campaigning. As the probability of being caught increases between 0 and $\frac{1}{2}$, the values of $\frac{\kappa}{\beta}$ for which these equilibria do not exist become smaller in range yet more plausible, since in politics we should expect that the political penalty for being caught lying is not many times greater than the benefit of holding office.

Changing the error function would also affect the range. Comparing $\varepsilon(d_\ell) \approx \frac{1}{4}$ to other flat error functions shows that the non-existence range of $\frac{\kappa}{\beta}$ decreases as the likelihood of error increases. In fact, when the flat voter error function approximates random choice, $\varepsilon(d_\ell) \approx \frac{1}{2}$, the truth-telling conditions (8) and (9) always hold.

Suppose finally that the error function becomes more sloped between $\varepsilon(2x+1)$ and the larger $\varepsilon(d_\ell)$ values. At first, the truth-telling equilibrium becomes more likely to hold, because (9) becomes less restrictive and (8) does not change. The total non-existence range also decreases until $\varepsilon(d_\ell((a',a'),(0,1))) + \varepsilon(\min\{2x,1\}) - \varepsilon(2x+1) \geq \frac{1}{2}$, when (7) instead of (6) becomes binding and thus the lower $\frac{\kappa}{\beta}$ bound starts to become more restrictive.□

Other Truth-Telling Equilibria

As in Example 4 from Chapter 2, there may also be a truthful equilibrium where candidates ignore the voter's campaign preferences. In this "a' equilibrium", candidates will, just as in Definition 7, choose a specific campaign theme (a') whenever it is true, but this time the theme a' is on the opposite dimension from the theme that would provide the largest deviation from voter prior expectations (a^*). Using notation, this means that a' is equal to either a^{**} or $-a^{**}$.

This alternative truthful equilibrium will be Definition 7 with the following changes: first, candidates choose a' whenever true. Second, candidates choose theme a'' (which equals either a^* or $-a^*$) whenever a^* is true and a' is false.

As compared to the Definition 7 "a^* equilibrium", the a' equilibrium lowers voter welfare and may be vulnerable to defection by truth telling.[37] But is it more vulnerable to defection by lying? Equations (8) and (9) can be updated so they apply to the a' equilibrium, by replacing a^* with a' and a^{**} with a''. Equation (8) is not affected regardless of which truth-telling equilibrium holds, so the answer depends upon equation (9). The term $\varepsilon(d_\ell(-a^*, a^{**}))$ (which is replaced by the analogous $\varepsilon(d_\ell(-a', a''))$ in the a' equilibrium) is from a situation where the voter has full information, so it is also not affected. Thus the only relevant comparison is that of $\varepsilon(d_\ell(a^*, a^{**}))$, $\varepsilon(d_\ell(a', a^*))$, and $\varepsilon(d_\ell(a', -a^*))$. First, I compare the two a' equilibria. The naïve voting equivalent of the difference between $\varepsilon(d_\ell(a', a^*))$ and $\varepsilon(d_\ell(a', -a^*))$ is $d_\ell(a^*, \varnothing) - d_\ell(-a^*, \varnothing)$, which is positive. So, the utility difference between the candidates is larger whenever $a'' = a^*$. Since larger differences encourage more lying, then the truth-telling constraint (9) is more relaxed when $a'' = -a^*$.

The comparison between the a^* equilibrium and the least vulnerable a' equilibrium (when $a'' = -a^*$) depends on the specific parameter values. Whenever, under naïve voting, $d_\ell(a^*, \varnothing) + 2d_\ell(-a^*, \varnothing) \geq 2d_\ell(a^{**}, \varnothing) + d_\ell(-a^{**}, \varnothing)$, then $\varepsilon(d_\ell(a^*, a^{**}))$ provides a larger

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[37] The two cases where voters have incomplete information are when the candidates reveal (a', a') and when the candidates reveal (a', a^*). In the first case, the potential utility difference with (a', a') in the *a'* equilibrium is larger than the potential difference with (a^*, a^*) in the a^* equilibrium; since both elections are ties, more utility is lost in the former equilibrium. In the latter case, (a', a^*) in the *a'* election causes the voter to choose the first candidate, but the first candidate could actually be the worse of the two once candidate traits are revealed. In contrast, for the analogous campaigns (a^*, a^{**}) in the a^* election, the voter chooses the first candidate whom will never end up being the worse candidate.

difference than $\varepsilon(d_\ell(a', -a^*))$, meaning that the a^* equilibrium is more susceptible to lying; otherwise the a' equilibrium (when $a'' = -a^*$) is more susceptible.

Thus, the agreed upon first choice campaign theme (a^* or a') has an ambiguous effect on candidates' incentives for truthfulness. So once again, we have a counterintuitive result: the goal to insure truthful campaigns is best accomplished by requiring candidates' second choice campaign theme to be as undiscriminating as possible.

Other Equilibria with Lying Candidates

To conclude the sophisticated voting analysis, I consider whether a different equilibrium exists when both the one-theme and truthful equilibria fail to exist. One intuitive possibility is that some equilibrium exists on the continuum between the truth-telling strategy and one-theme strategy. This artificial continuum would measure the number of cases in which at least one candidate will attempt to campaign falsely. In one such intermediate equilibrium, there are two campaign types, one on each dimension, which the candidates are willing to reveal if true. Candidates would then only resort to lying if both of these campaign options were false. This *two-theme equilibrium* is captured in the following definition.

DEFINITION 8: *Two-theme Equilibrium*

Candidates choose the optimal theme (a^*, defined earlier) whenever true, and if a^* would be false, choose campaign a^{**} (the optimal theme on the other dimension) whenever it is true. If both a^* and a^{**} are false, candidates lie and reveal a^*. Voter beliefs are established using the following rules in order:

a) If a candidate does not choose a^*, then a^* is false.

b) If a candidate is caught lying, both a^* and a^{**} are false for that candidate, and if the opponent campaigned with a^* which was not proven false, the voter believes that a^{**} would also have been true for the opponent.

c) If a candidate chooses not to campaign and the opponent chooses a^*, then a^{**} would also be true for the opponent.

d) If a candidate does not choose a^* or a^{**}, then both a^* and a^{**} are false, and if the opponent campaigned with a^* which was not proven false, then a^{**} would also have been true for the opponent.

The appealing quality of the two-theme equilibrium is the relationship between the campaign options. One option, if revealed, is always true—but an otherwise inferior choice. The other option, if revealed, could either be true or instead a desperate lie by a candidate in trouble. But, the conditions for existence of the two-theme equilibrium are numerous.

PROPOSITION 8: *The two-theme equilibrium exists whenever the following conditions hold:*

$$\beta\varepsilon(d_\ell((a^{**},a^*),(0,0))) > \tfrac{\beta(1-\pi)}{2} + \pi(\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0))) - \kappa) > \beta\varepsilon(d_\ell((\varnothing,a^*),(0,0))) \quad (11)$$

$$\tfrac{\beta}{2} > \beta(1-\pi)(1-\varepsilon(d_\ell((a^*,a^{**}),(0,0)))) + \pi(\beta\varepsilon(d_\ell((\varnothing,a^{**})) - \kappa) > \beta\varepsilon(d_\ell((\varnothing,a^{**})) \quad (12)$$

$$\pi\beta\varepsilon(d_\ell((a^{**},a^*),(0,0))) + (1-\pi)\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0))) > \tfrac{\beta}{2} - \kappa\pi > \tfrac{\beta}{2}\pi + (1-\pi)\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0))) \quad (13)$$

$$\tau_\ell((a_\ell^*, a_{-\ell}^{**}),(0,0))) \geq \tfrac{1}{2}. \quad (14)$$

The proof of Proposition 8 is in the appendix. ■

As with Proposition 7, the binding conditions result from looking at every possible instance of candidate traits and the resulting incentives to deviate. In all cases, candidates need to

be better off truthfully revealing the secondary option a^{**} than lying with a^{*}, but better off lying with a^{*} than not campaigning. These conditions are shown in equation (11) (when the opponent uses a^{*} truthfully), equation (12) (when the opponent uses a^{**}), and equation (13) (when the opponent uses a^{*} falsely). Finally, it is not even trivial that the gain from revealing a^{*} true is greater than the gain from revealing a^{**}. This is due to the possibility, from the voter's perspective, that the candidate revealing a^{*} could have been lying but not caught, while a candidate revealing a^{**} is known to be telling the truth. This is captured by equation (14).

However, the two-theme equilibrium is not a component of the gray area in Figure 1 where neither the one-theme nor the truth-telling equilibria exist. This is because $(13) \Rightarrow (7)$ and $(11) \Rightarrow (6)$. It is still possible that some other intermediate equilibrium could exist when the others fail to hold. Another example that seems promising is the near-truth equilibrium where candidates lie only if they have two undesirable traits $(\pm 1, -x)$ and are facing an opponent with two good traits $(0, x)$. For this equilibrium to exist, (8) must be false while (7), (14), and constraint (15) below must hold.

$$\frac{\beta}{2}(1-\pi) + \pi(\beta\varepsilon(d_{\ell}((a^{*}, a^{*}),(0,1))) - \kappa) < \beta\varepsilon(d_{\ell}((a^{*}, -a^{**}),(0,0))) \qquad (15)$$

Finally, note that there is a guaranteed pure strategy equilibrium regardless of all the parameter values, though it is quite simplistic. As briefly mentioned in an earlier section, this is the equilibrium where no candidates campaign.

PROPOSITION 9: *It is an equilibrium if both candidates do not campaign, and the voter assumes that any candidate campaigning has two bad traits* $(\pm 1, -x)$ *and his opponent has two good traits* $(0, x)$.

Proof: Defecting and choosing some $a' \neq \varnothing$ results in a decrease in utility for the deviator and/or an increase in utility for the non-deviator. This defection results in a greater likelihood of losing the election than the 50% chance when both candidates do not campaign. ■

Results: Elections with a Naïve Voter

Next, I discuss the naïve voter case. Truthful elections with a naïve voter have smaller utility differences between candidates than truthful elections with a sophisticated voter because the naïve voter usually gathers less information about candidate types from the campaigns. Because of this, the naïve voting truth-telling equilibrium would seem to be more protected against lying than its sophisticated counterpart. However, the naïve voter case is actually very different because choosing a campaign theme that directly contradicts that of the opponent now becomes a viable option for the candidates. Such conflict is now conceivable because the naïve voter does not use the candidates' strategies to help her determine which candidate has deviated.

If a voter receives conflicting information about one of the candidates' traits, such as one candidate positively campaigning while the other negatively campaigns, the voter cannot rationally believe both of the contradictory revelations. So, she must put some probability on which candidate is telling the truth. This scenario is problematic for the naive voter, who is unable to make Bayesian inferences, and thus must use some exogenous criterion to make this decision. I will discuss two possible decision criteria: choosing by campaign theme, and choosing by candidate credibility. In the former, with conflicting information she might, for example, always believe the positive campaigner. This paradigm can lead to cycles such as in the following example.

EXAMPLE 7**:** *Equilibrium Nonexistence*

Suppose that there is no chance of being caught lying ($\pi = 0$), and that the voter uses the following rules to sort out credibility conflicts. After [PC, NC] she believes the positive campaigner, after [PC, IB] she believes the issue campaigner, after [IB, NC] she believes the negative campaigner, and after [ID, *a*] she believes any other theme *a* over ID. If the two strategies are different, the candidate on the losing end will be better off matching the campaign style of his opponent. Clearly any [ID, *a*] is not an equilibrium. Also, [PC, PC] cannot be an equilibrium because of the incentive to switch to issue bolstering, [NC, NC] cannot be an equilibrium because of the incentive to switch to positive campaigning, and [IB, IB] cannot be an equilibrium because of the incentive to switch to negative campaigning. Hence, there is no pure strategy equilibrium. As this is basically an extended matching pennies game, allowing mixed strategies here would restore existence.□

The second voter decision-making method for dealing with contradictory campaigns is the focus of the remainder of this chapter. Here, the voter weighs the credibility of each candidate. Each candidate ℓ has an exogenously given credibility score γ_ℓ, which represents the candidate's campaigning ability, perhaps due to personal traits or the employment of a superior array of political consultants.[38] This measure of campaign ability is assumed separable from the character dimension, so I allow for candidates who are of low valence but excellent campaigners. The parameters γ are only relevant when the candidates provide the naive voter with conflicting information. Then, the voter believes candidate A over candidate B with a probability of $\rho_A = f(\gamma_A, \gamma_B) = f(\gamma_B, \gamma_A)$, where $\rho_A \in (0,1)$ and $\rho_B = 1 - \rho_A$. I assume that the function ρ is monotonic and that the first derivative $\rho' < 0$. So, as the difference between the candidates'

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[38] If this were a repeated game, the credibility score could be updated endogenously to reflect how often the candidate had been caught lying.

credibility scores increases, the voter becomes more likely to choose the candidate with the higher score. After the voter decides which candidate is telling the truth, she concludes that the other candidate has been dishonest about this particular theme, but makes no further inferences. Note that setting $\gamma_A = \gamma_B$ is tantamount to the naive voter flipping a coin whenever she faces conflicting information. To continue, I update the Naïve Voter Equilibrium from Chapter 2.

DEFINITION 9**:** *Naïve Voter Equilibrium*

The equilibrium concept for this game is fully cursed perfect Bayesian in pure strategies (Eyster and Rabin 2005). Thus, given the exogenous values (π, κ, γ), for each candidate ℓ and for the voter V, the equilibrium consists of:

(1) Candidate strategies $\tilde{s}_\ell(\theta_\ell, \theta_{-\ell}) \in \arg\max_\ell \omega_\ell(s_\ell, \tilde{s}_{-\ell}(\theta), \tilde{\tau}, \theta)$ where

$$\omega_\ell(s_\ell, \tilde{s}_{-\ell}(\theta), \tilde{\tau}, \theta) = \tilde{\tau}(s_\ell, \tilde{s}_{-\ell}(\theta)) + (1 - 2\tilde{\tau}(s_\ell, \tilde{s}_{-\ell}(\theta)))\varepsilon(d_\ell(s_\ell(\theta), \tilde{s}_{-\ell}(\theta)))$$

(2) Voter strategies $\tilde{\tau}(a, \varphi) \in \arg\max E_\mu U_V(\tilde{s}, \tau)$

(3) Voter posterior beliefs $\mu(\theta \mid a)$ which are identical to the voter's prior beliefs about the probability distribution unless either the candidate location is directly revealed by *a* or *a* is revealed as a lie. If *a* is revealed as a lie, the voter's posterior beliefs must include the opposite of *a*. □

A Naïve Voter Equilibrium always exists if $\pi = 1$; candidates must tell the truth, so the equilibrium described in Chapter 2 applies. So instead, I consider any case with $\pi < 1$. Now, there is no guarantee of existence in pure strategies. This is fairly straightforward when $\pi = 0$, as shown by the following proposition.

PROPOSITION 10: *If the monitor is nonexistent or completely inefficient ($\pi = 0$), and one of the candidates is a better campaigner ($\gamma_\ell \neq \gamma_{-\ell}$), then there is no equilibrium.*

The proof is in the appendix, and is illustrated by Example 8. ■

EXAMPLE 8**:** *Equilibrium Nonexistence Due to a Credibility Gap*

Let $\pi = 0$. Without loss of generality, assume that candidate B is a better campaigner, so $\gamma_B > \gamma_A$. Say that both candidates choose the same campaign type; WLOG, they both use negative campaigning. This cannot be an equilibrium because B will switch to positive campaigning $(C_B = x)$, creating an information conflict by "defending himself". Now, A is better off by matching B's choice of positive campaigning $(C_A = x)$, again making the election a tie. But now, B switches to negative campaigning $(C_A = -x)$, after which A reverts to negative campaigning $(C_B = -x)$, completing the cycle. This cycle is depicted in the flow chart below.

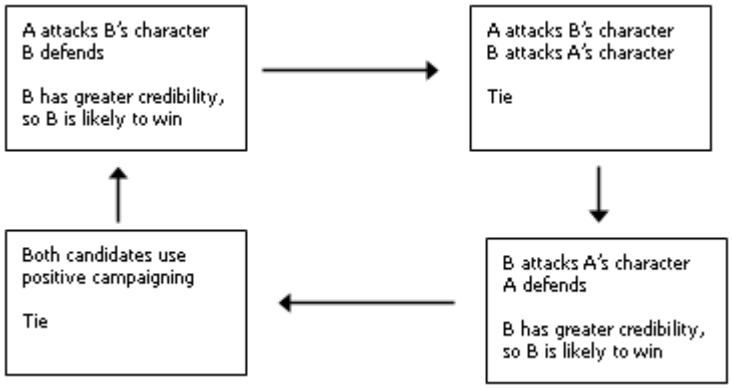

Figure 2: Credibility conflicts result in a cycle

As Figure 2 shows, the candidate with the higher campaign credibility will seek confrontation on a singular topic, while the candidate who is the inferior campaigner will try to ensure that the messages of the candidates do not conflict. The main cause of the cycle is actually the voter's lack of updating ability, which has resulted in her use of an exogenous criterion (γ) to

distinguish between candidates. So, candidates must instead use mixed strategies, just as was necessary in Example 7.□

In fact, the credibility conflicts cannot be part of *any* pure strategy equilibrium; this rule, along with its one exception, is shown in Proposition 11.

PROPOSITION 11: *Unless there is no chance of lies being exposed ($\pi = 0$) and both candidates have the same chance of winning a credibility conflict ($\rho_\ell = \frac{1}{2}$), then there is no equilibrium that includes a credibility conflict.*

The proof is in the appendix. ■

Equilibrium Characterizations

Equilibria under naïve voting are very diverse, and as a result, one can usually find a naïve voting equilibrium that comports with real election phenomena, even one with credibility conflicts if mixed strategies are admitted. To satisfy the Naïve Voter Equilibrium from Definition 9, a sufficient requirement is that candidates do not have the incentive to engage in a credibility conflict. For a truth-telling equilibrium, the requirements are stricter, so this is a departure from the Chapter 2 model which guaranteed exactly one naïve voting equilibrium.

To characterizing the naïve voting equilibria for this model, I introduce some additional notation. This notation ordinally organizes the five possible campaign revelations. Let $a^{(1)} = \max_{a \in \Sigma}(d_\ell(a,\varnothing),(0,0))$, and similarly define $a^{(m)} = \max_{a \in \Sigma / \{a^{(j)}\}}(d_\ell(a,\varnothing),(0,0))$ for $m \in \{2,3,4,5\}$ and $j < m$. Thus $a^{(5)} = \varnothing$, which is the case where the candidate will choose not to campaign. So, higher index numbers represent less effective campaign themes. While all of these revelations yield $d_\ell((a_\ell,\varnothing,(0,0)) \geq 0$, of course up to four of these may be lies.

We also need notation to differentiate true from false statements. In a slight abuse of the previous notation, let $a^{(m)}$ and $a^{(\tilde{m})}$ respectively represent the true and false versions of campaign theme *m*. Since true revelations and undiscovered false revelations have the same benefit, it follows that $d_\ell((a_\ell^{(m)},\varnothing,(0,0))) = d_\ell((a_\ell^{(\tilde{m})},\varnothing,(0,0)))$. Let $a^{(M)}$ generally refer to any campaign theme, true or false. $a^{(M)} = m$ and $a^{(M)} = \tilde{m}$ are both instances of $a^{(M)}$, where $a^{(M)}$ is true or false, respectively.

PROPOSITION 12: *The following is a truth-telling equilibrium with a naïve voter. Candidates choose the true campaign theme* $a^{(m)}$ *that maximizes the deviation from the voter's expected utility* $d_\ell(a_\ell,\varnothing)$. *If a candidate is caught lying, the voter believes the opposite of that candidate's statement. Also, the following conditions must hold whenever a theme is optimal (*$m \in \arg\max d_\ell(a_\ell^{(m)},\varnothing)$*), so that neither candidate has the incentive to create a credibility conflict (condition 2) or otherwise lie (condition 1):*

1. If $a^{(\tilde{k})} \neq -a^{(j)}$*, for all* $j \leq m \leq 5$, $1 \leq j \leq 3$ *and* $1 \leq \tilde{k} \leq 2$*:*

$$\beta(\pi\varepsilon(d_\ell(a^{(j)},\varnothing) + d_\ell(-a^{(\tilde{k})},\varnothing)) + (1-\pi)(1-\varepsilon(d_\ell(a^{(\tilde{k})},a^{(j)})) - \varepsilon(d_\ell(a^{(m)},a^{(j)}))) \leq \pi\kappa \qquad (16)$$

2. If $a^{(\tilde{k})} = -a^{(j)}$*, for all* $1 \leq j \leq 4$ *and* $1 \leq \tilde{k} \leq 4$*:*

$$\beta((1-\rho+\rho\pi)(\varepsilon(d_\ell(a^{(j)},\varnothing))) + \rho(1-\pi)(1-(\varepsilon(d_\ell(a^{(\tilde{k})},\varnothing)))) - \varepsilon(d_\ell(a^{(m)},a^{(j)}))) \leq \kappa(1-\rho+\rho\pi)\ . \qquad (17)$$

Explanation and Proof. Equations (16) and (17) together show the requirements so that candidates have no incentive to deviate from the equilibrium in order to lie. That candidates do not have any incentive to switch to different true themes has already been proven for the analogous equilibrium in Chapter 2. So, what remains to be shown is that candidates also have no incentive to deviate by choosing a false campaign. Given the opponent's true statement,

candidates must not have the incentive to choose any false statement, of which two are relevant: the optimal lie that initiates a credibility conflict, and the optimal lie that does not.

If the lie will not contradict the opponent, the candidate with an inferior truthful option (i.e., that with a higher index) will have at least as strong an incentive to lie as the candidate with the superior truthful option (i.e., that with a lower index). In the truth-telling equilibrium, at least one candidate will be able to choose one of $\{a^{(1)}, a^{(2)}, a^{(3)}\}$, so in equation (16), j represents the index for the campaign of the advantaged opponent. Thus the best truthful option for the potential liar is such that ($m \geq j$) and $m \in \arg\max d_\ell(a_\ell^{(m)}, \varnothing)$. Furthermore, the best lying option $\tilde{k}$ that does *not* create a credibility conflict ($a^{(\tilde{k})} \neq -a^{(j)}$) will be in the set $\{a^{(\tilde{1})}, a^{(\tilde{2})}\}$.[39,40] $\varepsilon(d_\ell(a^{(j)}, \varnothing) + d_\ell(-a^{(\tilde{k})}, \varnothing))$ represents the chance of winning if found guilty of lying, which is the chance of a naïve voter making a mistake after the truth-teller's revelation $a^{(j)}$ and the opposite of the liar's attempted revelation $-a^{(\tilde{k})}$, both which are favorable to the same candidate. $(1-\varepsilon(d_\ell(a^{(\tilde{k})}, a^{(j)}))$ represents the odds of winning if the lie $a^{(\tilde{k})}$ is not discovered; this value will be at least $\frac{1}{2}$. The value $\varepsilon(d_\ell(a^{(i)}, a^{(j)}))$ is the chance of winning by staying with a truth-telling option, which only happens with voter error (which equals $\frac{1}{2}$ when candidates reveal the same theme).

The candidates also must have the incentive to avoid a credibility conflict, which is shown in equation (17). In this case, any candidate, if he is winning or losing in the truthful equilibrium, could have the incentive to switch from the best truthful option

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[39] Recall that the negative of a theme is defined as the opposite theme on the same dimension. For example, if $a^{(j)}$ is negative campaigning, then $-a^{(j)}$ is positive campaigning.

[40] The false statement, if revealed true, must yield as much as the true statement, and is thus limited to $\{a^{(\tilde{1})}, a^{(\tilde{2})}\}$. But, if the non-deviating opponent's best option is $a^{(3)}$, then $a^{(3)}$ is true for both opponents.

$i \in \arg\max d_\ell(a_\ell^{(i)}, \varnothing)$, so (17) must hold for all of $1 \le j \le 4$ and $1 \le \tilde{k} \le 4$ when $a^{(\tilde{k})} = -a^{(j)}$; index $a^{(5)}$ is omitted because an opponent not campaigning is immune from potential credibility conflicts. In (17), the dishonest candidate has the probability $(\varepsilon(d_\ell(a^{(j)}, \varnothing)))$ of winning the election after losing a credibility conflict, and the probability $1 - \varepsilon(d_\ell(a^{(\tilde{k})}, \varnothing))$ of winning the election after winning a credibility conflict.

All defection possibilities have been addressed. So, if equations (16) and (17) hold whenever candidates maximize $d_\ell(a_\ell, \varnothing)$ using only truthful revelations $a^{(i)}$, then this is a pure strategy equilibrium. ■

Since avoiding credibility conflicts is so important to naïve voter elections, following is an example of how the credibility constraint works in practice. Figure 3 depicts how the benefits from instigating conflict vary with both campaign ability and the efficacy of the independent monitor.

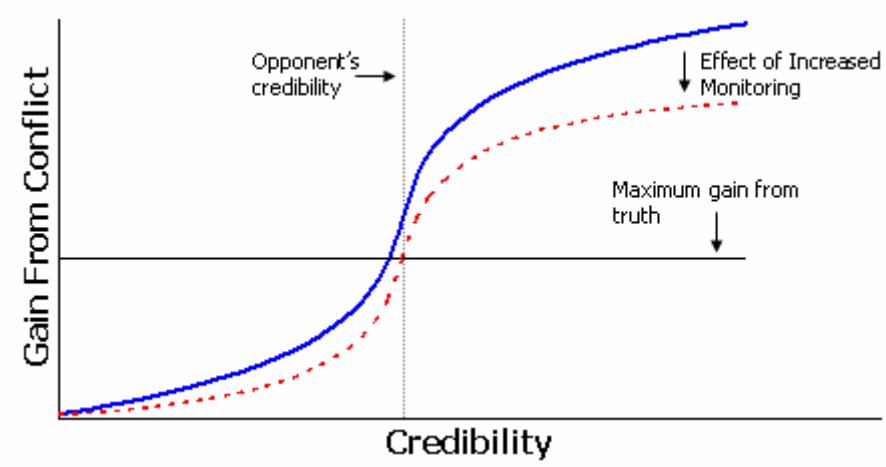

Figure 3: Monitoring and Credibility Conflict

The solid curve indicates the gain from creating a credibility conflict, which increases along with a candidate's campaign credibility γ_ℓ. The vertical line shows the opponent's

credibility $\gamma_{-\ell}$, which here remains constant. For emphasis, I have assumed a functional form with $p'' < 0$, so the gains from widening credibility differences are decreasing.

The horizontal line in Figure 3 represents the maximum gain from truth telling given the candidates' types θ. Below this threshold, honesty will prevail. Movement of the solid curve down toward its new location (dashed curve) shows the effect of a slight increase in π, the effectiveness of the monitor. As monitoring improves, the maximum net gain from credibility conflict will eventually be pushed below the truth threshold for all but the highest campaign credibility differentials. Whenever the gain from conflict is lower than the truth threshold, the credibility conflict avoidance requirement (17) is met.

The following proposition formalizes that a sufficient condition for some equilibrium to exist is that there are no incentives for credibility conflict.

PROPOSITION 13: *Given candidate types θ, let Ω denote the set of all campaign theme pairs $\{(a_\ell^{(M)}, a_{-\ell}^{(J)}, \theta)\}$ where $a_\ell^{(M)}$ is the best non-conflicting response when the opponent reveals $a_{-\ell}^{(M)}$ [41]. Then, it is an equilibrium when for each $(a_\ell^{(M)}, a_{-\ell}^{(J)}, \theta) \in \Omega$ where $(a_\ell^{(J)}, a_{-\ell}^{(M)}, (\theta_{-\ell}, \theta_\ell)) \in \Omega$, the following conditions hold for the candidate (ℓ) with higher credibility:*

1. *If $a_\ell^{(M)}$ and $a_{-\ell}^{(J)}$ are true, then:*

$$\omega_\ell(a_\ell^{(m)}, a_\ell^{(j)}, \tilde{\tau}, \theta) \geq \omega_\ell(-a_\ell^{(j)}, a_\ell^{(j)}, \tilde{\tau}, \theta, \rho_\ell) - (1 - \rho_\ell + \rho_\ell \pi)\kappa \tag{18}$$

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[41] The best non-conflicting response $a^{(m)}$ satisfies $a^{(m)} \in \max_{a^{(m)} \neq -a^{(j)}} \{d_\ell(a^{(m)}, \varnothing)\xi + (1-\xi)((1-\pi)d_\ell(a^{(\tilde{m})}, \varnothing) + \pi(d_\ell(a^{(\tilde{m})}, \varnothing) - \kappa))\}$, where $\xi = 0$ if the campaign *m* is false (and thus notated by $a^{(\tilde{m})}$), and $\xi = 1$ if the campaign *m* is true (and thus notated by $a^{(m)}$).

2. *If* $a_{\ell}^{(M)}$ *is false and* $a_{-\ell}^{(J)}$ *is true, then:*

$$\omega_{\ell}(a_{\ell}^{(\tilde{m})}, a_{\ell}^{(j)}, \tilde{\tau}, \theta) \geq \omega_{\ell}(-a_{\ell}^{(j)}, a_{\ell}^{(j)}, \tilde{\tau}, \theta, \rho_{\ell}) - (1-\rho_{\ell})\kappa \tag{19}$$

3. *If* $a_{-\ell}^{(J)}$ *is false, then* **:**

$$\omega_{\ell}(a_{\ell}^{(M)}, a_{\ell}^{(\tilde{j})}, \tilde{\tau}, \theta) \geq \omega_{\ell}(-a_{\ell}^{(\tilde{j})}, a_{\ell}^{(\tilde{j})}, \tilde{\tau}, \theta, \rho_{\ell}). \tag{20}$$

The proof is in the appendix. It presents an algorithm that will always find an equilibrium as long as the conditions of Proposition 13 hold. ■

Again, the key point is that only the threat of credibility conflicts can create a cycle. As long as the best response to an opponent's campaign does not involve creating such conflict, then the opponent's campaign choice does not otherwise impact one's own campaign choice. So, if these conflicts are not optimal campaign choices in any situation, then the algorithm presented in the appendix guarantees existence. However, the existing equilibrium does not need to be the truth-telling equilibrium, nor does it have to be unique. The following examples demonstrate this, starting with an instance where truth telling holds.

EXAMPLE 9: *A Truth-Ttelling Equilibrium*

Let $p = q = \frac{1}{3}$, $x = \frac{1}{2}$, $\rho_A = \frac{3}{5}$, $\rho_B = \frac{2}{5}$, and the office holding benefit $\beta = 1$. Also, let the probability of being caught lying be $\pi = \frac{1}{2}$ along with a penalty of $\kappa = \frac{1}{5}$. So, the odds of being of positive character are $\frac{1}{3}$, as are the odds of being on either ideological extreme. Candidate A is more likely to win a credibility conflict (60%). Here, the expected voter utility before campaigning is -0.83 for each candidate. The biggest possible change in voter utility comes from positive campaigning; if the voter knows for certain that a candidate is of good character (*x*), her

utility for that candidate increases by 0.67. A simple voter error function, $\varepsilon(d_\ell) = \frac{1.34 - d_\ell}{2.68}$, insures that the chance of voting for the wrong candidate lies between 0 and $\frac{1}{2}$. With these values, (16) and (17) hold, so the candidates will tell the truth in equilibrium, with candidates preferring in order $a^{(1)} =$ positive campaigning, $a^{(2)} =$ issue bolstering, $a^{(3)} =$ issue differentiation, $a^{(4)} =$ negative campaigning, and as always, $a^{(5)} = \varnothing$. □

EXAMPLE 10: *An Equilibrium With Lying Candidates*

In Example 9, suppose we reduce the likelihood of being caught lying to $\pi = \frac{1}{4}$ while leaving all the other variables unchanged. This alters candidate strategies. In the case where a candidate with two poor traits $(\pm 1, -x)$ faces a strictly superior candidate $(0, x)$, the inferior candidate now will lie, using positive campaigning. This is because the expected value from lying increases from 0.21 to 0.36, while the expected value from not campaigning remains at 0.25. This is an equilibrium because the credibility conflict restraint still holds. Lying with negative campaigning against the positively campaigning opponent now yields an expected value of 0.35 (if A is the inferior candidate, or 0.31 if B is inferior), which is better than that from not campaigning (0.25), while both are inferior to lying with positive campaigning. Now, when a $(\pm 1, -x)$ candidate faces a $(0, x)$ candidate, the two campaign themes will actually look the same, and unless the lie is uncovered, the election will be a tie.

Further reducing the likelihood of being caught, to $\pi = \frac{1}{10}$, still produces an equilibrium, though it includes even more false revelations. Now, regardless of his opponent's traits, any candidate with two bad traits $(\pm 1, -x)$ will lie via positive campaigning. Deviation to create a credibility conflict is never optimal.

However, for each of the cases in this example ($\pi = \frac{1}{4}$ or $\pi = \frac{1}{10}$), if we increase the credibility of candidate A so that his probability of winning a credibility conflict increases to $\rho_A = \frac{3}{4}$, this destroys the equilibrium. If $\pi = \frac{1}{4}$, a cycle occurs whenever Candidate A is $(\pm 1, -x)$ facing a $(0, x)$ opponent. Candidate A will prefer to directly oppose Candidate B's statement, while if a conflict exists, B will benefit from any of the three campaign themes that do not directly oppose A. This results in a cycle just as the one presented in Figure 2. However, the lack of equilibrium is not confined to the $(\pm 1, -x)$ facing $(0, x)$ case. When $\rho_A = \frac{3}{4}$ and $\pi = \frac{1}{10}$, the $(\pm 1, -x)$ versus $(0, x)$ case does *not* cycle because A would prefer to lie with positive campaigning rather than oppose B. The conflict cycle affects the case with two $(\pm 1, -x)$ candidates instead. □

EXAMPLE 11: *Multiple Equilibria*

Let $p = \frac{2}{5}$, $q = \frac{1}{3}$, $x = 2$, $\rho_A = \rho_B = \frac{1}{2}$, and the office holding benefit $\beta = 1$. Also, let the probability of being caught lying be $\pi = \frac{1}{10}$ of being caught lying along with a penalty of $\kappa = \frac{1}{5}$. So, the odds of being of positive character are $\frac{2}{5}$ and are the odds of being on each ideological extreme are $\frac{1}{3}$. The candidates are equally likely to win a credibility conflict.

In this example there are multiple equilibria. In equilibrium, either both candidates positively campaign or both candidates negatively campaign. Whether the candidates both choose positive or both choose negative campaigns is irrespective of the different θ realizations. For instance, when both candidates have positive traits, they could both choose to lie and depict the opponent as having negative character traits. This decision would have no impact on the other θ cases. This is because regardless of the equilibrium, deviation to any issue campaign is

inferior, and the alternative character campaign would result in a credibility conflict that is less desirable for both candidates in the context of the previous analysis. □

Finally, I revisit the consequences of eliminating negative campaigning. One clear ramification is the impossibility of a credibility conflict on the character dimension, thus eliminating some of the equilibrium existence constraints. But, a major drawback is that previously honest candidates who would have used negative campaigning may be more likely to lie when they choose a new campaign.

Yet, if the goal is to reduce the amount of dishonest campaigning, then sometimes it can be worthwhile to conflate lies and negative campaigning. Whenever voters are most likely to respond to negative campaigning (i.e., it would create the largest swing in voter utility), it also becomes more likely that negative campaigners are liars as well. But, this approach can backfire just as in Chapter 2, Example 3. It would be better instead to improve truth monitoring and let the election otherwise play out. Improving monitoring never hurts voter welfare. When eliminating campaign options, the welfare effect depends upon which campaigns will be chosen by candidates whose first choice has been banned.

Discussion

We know from centuries of politics that not all negative campaigns are the same, nor are all candidates equally successful in going negative. Here, I have shown how reducing candidates' ability to falsify information would lead to better candidates being elected, which is not necessarily the case when campaign options are stifled. Pointing out an opponent's actual lack of experience is better for voter welfare than falsifying experience for oneself. The analysis shows that it is important for voters to really be clamoring for honest rather than positive campaigns. When candidates can lie without risk or penalty, all candidates will campaign in the same way

regardless of their underlying types. Identical and likely untrue campaign would undoubtedly frustrate voters as well. In Chapter 5, I discuss the degree to which voters can make the distinction between relevant and irrelevant negative campaigning.

Also, if lying entails some risk, I have shown that there will be fewer false campaigns in closer elections, which contradicts the often-professed belief that the most egregious examples of nonsubstantive negativity occur in the most competitive races (Sabato and Simpson 1996). But, there is less reason for candidates with reasonably high chances of winning to gamble on false campaign statements than for candidates who otherwise would be hopelessly behind. In close elections, candidates will play to their strengths (or the opponent's weaknesses) rather than taking huge risks in campaign strategy that seem more likely to disillusion voters than ingenuous revelations of an opponent's character weaknesses.

Of all the issues raised in this study, the biggest hurdle to overcome is instituting a system in which fact-checking can be effectively and honestly administered. When voters are forced to rely on an external benchmark such as candidate credibility to resolve information conflicts, undesirable candidates who nevertheless are great campaigners will benefit.[42] Conversely, candidates with good character and favorable policy positions but with bad campaigning skills will be hurt the most by direct campaign conflict, and so they will be the strongest proponents of third-party ad monitoring. Unfortunately, since these people are not the best campaigners, will the public listen to their pleas?

One potentially informative extension to this model involves allowing the candidates themselves to allocate resources toward disinterring an opponent's lie. This fact-checking could be either to defend oneself against a negative attack or dispute an opponent's positive claims, and candidates' choice to try this may also depend upon the efficacy and motivation of the third-party

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[42] For instance, if candidates are forced to use mixed strategies, the inferior candidate has a better chance of winning— specifically when the opponent ends up *ex post* choosing the "wrong" theme.

monitors. A two-stage model can be used to integrate this. For example, the candidates would first campaign simultaneously, but then would have a second round to either introduce new information or rebut the opponent's previous claim. Such sequential rather than simultaneous campaigning could be used to study candidates' attempts to refute an opponent's slander. Might it matter whether candidates are responding to rather than initiating contentious campaign themes? Also, how does this analysis depend upon the accuracy of the claim being disputed and the ability of the candidates to offer convincing proof otherwise?

Chapter 4

Attack Politics: Experimental Evidence

In the second part of this study I use multiple empirical methods in order to test the predictions and implications of the formal theory explicated in Chapter 2. In this chapter, I translate the general campaigning game into a laboratory setting; subjects play the roles of the candidates and voter, and I use these to test the three major comparative statics results from the general formal model. The subsequent chapters use different methods to gain new information about negative campaigning that compliments the formal model and laboratory experimental evidence. Chapter 5 is an expository essay on how voters respond to negative campaigning. The general public purportedly hates negative campaigning, but yet it appears that they are often swayed by negative advertising. In the formal model, negative campaigning is less effective if the voter perceives it as not credible, if the voter does not deem valence characteristics important, or if the voter initially assumes that all candidates have negative valence. Using survey data, I explore to what extent people are interested in negative valence topics, and which types of voters are most likely to respond to these types of campaign themes. Chapters 6 and 7 move beyond the formal theory of campaign strategy and into the area of campaign tactics. Using both neurological and behavioral psychology experimental methods, these chapters show how inducing voter fear of the opponent is correlated with voter decision-making. Finally, Chapter 8 uses data from the American National Election Survey (ANES) to combine and expand upon the two lines of research initiated in Chapters 5–7. Here, I analyze both which types of voters are more susceptible to fear campaigns and whether the invocation of fear had a direct effect on the past seven Presidential elections.

I begin the second part of this study with laboratory evidence designed to address the question "Who goes negative and why?" Because of divergence in the quality and ideology of political candidates, it is unreasonable to assume that every candidate has the same incentive or opportunity to utilize negative campaigning. Instead, the decision of whether to "go negative" is based upon a number of factors, and the end result is that candidates will go negative with different content, to different degrees, and with different results.

The previous chapter posited three reasons why candidates would be more likely to choose negative campaigning. First, negative campaigning should be more likely when the voters' prior beliefs about political candidates in general become more positive. Second, we should see more negative campaigning on political dimensions where the candidates are weakest. Third, negative campaigning should be more likely on the dimensions of greatest importance to the voters.

The latter two predictions are rather straightforward to test, but the first seems contrary to the conventional wisdom that because negative campaigning has become more prominent in recent years, voters' opinions of politicians and trust in government has steadily declined. For instance, as of June 2007, Congress and the President had similar approval ratings of 25% and 26% respectively.[43] However, voters' opinions before the campaigns begin can differ substantially from their post-election viewpoints. In accordance, this model focuses not on voters' opinions of candidates already in office, but instead on the voters' prior beliefs about the character (or valence) of essentially unknown political candidates. And it is for unknown candidates that voters still maintain hope. In fact, evidence shows that evaluations of a hypothetical person exhibit a *positivity offset*—a tendency to be slightly positive rather than neutral in the absence of information (Adams-Weber 1979; Benjafield 1985); this same effect has

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[43] This data was taken from http://www.pollingreport.com and was originally part of a Newsweek Poll administrated on June 18th-19th, 2007. These numbers are similar to those of other polls taken in the same time frame.

also been demonstrated in evaluations of unknown political candidates (Holbrook et al. 2001).[44] The positivity offset, along with the fact that voters care greatly about character issues (e.g., Cain et al. 1987), can help in understanding the high frequency of negative campaigning and specifically of character-based attack. Character attacks, even if true, would give the voters no new information if they already think that every political candidate is of poor quality, or if they don't care about character traits of politicians in the first place.

That politicians can effectively use negative campaigning to transmit information to the voters has been shown by Geer (2006) and also via the formal model of Polburn and Yi (2006). The effect of negative information has also been shown in the psychology literature. Impressions formed on the basis of negative information tend to be weighted more heavily (Hamilton and Zanna 1972; Fiske 1980), and people exhibit loss aversion consistently throughout their personal lives (Kahneman and Tversky 1979, 1984). In a political setting, Cobb and Kuklinski (1997) found that opinions formed after hearing "con" arguments are longer lasting and more resistant to change than those formed after hearing advocacy arguments. Cacioppo and Gardner (1999) suggest a general bias toward negative information, though there is some evidence that when evaluating political candidates, favorable information can be weighted more heavily than negative (Holbrook et al. 2001).

When considering the role of campaigns in information revelation, an important issue is the extent to which voters engage in Bayesian updating after receiving the information—whether or not they consider the implications about candidate types that can be derived from the information the candidates did *not* reveal. Failure to Bayesian update has been shown formally, in the context of the winners' curse, by many including Thaler (1988), and also demonstrated in

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[44] Also, note the survey results reported in Chapter 5 from the October–November 2006 Cooperative Congressional Election Study (CCES). 70% of CCES respondents believed that candidates running for national office were generally competent, and 55% of respondents believed that candidates for national elected offices were trustworthy.

laboratory auctions (e.g., Kagel 1995; Kagel and Levin 2002). Milgrom and Roberts (1986) explain that in games of information revelation, the effect of decision-making ability on the outcome depends upon the extent of competition and the incentives to increase social welfare. Alvarez (1998) showed how campaign information that provides the voter with certainty on a particular dimension will be most preferred by risk-averse voters with uncertain priors.

This study uses laboratory experiments to test the predictions of Chapter 2 using a three player game in which two candidates campaign by revealing information to one voter. This model predicts that the incidence of negative campaigning depends upon three factors:

(1) The preconceptions of the voters: All other things equal, negative campaigning is more likely when the voters have more positive initial opinions of the attacked candidate's character.

(2) The traits of the candidates: All other things equal, there will be more negative campaigning as the candidates decrease in character quality.

(3) The preferences of the voters: All other things equal, there will be more negative campaigning on a given dimension whenever voters care more strongly about that dimension.

From this experiment, I find evidence to verify these three comparative statics hypotheses. The formal model in Chapter 2 also presented equilibria that depend upon the sophistication (i.e., Bayesian updating ability) of the voter. This experiment tests what equilibrium candidates and voters are playing, and uses that to determine the extent to which the voters are updating.

However, subjects' behavior does not always match the expected equilibrium behavior. In order to account for these anomalies, I include voter risk aversion, and I also utilize a stochastic choice version of the Cursed Equilibrium concept of Eyster and Rabin (2005), which posits that voter behavior lies somewhere in between the estimates provided by the naïve and

sophisticated models. As a structure for testing these, I use an extension to Bayesian equilibrium called Quantal Response Equilibrium (McKelvey and Palfrey 1995), which allows the voters to make mistakes that increase in likelihood as the expected utility difference between the choices decreases, and allows candidates to choose strategies based upon this awareness of voter behavior. I find that the model estimating risk aversion and cursed equilibrium parameters within a QRE structure provides the best fit with the data. It shows that voters tend toward naïve rather than sophisticated behavior—they use the information revealed to them but ignore inferences that could be derived from the information each candidate failed to reveal. Furthermore, I find that voters, being risk averse, prefer the revelation of positive rather than negative information. These results provide insight regarding the questions of which candidates tend to engage in negative campaigning, and what scenarios make them most likely to do so.

Experimental Design

The experiments were conducted in May and June 2007 at the California Institute of Technology, in the Social Science Experimental Laboratory (SSEL) using software developed at SSEL.[45] Subjects were recruited from the population of graduate and undergraduate students at Caltech and performed all tasks from a computer terminal.

Subjects were divided randomly into groups of three in which two played the role of candidate and one played the role of voter; roles and groups were reassigned after every round. Both candidates were randomly assigned traits on two independent dimensions, X and Y. There were two possibilities for each trait: "positive" or "negative", and the probability of drawing a

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[45] For more information about the Caltech Social Science Experimental Laboratory, see http://www.ssel.caltech.edu/info/. The computer program used was an extension to the open source Multistage game software. See http://multistage.ssel.caltech.edu for more information on this program.

positive trait was either 30%, 50%, or 70%. While the candidates were aware of the prior probabilities and both candidates' type draws, the voters were aware of the probabilities but not the realization of the candidates' traits.

The game consisted of two phases. In the first phase, candidates campaigned by revealing one of the four traits to the voter, but were also given a choice not to campaign. This gave candidates five campaigning options which were revealing one's own X trait, one's own Y trait, the opponent's X trait (heretofore abbreviated as oX), the opponent's Y trait (heretofore abbreviated as oY), or revealing nothing (heretofore, Ø). An example of the campaign choice screen seen by the candidates is shown by Figure 15 in the appendix.

Each voter simultaneously received the choices of both candidates and was then asked to vote for her preferred candidate. An example of the voter choice screen is shown by Figure 16 in the appendix. The vote concluded the round, after which the voters were shown their own payoff and both candidates' types.[46] Then, all players were reassigned groups and roles for the subsequent round. During the course of the game, a player had available the history of all previous rounds in which he had participated.

Payoffs were contingent upon the results of each round. The winning candidate received 100 points, the losing candidate received 0 points, and as shown in Table 2 below, the voter received a higher payout for choosing candidates who were positive on X (80) than for candidates positive on Y (20).

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[46] The on-screen text for voters stated, "You voted for [Candidate]. [Candidate] had a [positive/negative] X trait and a [positive/negative] Y trait, so you were paid [payoff]. The traits of both candidates are now available on the history panel below." For candidates, the text stated, "You were the [winning/losing] candidate, and were therefore paid [payoff]. The election results are now available on the history screen below."

Table 2: Voter Payoff Table

	Positive on Y	Negative on Y
Positive on X	100	80
Negative on X	20	0

The final subject pool consisted of 48 subjects, all of whom participated in exactly one of four sessions, with between 9 and 15 subjects participating in each. Detailed instructions were read to the subjects prior to the first round; these included a visual display of example screen shots (Figure 15 and Figure 16) from the software application.[47] Each session consisted of 60 rounds, and all three treatments (30%, 50%, and 70%) were used in each session. The probability and payoff information was always available on screen to all players, and the subjects were verbally reminded whenever the treatment had changed. The order of the three treatments varied by session and is summarized in Table 3.

Table 3: Experiment Session Summary

	Session 1	Session 2	Session 3	Session 4
Number of Subjects	9	15	15	9
Order of 30% Treatment	2nd	3rd	1st	3rd
Order of 50% Treatment	1st	2nd	2nd	1st
Order of 70% Treatment	3rd	1st	3rd	2nd

At the conclusion of the experiment, the points earned were converted to cash. The subjects earned an average of $25 for their participation.

[47] These instructions are in the appendix.

Hypotheses and Tests

I begin by testing the comparative statics results derived from the theoretical model. In the analysis of this experiment, I define oX and oY as separate types of campaigning against the opponent (assume that X is the character dimension). This results in the following three hypotheses:

(H1) **Positivity Offset Hypothesis**: For each type draw, candidates are more likely to choose to reveal negative information as the probability of drawing a positive trait increases from 30% to 70%.

(H2) **Poor Candidate Hypothesis**: There should be the most negative campaigns in the 30% treatment, and the fewest negative campaigns in the 70% treatment.

(H3) **Dimension Preference Hypothesis**: As dimension X more greatly affects voter payoffs, there will be more negative campaigning on dimension X than negative revelations (issue differentiation) on dimension Y.

The next two hypotheses address the decision-making sophistication of the voters. To determine this, it is necessary to find which of the possible equilibria best fits the data.

(H4) **Naïve Voting Hypothesis**: The voters assume that candidates' decisions *are not* based upon their types. As a result, voters and candidates are playing the naïve equilibrium described below and shown in Table 4.

(H5) **Sophisticated Voting Hypothesis**: The voters assume that candidates' decisions *are* based upon their types. As a result, voters and candidates are playing one of the sophisticated equilibria described below and shown in Table 5.

Assuming that the voters are naïve, Table 4 shows candidate strategies for the sixteen possible type draws. In the table, the letters X and Y refer respectively to revealing one's own X trait and one's own Y trait; oX and oY refer respectively to revealing the opponent's X or the opponent's Y trait. The 50% treatment is excluded from this table because with a naïve voter, any combination of the strategies for the 30% and 70% treatments results in equilibrium.

Table 4: Candidate Equilibrium Strategies with a Naïve Voter

Self	Opponent	30% treatment	70% treatment
(+, +)[48]	(+, +)	X	X
(+, +)	(+, -)	X	X
(+, +)	(-, +)	X	oX
(+, +)	(-, -)	X	oX
(+, -)	(+, +)	X	X
(+, -)	(+, -)	X	X
(+, -)	(-, +)	X	oX
(+, -)	(-, -)	X	oX
(-, +)	(+, +)	Y	Y
(-, +)	(+, -)	Y	oY
(-, +)	(-, +)	oX	oX
(-, +)	(-, -)	oX	oX
(-, -)	(+, +)	Ø	Ø
(-, -)	(+, -)	oY	oY
(-, -)	(-, +)	oX	oX
(-, -)	(-, -)	oX	oX

Legend:

X Reveal one's own positive X trait
Y Reveal one's own positive Y trait
oX Reveal the opponent's negative X trait
oY Reveal the opponent's negative Y trait
Ø No campaign

The naïve voter strategies are derived as follows. In the 30% treatment, if a candidate ℓ reveals that he is positive on X, the naïve voter's expected earnings from voting for ℓ increase from 30 to 86. If ℓ reveals his opponent, $-\ell$, to be negative on X, the voter's expected earnings for

[48] In this and future tables, traits are listed in the order (X trait, Y trait).

choosing -ℓ decrease from 30 to 6. Because the net change in voter utility from revealing X is higher, the candidates should prefer to reveal X rather than oX. Furthermore, if candidate ℓ reveals that he is positive on Y, this changes the voter's expected earnings for ℓ from 30 to 44, which makes a revelation of oX preferable to a revelation of Y. Finally the oY revelation changes earnings from a -ℓ vote from 30 to 24, the smallest change in expected earnings of the four campaign options. Thus in the naive equilibrium for the 30% treatment, we should expect candidates to choose campaigns in the order (X, oX, Y, oY). However, when the prior probability of being positive changes from 30% to 70%, the benefits from positive and negative campaigns are reversed.[49] So in this treatment, we should expect candidates to choose campaigns in the order (oX, X, oY, Y).

The sophisticated voting equilibria, presented in Table 5 below, were derived from Proposition 1 and Proposition 14 in Chapter 2. They are similar to the naïve voting equilibria from Table 4 in that candidates' decisions are based upon an ordering of the possible disclosures. But here, candidates strategies and voter beliefs will coordinate on a particular revelation *a'* which can be either X or oX. If *a'* is false, then candidates, whenever possible, will choose a particular revelation *a''*, which is either Y or oY. The sophisticated voter will assume *a'* is not true if *a'* is not chosen, and also that *a''* is not true whenever neither *a'* nor *a''* is chosen. As indicated above, in this experiment there are four possible configurations of *a'* and *a''* from which candidates have no incentive to defect.[50] The four strategies are named based on the

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[49] In the 70% treatment, if candidate ℓ reveals oX , the voter's expected earnings from voting for -ℓ decrease from 70 to 14, while if ℓ reveals X, the voter's expected earnings for ℓ increase from 70 to 94. Furthermore, if ℓ reveals oY, then the voter's expected earnings for -ℓ decrease from 70 to 56, and if ℓ reveals Y, the voter's expected earnings for ℓ increase from 70 to 76.

[50] Any sophisticated equilibrium where *a'* is a revelation on the Y dimension is not supportable because of the incentive to deviate and campaign on X. For example, suppose that *a'* = Y, and *a''* = X, and that both candidates are (+, +). The proposed equilibrium has both candidates choosing Y. However, suppose candidate ℓ defects and chooses X. This is not an off-path choice, so the sophisticated voter would assume that ℓ is (+, -) and that -ℓ is positive on Y but positive on X with only probability *p* (because if -ℓ were

realized themes *a'* and *a''*. So, for example, in the Sophisticated-X-Y strategy, candidates choose to reveal themselves as positive on X whenever possible, and try to reveal themselves as positive on Y whenever X is not available for a campaign. Table 5 shows how each of the four configurations of *a'* and *a''* translate into complete candidate strategies.

Table 5: Candidate Equilibrium Strategies with a Sophisticated Voter

Types		**Equilibrium Strategies (*a'*- *a''*)**			
Self	**Opponent**	**X - Y**	**oX - Y**	**X - oY**	**oX – oY**
(+, +)	(+, +)	X	Y	X	Y
(+, +)	(+, -)	X	Y	X	oY
(+, +)	(-, +)	X	oX	X	oX
(+, +)	(-, -)	X	oX	X	oX
(+, -)	(+, +)	X	X	X	X
(+, -)	(+, -)	X	oY	X	oY
(+, -)	(-, +)	X	oX	X	oX
(+, -)	(-, -)	X	oX	X	oX
(-, +)	(+, +)	Y	Y	Y	Y
(-, +)	(+, -)	Y	Y	oY	oY
(-, +)	(-, +)	Y	oX	Y	oX
(-, +)	(-, -)	Y	oX	oY	oX
(-, -)	(+, +)	Ø	Ø	Ø	Ø
(-, -)	(+, -)	oY	oY	oY	oY
(-, -)	(-, +)	oX	oX	oX	oX
(-, -)	(-, -)	oY[51]	oX	oY	oX

Legend:

X	Reveal one's own positive X trait
Y	Reveal one's own positive Y trait
oX	Reveal the opponent's negative X trait
oY	Reveal the opponent's negative Y trait
Ø	No campaign

Notice that for these equilibria, the strategies are not dependent upon the underlying probabilities (i.e., the treatments of 30%, 50%, and 70%), though it is possible (as in the Chapter

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(+, +) or (-, +), he would in both cases choose Y; the likelihood of the positive case is the probability *p*). Therefore, this cannot be an equilibrium. Similarly if *a''* were oX, then whenever ℓ is (+,+) and -ℓ is (-, +), -ℓ would do better defecting to oX rather than choosing Y and settling for a tie election.

[51] As in all cases in which the top two choices (here, X and Y) are not picked by either candidate, both candidates' failure to reveal either *a'* or *a''* gives the voter perfect information about the two candidates' types.

2 result) that players coordinate on a different one of these four equilibria depending upon the prior probabilities of candidates having poor character traits and/or non-centrist ideologies. Also, notice that revelations other than *a'* and *a''* are infrequently chosen. For example, look at the column for the sophisticated-X-Y strategy (i.e., *a'* = X, *a''* = Y). In this equilibrium, oX should only be chosen by a candidate who is negative on both dimensions $(-,-)$. Here, voting against the candidate that utilizes negative campaigning is a weakly dominant strategy.

It is important to understand that, unlike in the naïve voter case, a candidate's first two campaign choices (*a'* and *a''*) cannot be on the same dimension. For example, suppose that *a'* is X, *a''* is oX, and both candidates are $(-,+)$. This would mean that both candidates are revealing oX. However, that the opponent is negative on the X dimension is already revealed by his failure to reveal X. So, if candidate ℓ reveals oX and candidate -ℓ reveals Y, then the voter knows that ℓ is $(-,+)$. But candidate -ℓ, revealing oX, could be either $(-,-)$ or $(-,+)$. Voting for ℓ is a dominant strategy for the voter, and thus it is better here for either candidate to defect to Y.

The predictions above assume that the voter is risk neutral, but can change depending upon the risk preference of the voters. The following hypothesis addresses this.

(H6) **Risk Aversion Hypothesis**: Voters are risk averse, and thus with a naïve voter, candidates use positive campaigning more often than indicated in Table 4. Furthermore, with a sophisticated voter, candidates use the sophisticated-X-Y strategy from Table 5.

I measured voter risk aversion with a coefficient q that transforms a given payoff P into $\frac{P^{1-q}}{1-q}$. Setting $q=0$ leaves P unchanged and thus is equivalent to risk neutrality, and setting $q=1$ results in a log utility function. In the naïve voter model, risk aversion increases the utility

that the voter derives from positive as compared to negative campaigning. For example, without risk aversion, in the 50% treatment, both positive and negative campaigning cause an equivalent net change of 40 in the voter's expected utility for one of the candidates. However, if the voter is at all risk averse, then after candidate ℓ chooses X, the voter's expected utility difference between candidates ℓ and -ℓ ($\frac{80^{1-q}}{1-q} + .5(\frac{20^{1-q}}{1-q}) - .5\frac{100^{1-q}}{1-q}$) will be greater than her expected utility difference after ℓ chooses oX ($.5\frac{100^{1-q}}{1-q} - .5(\frac{20^{1-q}}{1-q})$). For instance, while these two equations both equal 40 when $q = 0$, if $q = .01$, the benefit from positive campaigning (38.91) outweighs the benefit from negative campaigning (38.42).

The following shows an example of how risk aversion affects the equilibrium strategies in the naïve voter model. In the 70% treatment, negative and positive campaigning on the X dimension are equally effective if $\frac{80^{1-q}}{1-q} + .7(\frac{20^{1-q}}{1-q}) - .7\frac{100^{1-q}}{1-q} = .7\frac{100^{1-q}}{1-q} - .7(\frac{20^{1-q}}{1-q})$; this has the approximate solution of $q = 0.393$. Furthermore, in the 70% treatment, at approximately $q = 0.510$, a positive revelation on the Y dimension becomes as effective as a negative campaigning on the X dimension—even though the positive revelation on Y only guarantees the voter a sure payoff of 20.

However, the role of risk aversion in the sophisticated model is not as clear, for two main reasons. First, in most instances, the strategies of the candidates perfectly reveal the candidate types to sophisticated voters. Second, risk aversion already has an implicit presence if the players have coordinated on the sophisticated-X-Y equilibrium instead of the other three sophisticated equilibria.

Perhaps the strongest effect that can be accorded to risk aversion in the sophisticated model is the effect on player mistakes measured by the quantal response function. This is

because the risk aversion coefficient modifies the payoff structure, which changes the magnitude of the utility differences and thus the probability predictions of player mistakes.

Results

Candidate Behavior

The first three reported results are derived from testing the three comparative statics hypotheses (H1–H3). In the following analysis, I dropped the cases where candidates chose "defeatist" campaigns, defined as revelations of good information about the opponent or bad information about themselves. Thus, when I report that a candidate chose X, it means the candidate revealed that he is positive (and not negative) on the X dimension. The defeatist campaigns account for only 7% of campaigns. Nearly half of these (45%) were in the case $(-,-)$ vs. $(+,+)$, and 80% of all defeatist campaigns were chosen by $(-,-)$ candidates. Furthermore, candidates using defeatist campaigns won only 2.2% of the time.

RESULT 1. *For each pair of candidate types, candidates are more likely to choose a negative revelation as the probability of a positive trait draw increases.*

There are more negative revelations when voters have higher expected values that candidates are good; this confirms the Positivity Offset Hypothesis (H1). Figure 4 shows how the percentage of negativity varies by treatment. In the figure, the nine relevant cases (when the first candidate has at least one positive trait and faces an opponent with at least one negative trait) are

labeled with the candidate's type followed by the opponent's type. In every case, the amount of negativity in the 70% treatment is greater than in the 30% treatment.[52]

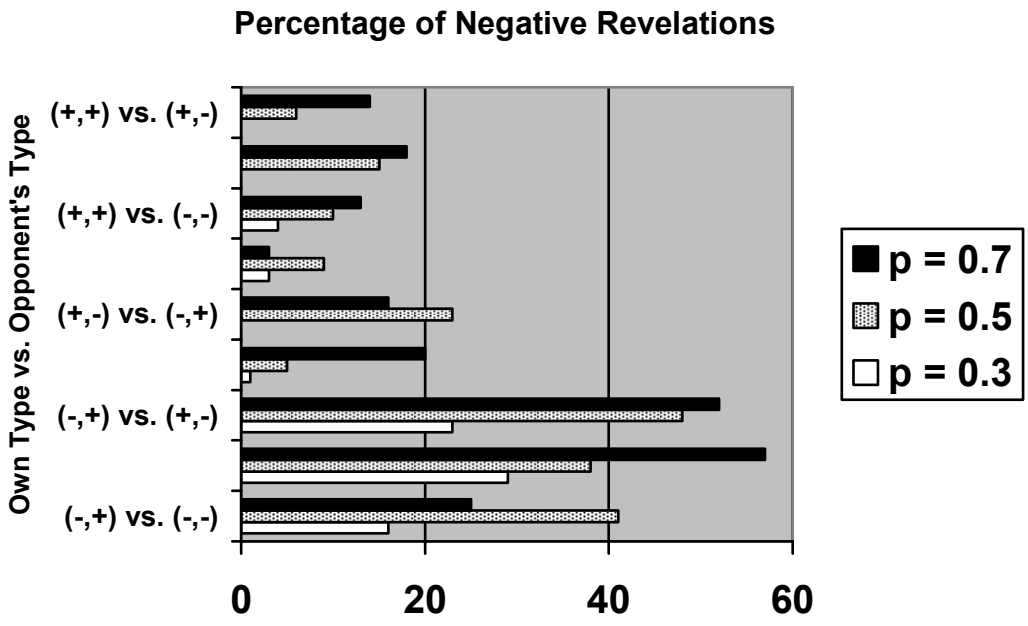

Figure 4: Incidence of Negativity by Case and Treatment

RESULT 2. *Overall, there are more negative revelations in the 30% treatment, and the fewest negative revelations in the 70% treatment.*

The overall percentage of negative revelations was 46% in the 0.3 treatment as compared to 31% in the 0.5 treatment $(t(1151) \geq 5.26, p = 0.000)$ and 14% in the 0.7 treatment $(t(1161) \geq 6.10, p = 0.000)$. All other things equal, there is more negative campaigning when

[52] This strategy shift was not a result of early mistakes by the players. I checked to confirm that candidates still behaved this way in the earlier rounds (1–30 and 1–15) versus latter rounds (31–60 and 46–60) of the experiment, and found no significant differences in behavior.

candidates are more likely to have negative traits, which corroborates the Poor Candidate Hypothesis (H2).

RESULT 3. *There are more negative revelations on dimension X than on dimension Y.*

The campaign choice oX was more than twice as common as oY (21% vs. 9%; $t(3568) \geq 9.92, p = 0.000$). This disparity was greatest in the 0.3 treatment (34% vs. 12%; $t(566) \geq 13.23, p = 0.000$) and smallest and not significant for the 0.7 treatment (8% vs. 6%; $t(178) \geq 1.12, p = 0.118$). The pooled results support the Dimension Preference Hypothesis (H3) that there is more negativity on the dimension where information has a greater effect on voter payoffs.

Result 1 not only demonstrates that candidates shifted strategies in accordance with treatment changes, it also rules out an important competing hypothesis about candidate behavior, because with sophisticated voting, this strategy shift need not have occurred. Recall that in Table 5, which lists the possible candidate equilibrium behavior under sophisticated voting, this behavior is not required to be treatment-dependent. But, while the candidates' behavior changed as the treatment changed, candidates did not appear to be shifting between sophisticated voting equilibria. The candidates' decisions to reveal oX rather than Y cannot be construed as a switch to the sophisticated oX-Y equilibrium in the 70% treatment because candidates still reveal X (rather than oX) whenever possible. For all treatments, the four possible sophisticated equilibria, the sophisticated-X-Y fits the data better than the other three sophisticated strategies. Table 6 lists the most commonly used campaign choices for each treatment and compares them to the naïve and sophisticated-X-Y strategies.[53,54] Columns in Table 6 have two entries whenever the

[53] More complete information about the chosen strategies can be found in Table 25 in the Appendix.
[54] Recall that in the case of (- ,-) vs. (-, -), any of the available strategies (oX, oY, or Ø) would work as an equilibrium because the candidates' failure to choose X or Y perfectly reveals the candidate types.

second-most-chosen campaign theme was picked more than 25% of the time and a t-test between the first- and second-most-chosen campaigns was not significant.

Table 6: Empirical Candidate Strategy Comparisons

Self	Opponent	Strategy (30%)	Strategy (50%)	Strategy (70%)	Naïve (30%)	Sophist. X-Y
(+, +)	(+, +)	X	X	X	X	X
(+, +)	(+, -)	X	X	X	X	X
(+, +)	(-, +)	X	X	X	X	X
(+, +)	(-, -)	X	X	X	X	X
(+, -)	(+, +)	X	X	X	X	X
(+, -)	(+, -)	X	X	X	X	X
(+, -)	(-, +)	X	X	X	X	X
(+, -)	(-, -)	X	X	X	X	X
(-, +)	(+, +)	Y	Y	Y	Y	Y
(-, +)	(+, -)	Y	Y, oY	Y, oY	Y	Y
(-, +)	(-, +)	Y	Y, oX	Y, oX	oX	Y
(-, +)	(-, -)	Y	Y, oX	Y	oX	Y
(-, -)	(+, +)	Ø	Ø	Ø	Ø	Ø
(-, -)	(+, -)	oY	oY	oY	oY	oY
(-, -)	(-, +)	oX	oX	oX	oX	oX
(-, -)	(-, -)	oX	oX	oX	oX	oX

Legend:

X	Reveal one's own positive X trait
Y	Reveal one's own positive Y trait
oX	Reveal the opponent's negative X trait
oY	Reveal the opponent's negative Y trait
Ø	No campaign

Candidate decision-making looks to have been influenced by voter behavior. This can be most readily seen by the increase in negative campaigning (oX) for the 50% and 70% treatments. Given the candidates' pattern of revealing themselves to be positive on X whenever possible, a sophisticated voter should avoid choosing negative campaigners. That candidates persisted in this approach could be because candidates were making mistakes, or that the negative strategy proved fruitful. The truth lies somewhere in between, as shown in the next section.

Voter Behavior

Table 7 reports voter behavior, showing the probability of voting for an arbitrary candidate ℓ if the opponent -ℓ has chosen a campaign different from that of ℓ.

Table 7: Voter Behavior

Candidate ℓ	Candidate -ℓ	Vote for Candidate ℓ (30% treatment)	Vote for Candidate ℓ (50% treatment)	Vote for Candidate ℓ (70% treatment)
X	Y	1.00	0.93	0.95
X	oY	1.00	0.95	0.93
Y	oX	0.84	0.80	0.45
oX	oY	0.64	1.00	0.89
Ø	Any other[55]	0.05	0.00	0.00

Notice the row in which voters face a decision between a candidate revealing a positive Y trait and a candidate negatively campaigning (oX). Since both candidates failed to reveal X, the voter should infer that neither candidate is positive on X. Even when performing no further analysis, the voter does best to choose the candidate known to be $(-,+)$ because the negative campaigner is no better than $(-,+)$ and possibly $(-,-)$. But, in the 70% treatment, the voters fail to infer this. More than half the time, they chose the negative campaigner.[56] So to combine these findings, as the prior probability of drawing positive traits increases, we find that the number of candidates choosing oX rather than Y increases and that voters become more likely to choose the candidate revealing oX over the candidate revealing Y. That voters are naïve and risk-averse is a better explanation for these behaviors than is sophisticated voting. However, both naïve and sophisticated voting adequately explain the following two voting results.

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[55] Both candidates chose to not campaign only once; this observation is excluded.

[56] Interestingly, voters in the latter rounds (31–60) were even more likely (80%) to choose the negative campaigner in the 70% treatment. Note also the timing of these oX versus Y decisions was not confined to the early rounds; over all treatments, 40% of all reported oX versus Y decisions were faced by voters in the last thirty rounds.

RESULT 4. *Candidates that chose positive campaigning on X won against candidates choosing any other campaign*.

This result is shown in the first row of Table 7. Candidates choosing X won at least 93% of the time against campaigns of Y, oY, or Ø.

RESULT 5. *Candidates who chose not to campaign lost almost every time.*

This can be verified in Table 7, which shows that candidates not campaigning lost 95% of the elections in the 30% treatment, and every election in the other two treatments. Candidates only chose not to campaign 4% of the time, and a majority of these (61%) were $(-,-)$ candidates facing a $(+,+)$ opponent.

RESULT 6. *Voters maximized their payoff in 84% of the elections with unequal candidates.*

In other words, in these elections, the better candidate won 84% of the time. Subject learning occurred in the very early rounds. The better candidate won 66% of the elections in the first five trials; this increased to 82% of elections in trials 6–10 and leveled off at 85% for the final fifty trials.

The better candidate failed to win most often in the case $(+,+)$ vs. $(+,-)$, being chosen in only 50% of elections. This of course was because both candidates were consistently choosing positive campaigning (X), which put the voter to a guess. The next worst for voter welfare was the case $(-,+)$ vs. $(-,\ -)$, which as mentioned earlier (see the explanation below Table 7) gave voters some difficulty. Here, the better candidate was still chosen 75% of the time. In the instances where the $(-,+)$ candidate failed to win, either the voter had been put to a guess (both candidates chose oX) or the voter mistakenly chose the candidate who had revealed oX rather

than the candidate who had revealed Y. In the case $(-,+)$ vs. $(-,\ -)$, welfare mistakes were least likely in the 0.3 treatment (18%) as compared to the other two treatments (36%); case $(+,+)$ vs. $(+,-)$ did not vary by treatment. Note that in both of the highlighted cases, the candidates were equal on the X dimension, so the voter's maximum utility gain for making a correct decision was only 20 points.

QRE Analysis

To test the hypotheses about voter sophistication and risk aversion, for the next phase of analysis I used the Quantal Response Equilibrium model (McKelvey and Palfrey 1995) as the underlying structure. QRE is a formal equilibrium model of imperfect play. Each player uses a quantal response function, which is a continuous best-response function that gives positive probability to choosing all possible actions; the function is monotonically increasing in expected payoffs. As a result, players in QRE do not always play their best responses, but do choose higher payoff responses more frequently than they choose lower payoff responses.

For this analysis, I used the logit QRE, chosen because it is a theoretical extension of the logit models commonly used to empirically estimate discrete choice in individual decision-making. In the logit QRE, all players' quantal response functions are logit functions of the expected utilities that are implied by the mixed strategies. Using logit quantal response functions yields the following voter strategy equation, where $\sigma_{a_\ell a_{-\ell}}$ is the probability of voting for candidate ℓ given the campaigns a_ℓ and $a_{-\ell}$ of candidates ℓ and -ℓ, respectively, and EU(ℓ) is the expected utility from voting for candidate ℓ.

$$\sigma_{a_\ell a_{-\ell}} = \frac{e^{\lambda EU(\ell)}}{e^{\lambda EU(\ell)} + e^{\lambda EU(-\ell)}} \tag{21}$$

$\sigma_{a_\ell a_{-\ell}}$ is a 5 x 5 matrix with one row and column for each of the five possible campaign choices, excluding defeatist campaigns (which were dropped from the dataset). λ is the parameter that measures the relative closeness to the Nash equilibrium. When λ = 0, voters will choose randomly between the candidates, voting for each 50% of the time regardless of the expected utilities. As $\lambda \to \infty$, strategies converge to the Nash equilibrium, which means that players choose the response with the highest expected utility 100% of the time. Note that λ measures only the relative closeness of the model to the Nash equilibrium. Because λ values are highly sensitive to the payoff structure, they only are meaningful in context, and thus we cannot determine the extent of player mistakes solely from the magnitude of any single λ value.

Labeling all sixteen possible type draws as cases 1–16 (as in Table 25 in the appendix), the voter's expected utility for voting candidate ℓ is defined as:

$$EU(\ell) = P(case1 \mid a_\ell a_{-\ell}) * 100 + P(case2 \mid a_\ell a_{-\ell}) * 100 + ... + P(case16 \mid a_\ell a_{-\ell}) * 0 . \qquad (22)$$

The candidate strategy equations are dependent on the candidates' types θ_ℓ and $\theta_{-\ell}$, and are shown in the equation below, which assumes that candidate strategies are symmetric:

$$\rho^{a_i}_{\theta_\ell \theta_{-\ell}} = \frac{e^{\lambda EU(a_i)}}{\sum_{j=1}^{5} e^{\lambda EU(a_j)}} . \qquad (23)$$

$\rho^{a_i}_{\theta_\ell \theta_{-\ell}}$ is a 4 x 4x 5 matrix with elements constrained to equal zero for all defeatist campaigns. The candidates' expected utility for each campaign option is

$EU(a_i) = 100 * \sum_{j=1}^{5} \sigma_{a_i a_j} \rho_{\theta_{-\ell}\theta_\ell}^{a_j}$, where $\rho_{\theta_{-\ell}\theta_\ell}^{a_j}$ is, due to symmetry, candidate ℓ's probability of choosing campaign j when the types are reversed.

The parameters λ and q were estimated by using Matlab software to calculate a fixed point for the above QRE equations. Voter expected utility for each of the sixteen cases was assumed beforehand to follow either the naïve model or the sophisticated belief that candidates were using the X-Y strategy shown in Table 5. Thus for the sophisticated voter, as λ increases, the estimates converge to the Sophisticated-X-Y equilibrium rather than a different one of the multiple potential equilibria. With this paradigm, the best-fitting values of λ and q were calculated for the empirical data via Maximum Likelihood Estimation. The results are shown in Table 8.

Table 8: QRE Maximum Likelihood Results

Model	Log Likelihood	λ	q
Naïve	-1607	0.07	0.00
Sophisticated-X-Y	-1445	0.06	0.00
Naïve with risk aversion	-1255	0.17	0.55
Sophisticated-X-Y with risk aversion	-1415	0.07	0.20

RESULT 7. *Voters are risk averse and naïve.*

Result 7, which verifies the Risk Aversion Hypothesis and the Naïve Voting Hypothesis, is evident from Table 8. First of all, it should be noted that if we require risk neutrality ($q = 0$), the naïve model does not fare as well as the sophisticated. However, Table 8 also shows that the QRE for the naïve voting model, with a risk aversion coefficient of $q = .55$, provides the best fit with the data. Furthermore the predicted q value is very close to the theoretical point ($q = .51$) at which naïve voters, in the 70% treatment, would be evenly split between candidates choosing Y

over candidates choosing oX. Recall from Table 7 that voters slightly preferred Y to oX in the 70% treatment, which is what $q = .55$ predicts. As expected, risk aversion does not have as strong of an effect with the sophisticated model as with the naïve, though the inclusion of risk aversion ($q = .20$), does provide a slightly better fit to the sophisticated-X-Y model.

Cursed Equilibrium

RESULT 8. *The best explanation for the experimental results involves a combination of naïve and sophisticated voting along with the inclusion of voter risk aversion.*

It is reasonable to assume that voters are not completely naïve, but instead have decision-making methods that lie somewhere on the continuum between perfectly naïve and perfectly sophisticated voting. To test this, I applied the concept of cursed equilibrium (CE: Eyster and Rabin (2005)) to this model. In a cursed equilibrium, voters are assumed to have some probability of ignoring the correlation between the candidates' actions and their underlying types. Specifically, the candidates assume that with probability χ, voters think candidates' decisions *are not* based on their types, and with probability 1- χ, that candidates' decisions *are* based upon their types. Accordingly $\chi = 1$ corresponds with the naïve voter equilibrium, while $\chi = 0$ corresponds with the sophisticated voter equilibrium. However, because CE makes a point prediction for each value of χ and thus presents a zero-likelihood problem, I avoid this by combining CE and QRE to obtain simultaneous parameter estimates. Table 9 shows the results from this estimation.

Table 9: Cursed Equilibrium Maximum Likelihood Results

Model	Log Likelihood	Λ	q	χ
Sophisticated-X-Y	-1415	0.07	0.20	0.00
Naïve	-1255	0.17	0.55	1.00
Cursed	-1116	0.13	0.35	0.73

The best fit is $\chi = 0.73$, which weights the naïve model more strongly than the sophisticated. This verifies that the data are best explained by using a combination of CE and QRE along with risk-averse voters.[57] In the appendix, Figure 17–Figure 19 show the QRE point probability estimates for campaign strategies at the predicted χ, λ, and q values, and Table 24 shows the theoretical QRE probability estimates of voting for each candidate.

General Discussion

This study analyzed political candidates' decisions to use negative campaigning by focusing on how differences between candidates and differences in voter decision-making criteria affect both the frequency and emphasis of negative campaigns. I found that candidates with negative traits were clearly more susceptible to negative campaigning, but due to voter preferences for positive information in this experiment, negative campaigning did not often lead to a successful election outcome for the candidate going negative. However, the voters' lack of sophisticated decision-making actually encouraged more negative campaigning—as the probability of candidates having positive traits increased, voters were judged by candidates as more likely to respond to negativity due to its departure from prior expectations.

Since the perception of voter naïvety resulted in candidates adopting strategies to account for the level of voter decision-making ability, a useful extension would be a test of how adaptable candidates can be to unannounced changes in voter preferences, prior beliefs, and decision-making criteria. It is certainly plausible to think that in current politics, candidates sometimes choose campaign themes based upon how successful those themes were in previous elections, and if so, further experiments could determine how quickly, and under what circumstances,

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[57] Other studies have also found χ weighted toward naïve behavior. Eyster and Rabin (2005), in fitting the cursed model to pre-existing experimental datasets, found generally that the best-fitting χ values were above 0.5, thus conferring a stronger weight upon the naïve decision-maker model. Carillo and Palfrey (2007), in various treatments of a compromise game, found χ values ranging from 0.75 to 0.97, with a pooled average of 0.85.

candidates are best able to change their styles to cater to a dynamic electorate. One possible method of testing this is replacing the voters with a decision-making algorithm (playing the role of a sophisticated voter, for example). Another is keeping candidates and voter pools separate; political candidates' votes clearly do not have as much influence over election outcomes as they did in the experiment, so this alteration could help capture that dynamic.

Overall, the experimental results presented here can help explain why we see political campaigns that can diverge so sharply in content. We should expect campaign themes to differ because candidates are playing to their strengths and their opponent's vulnerabilities, all the while accounting for the voters' prior expectations, preferences, and analytic ability. Of particular importance to the study of negative campaigning is that this model has shown the factors by which a candidate decides whether to attack the opponent. This should help supplant the idea that any candidate could improve the election outcome by simply "going negative". Instead, future studies should seek to further understand how the target of the negative attack and the voters themselves play a role—directly or indirectly—in determining which, if any, particular attack message would have improved candidates' electoral fate.

Chapter 5

Do Voters Truly Dislike Negative Campaigning?

As the title suggests, the aim of this chapter is to identify how voters respond to negativity in campaigns. These results are useful both for testing the formal theory and for broadening the scope of the study to incorporate the fact that a voter population is not just characterized by the median voter but instead is more demographically and ideologically diverse. Here, I use survey methodology to determine what types of voters are more amenable to negative campaigns, and which negative themes they find more acceptable.

This expository chapter serves also to connect empirical testing of the formal theory's implications (Chapter 4) with upcoming empirical testing of how negative campaigning tactics affect vote decisions (Chapters 6–8). I show that, consistent with previous results, voters with a positivity offset toward candidates are more affected by negative information. I also introduce evidence showing other segments of the population that are more willing to embrace negative campaigning. The overall conclusion is that voters do not hate negative campaigning as much as previous surveys would suggest.

Many have written about public cynicism toward politics (e.g., Capella and Jamieson 1997, Dionne 1991), and voter disdain toward negativity seems apparent from answers to surveys such as the Project on Campaign Conduct survey, conducted by the Sorenson Institute during the 2000 elections.[58] 87% of respondents expressed concern about personal attacks in campaigns. However, this result is not very informative. One might expect very biased results from asking

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[58] Respondents were Virginia voters. Results from this survey are available from the University of Virginia's Center for Survey Research; a summary of these results has also been published at http://www.thisnation.com/question/031.html.

voters if they approve of "personal attacks", or of "negative campaigning". First of all, the negatively charged wording of these phrases makes agreement with them inherently unappealing—how many people are eager to agree that they approve of something termed "negative" or an "attack"? Second, it does not distinguish credible attacks from baseless attacks, or even relevant from irrelevant. It is certainly reasonable for respondents who have encountered a maliciously false advertisement to express concern about campaign discourse, but it does not follow from this that all negative campaigning is bad, nor that people are immediately turned off by it. If instead, respondents had been asked instead something like, "Should candidates be allowed to reveal truthful information about an opponent's record, issue positions, or character?" it is reasonable to assume that more people would be willing to agree.

One must be careful when interpreting survey results about the public's disdain of campaigning. The imputed connection between the answers to the questions asked and the effects of actual negative campaigning may not be valid, because the respondents may in fact have focused on phenomena other than negative campaigning when expressing their disdain. For example, in the aforementioned Virginia study, 59% of respondents believed that all or most candidates deliberately "twist the truth" in campaigns; 39% of respondents believed that all or most candidates deliberately lie during campaigns. This is potentially useful in gauging voters' opinions of candidates' trustworthiness, or alternatively the degree to which they process campaign information. However, these questions alone will tell us nothing directly about negative campaigning. Why should we assume that these respondents were equating lies with attacking an opponent? Perhaps they believed that many candidates fabricate autobiographical information when positively campaigning about their own character.

Even though negative campaigns can often provide useful information to the voters (Geer 2006), discussion of campaign conduct usually assumes that negativity is undesirable. As mentioned in Chapter 1, this can lead to candidates and campaign observers calling for an end to

negative campaigning. While the formal model showed that such a ban leads to ambiguous welfare results, one may question whether such a proscription is conceivable in practice. But, frustration about the negativity of recent elections led Mexico to adopt a campaigning reform that includes a ban on negative campaigning (Serra 2008). While a similar approach in the United States would undoubtedly run up against the First Amendment, limits on negativity have been suggested via other means. The non-profit California Clean Money Campaign argues that public financing of campaigns would have the added benefit of discouraging negative campaigning; presumably limits on attack advertising could be linked to the acceptance of such funds.[59] Alternatively, sometimes candidates are encouraged to sign voluntary pledges to refrain from negative campaigning, though Maisel et al. (2007) show that campaign conduct is not improved by signing a pledge, and that most political consultants consider such a ban ineffective and against the best interests of challengers looking to make a case against a better known incumbent. The American Association of Political Consultants' voluntary code of conduct does not prohibit negative campaigning but instead "false and misleading attacks" (Nelson et al. 2002), though a large majority of consultants for candidates in close elections are not members of the AAPC (Maisel et al. 2007). It is particularly hard to enforce candidate pledges when "independent" organizations are the ones launching the attacks (West 1993).

But, the voters themselves may be the best judges of whether attacks are appropriate. In fact, I used the Virginia survey as an example because it also showed evidence that voters can discriminate between attacks based upon their perceived relevance to political discourse. A majority of voters, given a yes/no choice, believed that a candidate's voting record, "talking one way and voting another", acceptance of campaign money from special interests, current

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[59] "Clean money" laws, by which candidates voluntarily accept public funding under the condition that they limit spending and limit private campaign contributions, have been passed in Arizona, Maine, Vermont, Massachusetts, New Mexico, and North Carolina. See http://www.caclean.org/problem/ for more information.

drug/alcohol abuse, and tax evasion were relevant topics. However, over 60% of respondents believed that a candidate's past drug abuse, past financial problems, lack of military service, and family members' actions were not relevant to campaigns. 45% of respondents believed that all or most candidates deliberately made unfair attacks on their opponents. Yet, voters are willing to make distinctions between these different types of negative campaigning. Most likely, all other things equal, candidates who reveal credible information about the opponent on the more relevant topics will have more electoral success.

While the Virginia survey results show that voters separate campaigns according to relevance and credibility, they also raise an important question: which voters are more amenable to negative campaigning, and how can candidates better take advantage of this? Whether particular voters view personal attacks as necessary for differentiation or as a mean-spirited last resort will certainly affect their response to the campaign. The positivity offset, discussed in the previous chapter, could theoretically work in two different ways. It is possible that, as in the formal model and laboratory experiment, people who have higher opinions of political candidates will be more amenable to negative information, since it is a deviation from their positive expectation. The alternative psychological explanation is that because of the dissonance between negative information and their underlying beliefs about politicians, optimistic voters will be turned off to negativity and not believe in its truth.

To determine voter reactions toward negative campaigning, I compiled a list of fourteen theoretical campaign discourse topics: voting record, hypocrisy ("talking one way and voting another way"), past conduct in office, unfulfilled campaign promises, accepting special interest money, not paying taxes, current drug abuse, past drug abuse, police record, felony convictions, past financial problems, infidelity, lack of military service, and actions of family members. All but one of these, voting record, has a valence component. Note that the aforementioned topics from the Virginia survey are a subset of these. As part of the 2006 Cooperative Congressional

Election Study (CCES) survey, I asked respondents, "is information provided by one candidate about his or her opponent relevant when it relates to" the topic. There were three possible responses: "very relevant", "somewhat relevant", or "not relevant". I also asked questions that were directly related to my formal theory results: whether candidates' character or ideology was more important to their voting decision, whether candidates lie during the course of campaigns, and whether candidates running for national office were generally trustworthy and/or competent. Finally, I asked respondents to state a preference regarding whether candidates should withhold negative information.

The CCES survey was administered during Fall 2006 via the internet.[60] In the weighted results, about 86% of the 1000 respondents said they voted in November 2006. I therefore drop nonvoters from the analysis.

Results

Voters in the 2006 CCES survey demonstrated the ability to distinguish between attacks relevant and not relevant to the campaign. These results are shown in Figure 5 below.

[60] More information about the CCES can be found at: http://web.mit.edu/polisci/portl/cces/index.html.

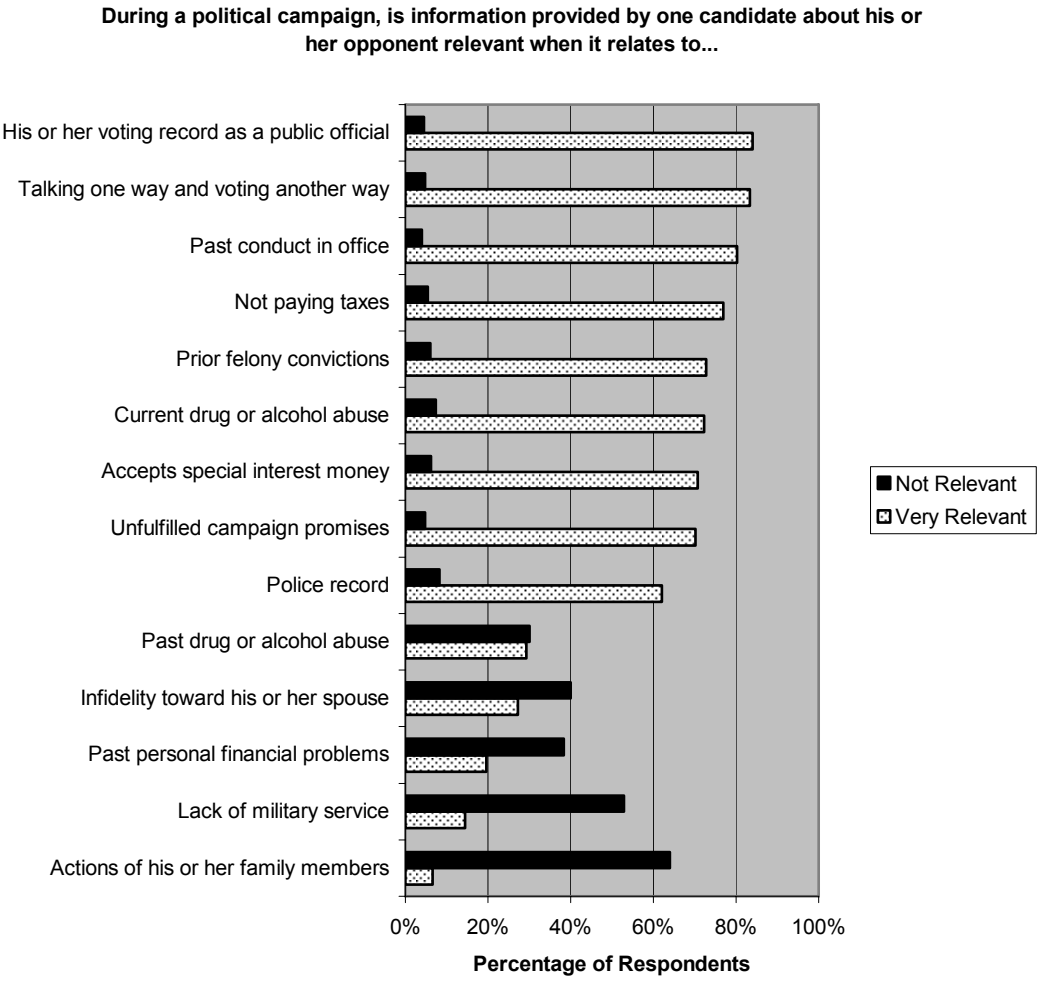

Figure 5: Relevance of Campaign Information About an Opponent

When asked the relevance of these fourteen hypothetical campaign revelations that a candidate could reveal about an opponent, voters considered the opponent's voting record to be the topic most appropriate for campaigns. 84% of respondents believed it acceptable for political discourse, underscoring why contrast ads are such a staple of political campaigns. All of the other topics focused more on personal conduct than political ideology. This negative biographical information was deemed important when it related to crime (e.g., felony convictions and not paying taxes) or behavior in the political sphere (e.g., past conduct in office and

hypocrisy). In contrast, a large majority (64%) viewed a candidate's family members as out of bounds, while only 7% considered it very important. Lack of military service, a criticism raised by opponents of both Bill Clinton and George W. Bush, also registered very low on the relevance scale.

Respondents were also asked their opinion of negative politics, but the question also included brief justifications for each point of view. It stated, "During a political campaign, is it better for candidates to never criticize their opponents because campaigns have gotten too negative, or do they need to criticize their opponents because it is important to know the strengths and weaknesses of all/both of the candidates?" Provided with a rationale for revealing negative information about an opponent, respondents were not overwhelmingly against negativity, but instead equally split between disdain of negativity (41%) and willingness to admit the introduction of more than just self-laudatory campaign material (41%).[61] As shown in Figure 6 below, members of the anti-criticism crowd were less receptive to negativity, but still were willing to separate relevant from irrelevant attacks. Topics denoted with asterisks (*) indicate that the difference in mean response between the two groups (pro- and anti-criticism) was significant to the $p < .05$ level.

[61] The remaining 18% responded "don't know".

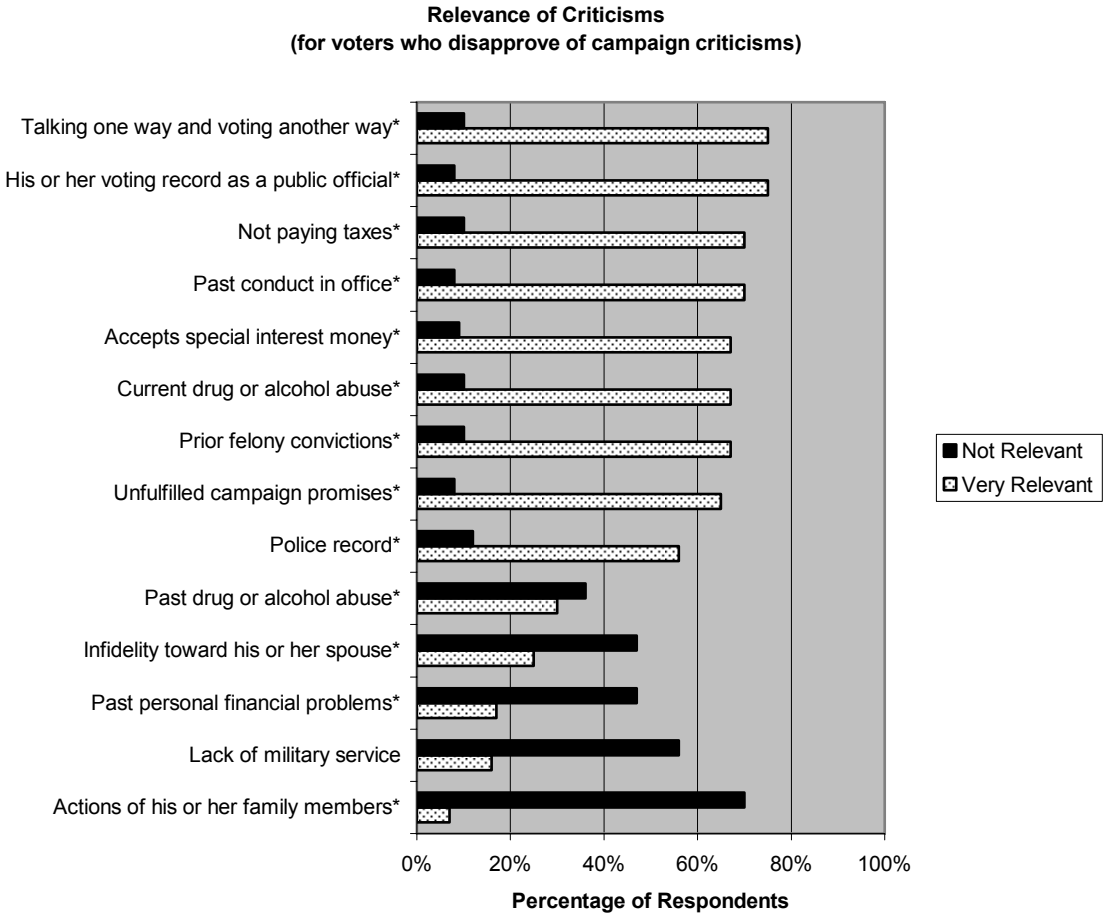

Figure 6: Responses by Voters Opposed to Criticizing Political Opponents

Notice that a large number of these voters, who believed candidates should never criticize their opponents, nevertheless acknowledged that such information is very relevant to campaigns even when "provided by one candidate about his or her opponent." Thirteen of the fourteen topics qualify as negative campaigning. This suggests that voters who claim to dislike attack politics nevertheless are influenced by the attacks and very willing to make individual exceptions if they deem the topic to be relevant. This supports the conjecture from the introduction to this chapter that most voters are not against negative campaigning when it involves true information

that they consider directly relevant to a candidate's potential performance in office. Instead, they are just disinclined to admit directly that they approve of candidates attacking each other. This reticence probably includes both discomfort with admitting support for conflict and dissatisfaction with false and/or irrelevant campaign attacks.

But, why are some voters interested in negative information about candidates? A key finding of both the formal theory (Chapter 2) and lab experiment (Chapter 4) is that voters with a positivity offset toward political candidates will be more interested in negative information due to its greater departure from their initial expectations. Are optimists really more willing to accept negativity than pessimists? To gauge this, CCES respondents, along with being asked their views on negativity, were asked two questions designed to reveal the extent of their positivity offset. Specifically these asked whether "most of the candidates for national elected offices (e.g., Congress, President)," were competent to hold that office, and whether they were trustworthy. As shown in Figure 7, a majority of voters chose positive options, though more perceived candidates as being generally competent than as generally trustworthy.[62]

[62] But, despite this modicum of faith in candidates' honesty, 54% believed that candidates are "very likely" to lie during the course of campaigns, and 69% responded that candidates are very likely to "twist the truth". Furthermore, another 30% believed that candidates were "somewhat likely" to lie, while only 5% chose either "somewhat unlikely" or "very unlikely". And, 30% believed candidates somewhat likely to twist the truth, leaving only 1% believing candidates unlikely to do this.

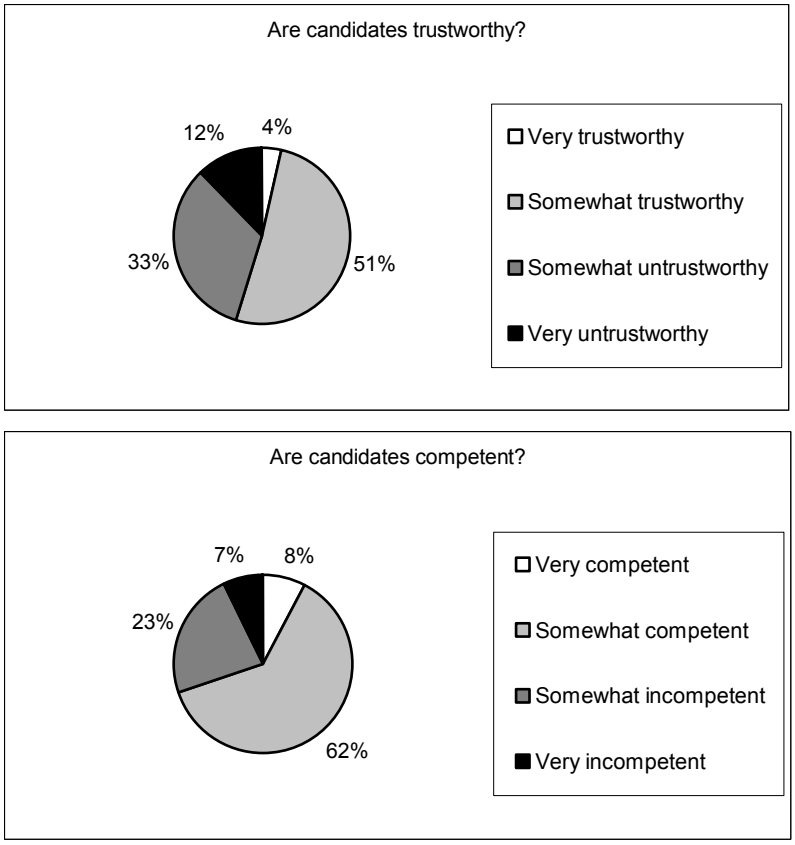

Figure 7: Voters' Initial Opinions About Candidates

Next, I cross-tabulated these responses with the voters' answers about the importance of criticism during campaigns. These are shown in Table 10.

Table 10: Voters' acceptance of campaign criticism depends upon their initial opinions about the candidates.

	Criticism is OK	Never criticize the opponent	Don't know
Competent	44%	39%	17%
Incompetent	36%	45%	19%
Trustworthy	45%	39%	16%
Untrustworthy	37%	43%	20%

These differences, which are statistically significant, support the notion that voters who think poorly of candidates are less interested in hearing negative revelations during campaigns. Voters rating candidates as very or somewhat competent were more likely to have answered that candidates should criticize the opponent than were voters who believed hypothetical politicians to be incompetent. Similarly, voters who viewed candidates as trustworthy were more likely to be in favor of negativity than those with who believed hypothetical politicians to be dishonest. One of the fourteen campaign topics, infidelity, provides a specific example of a candidate's prior untrustworthy behavior. It was deemed much more relevant by optimistic voters. Of those who believed candidates to be trustworthy, 34% believed that a candidate's infidelity was very relevant, while 32% considered it irrelevant. In comparison, only 19% of voters pessimistic about candidate honesty deemed infidelity very relevant, and 49% felt it was not relevant.

Voter opinion about negative campaigning was also affected by their preference between information about candidates' character and ideology. Respondents were asked whether the candidates' stances on political issues were more, less, or equally important than their character traits. 40% preferred policy information, 24% preferred character information, and 36% believed both to be equally important. Character voters tended to find more of the valence topics to be very relevant, as shown in Figure 8 below. Topics denoted with asterisks (*) indicate that the difference in response between character and issue voters was significant to the $p < .05$ level.

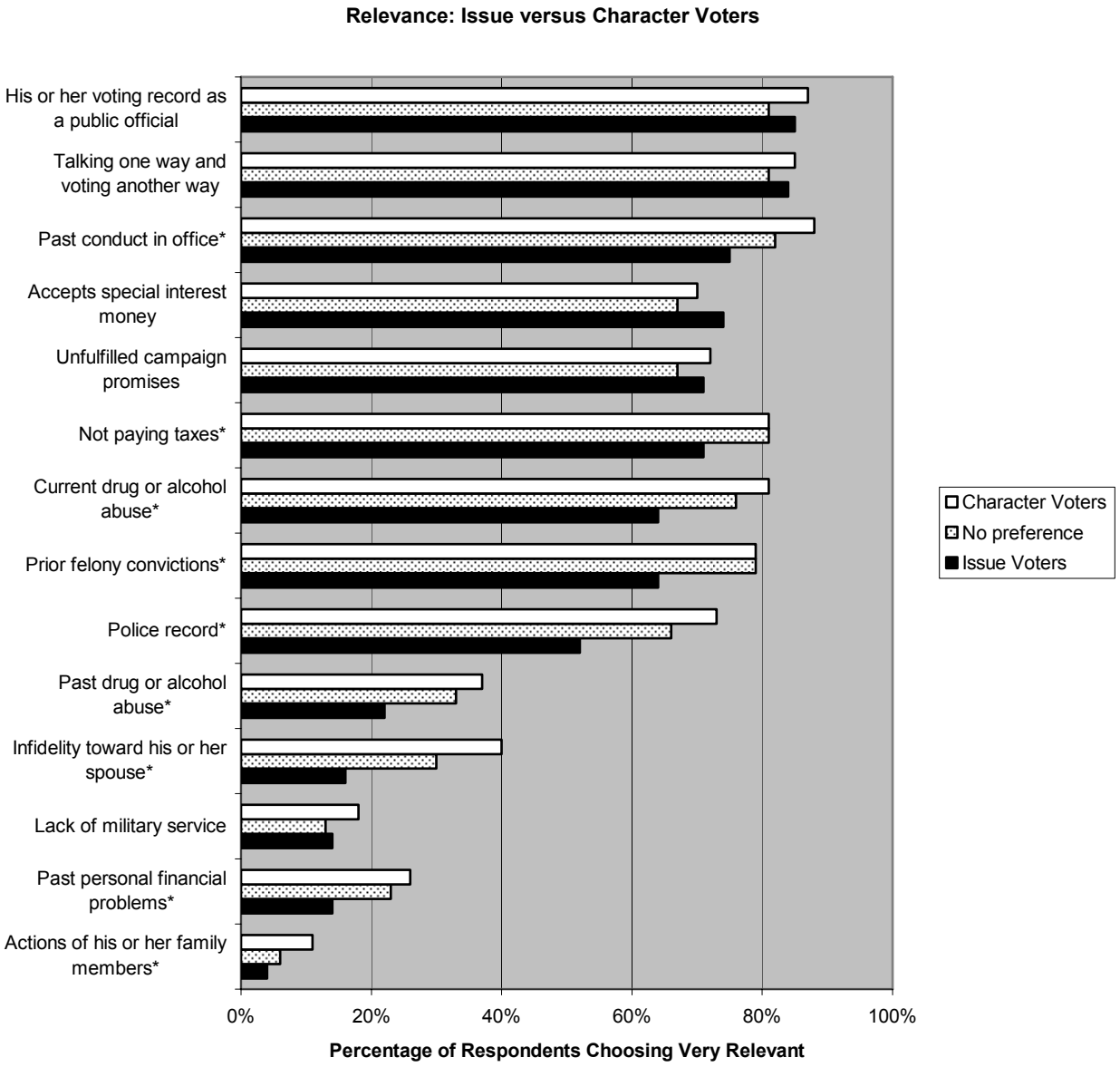

Figure 8: Importance of Campaign Topics to Issue and Character Voters

The only topic of the fourteen that was deemed more relevant by issue than character voters was the acceptance of special interest money, which could provide signals about both character (corruption or poor judgment) and ideology (acceptance of minority issue positions).

Other topics that could be construed in both political issue and personal character terms, such as "talking one way and voting another way" and "unfulfilled campaign promises", also were more equally relevant to both types of voters. Purely valence topics, such as drug abuse and felony convictions, created a larger spread between the two groups. The largest differential was for infidelity, which 40% of character voters deemed very relevant as compared to only 16% of issue voters.

By expanding the analysis to areas beyond the predictions of the formal model, we can learn even more about which voters prefer negative campaign rhetoric. For every voter, I created a summary variable indicating how many of the fourteen topics they believed were relevant.[63] I used this as a dependent variable in a regression in which the independent variables were various population segments. The regression results are reported in Table 11 below.

Table 11: Factors Affecting Voter Preference for Negativity (dependent variable: relevance aggregate)

Independent Variable	(1)	(2)	(3)
White	-0.05(0.02)*	-0.04(0.02)	-0.04(0.02)*
Female	-0.01(0.01)	-0.02(0.01)	-0.01(0.01)
Age	0.03(0.01)*	0.03(0.00)*	0.03(0.00)*
Education	0.00(0.01)	0.00(0.01)	0.00(0.01)
Income	0.00(0.00)	--	--
Party identification	0.01(0.00)*	--	0.01(0.00)*
Ideology	0.01(0.01)	--	0.01(0.01)
G.W. Bush disapproval	--	-0.02(0.01)*	--
Constant	0.55(0.05)*	0.69(0.04)*	0.55(0.05)*
N	626	745	758
R-squared	0.09	0.07	0.07

[63] Responses were first coded on a scale from 1 (not relevant) to 3 (very relevant), then aggregated across the fourteen topics, and finally scaled so the totals ranged from 0 to 1.

Standard errors are in parentheses, and coefficients are denoted with asterisks (*) to indicate significance to the $p < .05$ level. Negative coefficients represent less interest in negative topics. Negativity was more relevant to nonwhite, Republican, and older voters. Income did not affect voters' reactions to negativity so was excluded in columns (2) and (3) to increase the sample size. Column (2) shows that similar results are obtained using approval of George W. Bush's presidential performance as a proxy for both party identification and ideology.

Tables 26–28 in the appendix show regression results for each of the fourteen topics. There is a significant amount of variance which suggests that certain segments of the population will react differently depending upon the topic on which negative information is revealed. Even income, highly insignificant in general, separated voters in four instances (infidelity, voting record, police record, and felony convictions; see Table 28).

I also ran a regression using the answer to the general question about the appropriateness of negativity as the dependent variable.[64] This question required voters to directly oppose or support the idea of criticism.[65] Results are shown in Table 12 below.

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[64] As stated earlier, this question was worded, "During a political campaign, is it better for candidates to never criticize their opponents because campaigns have gotten too negative, or do they need to criticize their opponents because it is important to know the strengths and weaknesses of all/both of the candidates?"

[65] Here, the dependent variable was coded as 0 (never criticize), 1 (don't know), or 2 (ok to criticize). Ordered logit regression produced essentially identical results, so the linear regression results are reported due to the more easily interpretable coefficients.

Table 12: Factors Affecting Voter Preference for Negativity (dependent variable: never criticize?)

Independent Variable	(1)	(2)	(3)
White	0.13(0.11)	0.14(0.10)	0.14(0.10)
Female	-0.27(0.07)*	-0.27(0.06)*	-0.28(0.06)*
Age	0.01(0.03)	0.01(0.02)	0.01(0.02)
Education	0.09(0.03)*	0.10(0.02)*	0.09(0.03)*
Income	0.01(0.01)	--	--
Party identification	0.04(0.02)*	--	0.05(0.02)*
Ideology	-0.02(0.04)	--	-0.03(0.04)
G.W. Bush disapproval	--	-0.12(0.03)*	--
Constant	0.74(0.25)*	1.26(0.21)*	0.83(0.22)*
N	644	783	770
R-squared	0.06	0.07	0.06

The most noticeable difference between these and the topic-specific aggregate results in Table 11 is that women are much less likely to support the *idea* of political conflict, but no less likely to consider specific criticisms of an opponent to be important. Even with my carefully worded choice between negativity and information, there remains a difference between voters' reflexive anti-negativity response to a survey question and effect of negative campaigning on voter decision-making.

Voter Sophistication

These survey questions do not indicate how voters reacted in the voting booth when they deemed one candidate's attacks to be irrelevant. One possibility is that the voters ignored the attacks entirely. Another, which would bode worse for the attacker, is that voters made the sophisticated inference that irrelevant attacks imply the opponent must not have any major flaws (which otherwise would have been the subject of the attacks). As this is a form of Bayesian updating, the laboratory results from Chapter 4 suggest that few voters would make this inference. To test this, I asked the CCES respondents a difficult (and potentially confusing) question about inferences from negative campaigning. The question was, "If candidate A criticizes the character of his opponent (candidate B), it is most likely because:"

1. Candidate A has nothing good to say about himself/herself and nothing good to say about political issues.
2. Candidate A has nothing good to say about political issues, though Candidate A may have good things to say about himself/herself, but feels that the information about B is more important to the voters.
3. Candidate A may have good things to say about political issues and about himself/herself, but feels that the information about B is more important to the voters.
4. Candidate A may have good things to say about political issues and about himself/herself, but is talking about B instead, regardless of what the voters would want to hear.
5. Don't know

Choice 1 means that negative campaigning is a last resort from a candidate of poor character that holds unpopular issue positions. Choices 2 and 3 are more optimistic, suggesting instead that candidates intend for their negative campaigning to be in the voters' best interest. Choice 4 states that the negative campaigner has make a mistake, ignoring alternative campaign messages that would be of more interest to the voters. Voters choosing this option believe they cannot use the negative campaign to make inferences about the attacker's character or ideology. 20% of the voters selected the fifth choice, "don't know". So, while the question was difficult, 80% of voters were up to the task.

Voters' responses were consistent with their other views about criticizing opponents. Those against criticism tended strongly to favor strategy mistake (27%) and last resort (32%) interpretations, while those more comfortable with negativity chose these 14% and 17% of the time, respectively. The responses also varied significantly between character and issue voters. 33% of issue voters believed that the character attacks were a result of campaign strategy error, as compared to 16% of character voters. Character voters, however, were more likely to see a negative campaign as a last resort: 34% as compared to 24% of issue voters. Of course, the respondents were encouraged to make *some* kind of an inference. As evidenced by the dearth of sophisticated voting in the laboratory experiments of Chapter 4, voters may not perform such analysis at the polls.

Chapter 6

Don't Scare the Voters: Predicting Election Outcomes From Facial Judgments of Threat and Attractiveness[66]

The previous chapters have focused on identifying the conditions which make candidates more likely to engage in negative campaigning. In the following chapters, we change our focus from candidate *strategies* (whether to go negative) to candidate *tactics*. In other words, after the decision has been made to run a negative campaign, what is the best means of carrying that out? To whom should the campaign be targeted? And most importantly, how exactly does negative campaigning work? Chapters 6 and 7 address the latter of these questions. The mechanism for how negative campaigning enters the voters' decision calculus and ultimately affects vote choice has yet to be determined. In these two chapters, we focus on a major component of campaign tactics—the use of imagery—and lay the groundwork for further research designed to explain how negative campaigning via imagery affects voters. Here, we demonstrate the correlation between aspects of a candidate's image and election results, with the link between personal threat and losing elections particularly relevant to the question of how negative campaigning works. Then, Chapter 7 addresses the neurological foundations of this relationship.

While the manipulation of candidates' facial images has always been a key strategy for national political campaigns (Schlesinger et al. 1994), it has become ubiquitous now that modern technology has facilitated image manipulation and dissemination. Yet the actual effects of such

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[66] Co-authored with Michael Spezio, Scripps College; Hackjin Kim, Korea University; Alexander Todorov, Princeton University; Ralph Adolphs and Michael Alvarez, California Institute of Technology. This research was supported in part by funding from the Gordon and Betty Moore Foundation to R. Adolphs and R.M. Alvarez.

manipulations remain poorly understood. A growing line of research within political science has argued for the effects of a candidate's visual image on voter evaluation. Here scholars have looked at nonverbal means of candidate presentation, and have shown that a candidate's visual image can influence how potential voters evaluate a prospective candidate (Rosenberg et al. 1986; Rosenberg and McCafferty 1987; Rosenberg et al. 1991). The importance of a candidate's nonverbal image is of course not lost upon politicians, their advisors, and their consultants: for example, Nixon's "five-o'clock" shadow and refusal to use makeup in the 1960 debate with Kennedy is widely thought to have affected voter evaluations. More recently, the willingness of candidates to spend large sums of money on haircuts also signal the importance candidates place on their visual image.[67] The research from political science is consistent with other social and behavioral science research, which finds that rapid evaluations of faces influence social decisions (e.g., Blair, Judd, and Chapleau 2004; Hamermesh and Biddle 1994; Hassin and Trope 2000; Montepare and Zebrowitz 1998; Mueller and Mazur 1996; Zebrowitz et al. 1996).

An influential study (Todorov et al. 2005) tested the political impact of rapidly determined first impressions of facial images. They showed subjects paired pictures of unfamiliar Congressional political candidates, and found a small but highly significant positive correlation between the subjects' judgments of political competence and the actual election outcomes of races involving these same political candidates.[68] The Todorov et al. (2005) results tie together recent work studying individual evaluation of facial images with work in political behavior, and point to new directions for research designed to explain how factors like nonverbal images directly affect voter decisions in actual elections.

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[67] For a general discussion and history of presidential debates in the United States, see Jamieson and Birdsell (1990), and for a history of presidential advertising see Jamieson (1996). On the contemporary issue of candidates and their expensive haircuts, see coverage of Democratic presidential candidate John Edwards (http://www.msnbc.msn.com/id/18157456).

[68] A follow-up study by Ballew and Todorov (2007) finds the same for gubernatorial elections.

That subjects can make these personal assessments based on a rapid exposure to only a facial image of an individual is argued to derive from the same sorts of cues that help individuals in more general types of social encounters (Haxby et al. 2000). Modern social cognition "dual-process" theories assert that some decision processes are quick and involve little cognitive effort, while other decision processes are more deliberative and cognitively demanding (Chaiken and Trope 1999).[69] When individuals use only a facial image to make expeditious assessments about the traits of others, this conceptualizes the fast, intuitive portion of the dual-process decision-making model in which these rapid initial assessments can have lasting direct effects on decisions regarding the individual being evaluated (Todorov and Uleman 2003; Winston et al. 2002). It also seems clear that at least some social judgments based on faces can be made very rapidly and likely automatically. Willis and Todorov (2006) found in a non-political study that judgments made at 100 milliseconds correlated highly with judgments with no time constraints. Bar et al. (2006), also in a non-political study, found that people can discriminate between faces that appear threatening and faces that appear non-threatening after 38-millisecond exposure but not after 26 milliseconds. Yet, they also found that after 38 milliseconds, subjects did not discriminate faces when judging intelligence, which is a dimension similar to competence; however, Todorov and Pakrashi (2007) found that people can make meaningful judgments of competence after only 34 milliseconds.

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[69] There are many different dual process models; although they fundamentally agree that there are multiple systems for information processing, they disagree on the nature of and/or interaction between these processes. Our dual-process definition follows from Koriat and Levy-Sadot (1999). As with Cognitive-Experiental Self-Theory (Epstein and Pacini 1999), they separate processing into the experiential system (automatic, immediate, effortless processing) and the rational system (intentional, slow, effortful processing). Koriat and Levy-Sadot argue that both the analytic and non-analytic systems have a direct effect on decision-making, and that the weight an individual attaches to each process depends upon the details of the particular decision. Other research in social and political cognition has referred to similar bifurcated strategies, distinguishing between "theory-driven" and "data-driven" information processing (e.g., Fiske and Taylor 1991; Rahn 1993).

Here we take up two new questions: the possible effects on election outcomes of social judgments other than political competence, and the presentation and exposure time of the images on which those judgments are based. First, we expand upon the Todorov et al. (2005) work by introducing two negative assessments and clarifying the subjects' instructions so that each assessment pertains to either a political or personal decision. While many studies in recent decades have focused on negative campaign communications (e.g., Ansolabehere et al. 1994; Ansolabehere and Iyengar 1995a; Jamieson 1996; Mark 2006), much of the debate in the research literature has centered specifically on whether or not negative images suppress (e.g., Ansolabehere and Iyengar 1995) or boost (e.g., Goldstein and Freedman 2002) voter participation.[70] In contrast, we study the direct impact of negative assessments on voter decision-making.

Second, we allow for the precise experimental manipulation of the manner and timing of subject exposure to the candidate images by using the TED protocol (Kim et al. 2007), which shows the candidate pictures one at a time rather than contemporaneously, thus forcing an encoding of the face into working memory for the comparison. This protocol also allows subjects to see each picture multiple times before making an assessment.

We presented subjects with a subset of the candidate image pairs from Todorov et al. (2005) which were chosen to insure that the competing candidates were of the same gender and ethnicity, that the pictures were of similar resolution, and that the candidates were facing the camera. In four separate blocks, viewers were asked to choose the one face from each pair that they judged to more strongly exhibit each of four traits: attractiveness, competence, deceitfulness, and threat. The length of time each picture was shown was either thirty-three milliseconds or one second. As in Todorov et al. (2005), each of our image pairs consisted of candidates who ran

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[70] Additional studies of the link between negative campaigning and voter turnout include Freedman and Goldstein (1999), Kahn and Kenney (1999), Lau and Pomper (2001), and Wattenberg and Brians (1999).

against each other in actual Congressional elections. When we compared our subjects' chosen photographs in the laboratory to the actual election outcomes, we found that our subjects' assessments of competence, attractiveness, and threat were significant factors in predicting the real-world election winners.

Method

Subjects

Subjects were 43 paid graduate and undergraduate students at the California Institute of Technology, all tested in the Social Science Experimental Laboratory (http://www.ssel.caltech.edu/info) during January and February 2007. Twenty-one subjects were given 1-second exposure times, while 22 subjects were given 33-millisecond exposure times.

Stimuli

We used 30 image pairs of political candidates who ran against each other in actual House and Senate races in 2000, 2002, and 2004. These were a subset of the large set of pictures used in Todorov et al. (2005).[71] For consistency, we only used pairs of images with similar resolutions in which both candidates were facing the camera maximally head-on, and were of the same race and gender.[72] Images were cropped to 104 x 147 pixels, and were displayed for either

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[71] The Todorov et al. (2005) data show that our subset of 30 pairs had the same competence-to-winning correlation (59%) as that for the entire dataset. The elections involving our pairs were slightly more competitive than in the complete dataset; the winners' mean victory margin was by 27% of the vote, as compared to the overall average victory margin of 33%. 23 of the 30 winners (77%) were incumbents, and only 2 of the losers (7%) were incumbents. For comparison, note first that 25 of the 30 races were for 2002 House seats. In the Todorov et al. (2005) dataset, 84% of 2002 House races were won by an incumbent, while only 2% were lost by an incumbent.

[72] Both human and primate research suggest that neural representations in face-selective areas are viewpoint-dependent (Desimone, 1984; Lee 2006), which supports our use of a uniform viewpoint for our stimuli. For a literature review regarding the difficultly, behaviorally, of comparing a 3/4-view face with a frontal face, see also Burke (2007).

33-ms or 1-second durations on a 20-inch 16:9-aspect LCD monitor centered against a grey background inside a fixation rectangle with a black border of 15-pixel width.

Procedure

Subjects were first given instruction screens that explained the task and stressed the importance of taking sufficient time to make accurate decisions.[73] Every subject participated in four blocks, each asking the participant to make a specific judgment about the candidate pairs. Two of the judgments (deceitfulness and competence) were framed in a political context, while the other two (attractiveness and threat) were framed in a personal context. Specifically, the four questions were, "Your task is to decide which of the Candidates in each A-B pair appears [trait]," and the traits were:

1. "More COMPETENT TO HOLD CONGRESSIONAL OFFICE"
2. "More ATTRACTIVE TO YOU"
3. "More likely to LIE TO THE VOTERS"
4. "More likely to act in a PHYSICALLY THREATENING MANNER TO YOU"

These four assessment blocks were arranged in one of two orders—with attractiveness and competence first or second (counterbalanced), followed by deceitfulness third and threat fourth (fixed). On one trait at a time, subjects were asked to judge all thirty image pairs; the order of the thirty pairs and the order of the two pictures comprising each pair were randomized. As

[73] There were two screens of instruction. The first screen stated, "You will see several A-B picture pairs of Candidates A & B, where each picture is presented alone for a very brief time. Your task is to decide which candidate looks more like a given character trait. We will tell you which traits you should evaluate. You will see both Candidates A & B multiple times until you make a decision. Please wait to make a decision until you have seen both Candidates A and B at least once. You will have 60 seconds to make your decision. When you make a decision, that trial will end and will move to the next trial. Please take your time and be as accurate as possible in your decision." The second screen stated, "Hit the 1 key to choose Candidate A, or hit the 0 key to choose Candidate B. Please take your time and be very sure of your decision. Typically, people need to see a face around 2-3 times to be sure of their decision. If you can decide after seeing each face only once, then do so. But please be sure of your decision. Now relax, focus, and good luck!"

shown in Figure 9, each photo was accompanied by a circle to the left (if shown first) or right (if shown second) of the picture. The circle indicated the keyboard button ("1" for left and "0" for right) to be pressed in order to choose that picture.

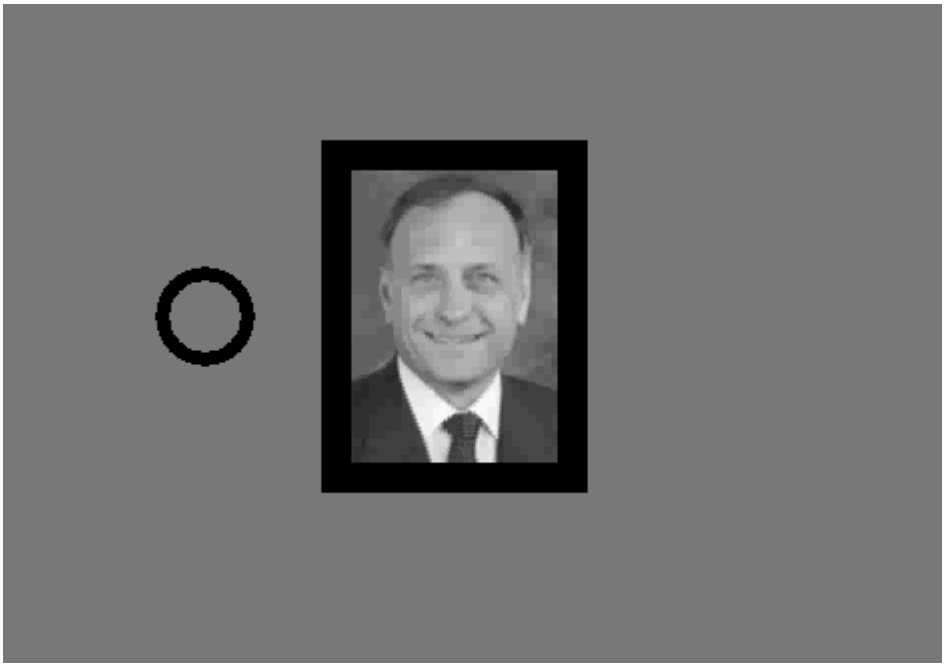

Figure 9: Sample Screen Shot

Subjects were shown each pair of pictures one at a time, repeating, with an inter-image interval of 2 ± 1 seconds; within each pair, the order that the two candidates were shown was counterbalanced among subjects. Image pairs continued repeating for up to 60 seconds until the subject chose a picture, and then moved on to the next image pair after 4 ± 1 seconds. This method effectively equates the stimulus judgments with respect to the confidence of the judgment for each subject. In both the 1-second and 33-ms trials, 99.8% of the subjects answered within

the allotted time limit, and the modal decision-making time was one cycle (i.e., viewing each candidate face once).[74]

As expected, some of the judgments were correlated (Table 13), although all correlations were less than 0.3, indicating that the four trait judgments we chose were relatively independent. As expected, competence and attractiveness, as well as deceit and threat, were positively correlated pairs of judgments. In general, correlations were somewhat stronger in the one-second treatment than the correlations in the 33-millisecond treatment, although both duration conditions produced very similar judgments. Across duration conditions, Cronbach's alpha (scale reliability) was 0.86 for attractiveness, 0.85 for threat and deceit, and 0.75 for competence.

[74] With the 33-ms exposure, subjects viewed each face an average of 1.6 times before making a decision (standard error = 0.02), as compared to 1.2 times with 1-second exposure (s.e. = 0.01).

Table 13: Pearson Correlations (p-values are Bonferroni corrected)

1-second Exposure				
	Competent	**Attractive**	**Deceit**	**Threat**
Attractive	0.27 (0.000)	1.00		
Deceit	-0.17 (0.000)	-0.23 (0.000)	1.00	
Threat	-0.22 (0.000)	-0.26 (0.000)	0.29 (0.000)	1.00
33-ms Exposure				
	Competent	**Attractive**	**Deceit**	**Threat**
Attractive	0.27 (0.000)	1.00		
Deceit	-0.17 (0.000)	-0.23 (0.000)	1.00	
Threat	-0.22 (0.000)	-0.26 (0.000)	0.29 (0.000)	1.00
Across Exposure Times[75]				
	Competent (33ms)	**Attractive (33ms)**	**Deceit (33ms)**	**Threat (33ms)**
Competent (1 sec)	0.5852 (0.019)	0.1144 (1.000)	-0.4221 (0.564)	-0.7086 (0.000)
Attractive (1 sec)	0.1354 (1.000)	0.7607 (0.000)	-0.2606 (1.000)	-0.3768 (1.000)
Deceit (1 sec)	0.1315 (1.000)	-0.0476 (1.000)	0.7641 (0.000)	0.3854 (0.992)
Threat (1 sec)	-0.0509 (1.000)	-0.0030 (1.000)	0.6484 (0.003)	0.7691 (0.000)

[75] The across exposure time correlations were determined by comparing, for each image pair, the percentage of subjects choosing that picture.

Results and Discussion

We investigated whether these judgments from faces made in the laboratory have any direct relationship to the corresponding Congressional elections in which the politicians in fact participated.[76] For each image pair, we conducted logit regressions with the election winner (one of the two images of the pair) coded as the dependent variable, and the face chosen on our task (for each subject, each image pair, and each of the four attributes that was judged) as each of four independent variables. We replicated the analysis also using ordinary least-squares regression on the percentage of votes received, which produced qualitatively similar results. As Table 14 shows, in the pooled dataset, competence, attractiveness, and threat were highly significant predictors of election outcomes.[77] We also ran logit regressions that included a dummy variable for the 33 ms treatment (chi-square (5 DF) = 60.30) as well as its interaction with the other variables (chi-square (8 DF) = 65.32). In both cases a chi-square test against the pooled model (chi-square (4 DF) = 63.21) rejected the treatment-specific model in favor of the pooled model, confirming that the quality of subject decisions was not affected by the relatively short exposure time in the 33 ms treatment. We therefore focus on the pooled data.

Effects of Individual Social Judgments on Election Outcomes

We estimated the change in the probability that a given image would be the election winner when a hypothetical subject switches her decision on a given judgment of that image

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[76] We combined our results as four dependent draws and tested to insure that the results overall were significantly different from chance. The Kendall's W-test coefficient of concordance was .17, which corroborates the hypothesis that the underlying means differ; the range of this test is from 0 to 1, with 0 indicating complete disagreement across questions and 1 indicating complete agreement. Finally, Cochran's Q-test for the pooled data returned a p-value of .0001, which indicates that we can reject the null hypothesis that these four dependent draws have the same mean.

[77] To test whether the effects of the other significant variables were distinct from that of competence, we also ran the same logit regression after orthogonalizing the four independent variables. This produced essentially identical results.

(holding the other judgments constant).[78] We found that attractiveness had the largest effect here, followed by competence and threat (Table 14). For example, switching in favor of choosing a picture in the attractiveness judgment makes that candidate 20% *less* likely to win, as compared to 15% *more* likely after a competence switch and 10% less likely after a threat switch.

Table 14: Logit Regression Predicting Election Outcomes[79]

	33-ms Treatment	First[80] Diff.	1-second Treatment	First Diff.	Pooled Data	First Diff.
Competent	.602 (.001)	.144 (.044)	.544 (.004)	.125 (.042)	.583 (.000)	.141 (.031)
Attractive	-.954 (.000)	-.217 (.043)	-.717 (.000)	-.161 (.047)	-.844 (.000)	-.196 (.031)
Deceit	.084 (.649)	.019 (.044)	.374 (.052)	.089 (.048)	.219 (.100)	.053 (.032)
Threat	-.312 (.091)	-.075 (.044)	-.521 (.008)	-.120 (.043)	-.423 (.002)	-.101 (.032)
Constant	-.599 (.002)		-.753 (.000)		-.671 (.000)	
N	655		625		1280	
Pseudo R^2	.0485		.0349		.0404	
χ^2 (4)	38.94		26.59		63.21	

[78] This is commonly known as a "first difference" estimate, and we use it here because the logit estimates reported in Table 4 are nonlinear and not easily interpreted. To produce a first difference estimate, we hold all of the right-hand-side variables to fixed values (which can be thought of as applying to a hypothetical subject) and compute the estimated probability that the particular image would be the election winner; we then change the value of one of the right-hand-side variables by a set amount, and recomputed the same probability. The difference between these probabilities is the first difference estimate, and we also are able to compute an estimate of statistical uncertainty for that estimate. For further discussion of the first difference methodology, see King et al. (2000) and Tomz et al. (2003).

[79] Numbers in parentheses are p-values for logit results, and standard errors for first difference results. Clustering standard errors for individual subject data yields nearly identical results.

[80] The modal subject choices were set so that picture 0 won the election approximately half of the time. So for example, in the pooled treatment, switching the competence choice from picture 0 to picture 1 changes picture 1's probability of winning: to 64.1% from 50%. Similarly, switching the attractiveness judgment from 0 to 1 changes 1's probability of winning: to 30.4% from 50%.

Table 15 makes election predictions in the thirty races by aggregating all of the subjects' choices for each social judgment. Here, the two strongest predictors are personal threat, which predicts 65% of election losers ($p = 0.049$) and personal attractiveness, which predicts 77% of election losers ($p = 0.003$). Interestingly, in the five open seat elections, the lack of an incumbent did not hurt the prediction rate. Threat correctly predicts four of the five losers, attractiveness predicts all five losers, and competence predicts three of the winners.

Table 15: Predicting Election Winners From Aggregate Subject Choices[81]

	33 ms Treatment	**1 second Treatment**	**Pooled Data**	**Races Predicted Correctly (from pooled data)**
Competent	50% (0.572)	60% (0.181)	57% (0.292)	57%
Attractive	35% (0.049)	28% (0.008)	23% (0.003)	77%
Deceit	53% (0.428)	45% (0.292)	48% (0.707)	52%
Threat	37% (0.100)	32% (0.21)	35% (0.049)	65%

However, because we used relatively few candidate pairs, for the remainder of the analysis we instead use the frequency in which each subject's choices matched the election outcomes (allowing N = 1240 observations for each judgment); this is provided in Table 16. Both the logit analysis (Table 14) and the percentage of correct predictions (Table 16) corroborate that the subjects' judgments of competence, threat, and attractiveness each have significant effects on election outcomes. We next explore each of these three significant effects individually in more detail.

[81] P-values from a one-sided binomial test (against a mean of 50% and N = 30) are shown in parentheses.

Table 16: Percentage of Subjects Choosing Election Winners[82]

	33 ms Treatment	1 second Treatment	Pooled Data
Competent	55% (0.031)	54% (0.010)	55% (0.001)
Attractive	42% (0.000)	47% (0.201)	44% (0.000)
Deceit	49% (0.755)	52% (0.379)	51% (0.716)
Threat	46% (0.035)	44% (0.002)	45% (0.000)

Our finding that competence judgments predict election outcomes (see again Table 14 and Table 16) replicates Todorov et al. (2005). We found that the individual competence judgments agreed with the election winner 55% of the time ($p < 0.001$, two-tailed binomial test against a mean of 50%), compared to 59% for the identical subset of stimuli taken from Todorov et al. (2005).

For threat judgments, by contrast, the face chosen as most threatening was the election loser in 55% of the individual trials (p-value of .000). Here, the personal nature of the fear question allows us to better interpret the results, because had we simply asked which of the candidates was more threatening, subjects could also have assessed a candidate as threatening for other reasons—because of the policies he would introduce if elected, for example. Instead, we asked subjects to gauge the risk of direct physical threat in order to elicit a rapid, automatic response of fear toward the images. And in fact, subjects' accuracy also depended on the duration of their decision making time. When subjects were able to judge threat before the second cycle (i.e., choose after seeing each face exactly one time) they picked the election loser as more

[82] P-values from a two-sided binomial test (against a mean of 50%) are shown in parentheses.

threatening 57% of the time. In comparison, slower threat decisions were no different from chance. After more than one cycle, only 49% of subjects chose the election loser. It is notable here that the images of politicians we used did not in fact exhibit any overt threat—they were all images of neutral or smiling people—yet even the forced judgment of threat in such otherwise friendly faces showed an association with election outcomes.

Attractiveness judgments yielded a most surprising result, in that they were negatively associated with election outcomes. Some previous work has shown that candidate "appearance" is strongly associated with election outcomes, with subjects being more likely to support candidates with "positive appearance" in mock elections (Rosenberg et al. 1986).[83] But in our study, the faces chosen as most attractive were actually far more likely to *lose* the election—56% of the chosen faces lost (p-value 0.000).

Interaction of Attractiveness with Competence and Threat

Attractiveness and competence judgments had a significantly positive correlation in our study (see Table 13), and in fact subjects chose the same face as both more competent and more attractive 60% of the time (57% under the 33 ms treatment and 64% under the 1 second treatment). Despite this correlation, competence and attractiveness yielded opposite predictions for election outcomes. This result arose due to a strong interaction between the two kinds of judgment: candidates judged to be both *more* attractive and *less* competent were very likely to have lost elections. Specifically, when a subject judged a face as more attractive but less competent than the opponent, that candidate won only 37% of the time (34% in the 33 ms treatment, and 40% in the 1 second treatment), an extraordinarily large effect. For faces chosen

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[83] Rosenberg et al. (1986) studied judgments of "appearance" and suggest that "appearance" is an aggregation of a number of other assessments, such as competence, integrity, and fitness for office. Thus, it is not clear that their results are about a candidate's attractiveness, as we have used the concept in this study.

as both more competent and more attractive, the results were more ambiguous, predicting election winners 49% of the time (47% at 33 ms, and 51% at 1 second).

We also have evidence that the duration of the exposure affects the attractiveness judgment. The predictive accuracy of the attractiveness judgments were significant for the 33 ms treatment, where the losers were chosen 59% of the time (p-value 0.000), but not at in the 1 second exposure time (53%, $p = 0.20$). But, within the 1 second treatment, the faster attractiveness judgments (one-cycle trials) correlated with election loss (55% after one-cycle trials, compared to 49% after multiple-cycle trials). Thus we suspect that in many of the quick attractiveness assessments (i.e., one-cycle decisions at 1 second and all decisions at 33 ms) subjects were judging something fundamentally different from what they were judging as attractiveness in the slower assessments.

What might explain the surprising association between attractiveness judgments and election outcomes? One possibility could be that, perhaps especially with shorter exposure times, attractiveness might be confused with threat, since both are driven by high emotional arousal. Indeed, the emotional arousal caused by threat has been shown to have an automatic and positive effect on perceived attractiveness, but only if the person is unaware of this connection (Foster et al. 1998). In line with this idea, it is interesting to note that Table 13 showed a negative correlation between attractiveness and threat for the 1 second treatment, but no significant correlation for the 33 ms treatment. Thus, those candidates who elicit fleeting judgments of attractiveness might also be those who elicit more permanent feelings of threat and aversion when it comes to elections.

A second possibility is that incompetence is augmented by attractiveness—at least by the rapid, fleeting attractiveness for which we found the largest effect. Rather than counteracting incompetence, the incongruency of attractive yet incompetent looking candidates may make them even less likely to be elected.

General Discussion

To our knowledge, this is the first study in which laboratory subjects' judgments about negative traits imputed from images of unfamiliar politicians who have run against each other for office are used to predict the actual election outcomes involving pairs of these same candidates. In fact, the aggregate results from the threat and attractiveness judgments could each be used to predict the winners of 65% and 77%, respectively, of the Congressional elections—though counter-intuitively, the *less* attractive faces of each pair were the winners. It is important to stress that even though the images were shown for short durations (33 ms or 1 sec), subjects produced judgments that correlated with which candidate wins the election; this we take as support for the idea that these assessments are quick and relatively effortless processes, as argued by Todorov et al. (2005).

Our work has broad implications for the study of political campaigns, especially negative campaigning, for which we offer an approach for gauging the importance of facial imagery that is different from that of recent literature. Even the relative perception of threat from faces that are not overtly threatening (but in fact smiling) is sufficient to bias election outcomes. And attempting to make a candidate look more attractive may well backfire if the candidate looks otherwise incompetent. What these findings suggest to us is that how we personally feel about a candidate may be as important as our objective judgment of political competence, and that voters are neither easily fooled by fleetingly attractive faces nor by smiles that hide threat.

Furthermore, we know that the subjects are responding to the risk of direct personal threat. Yet, the images were not provided in a negative context, but instead were devoid of any threatening (or disturbing) voice-over, text, music, or supporting imagery. Future work should focus on how (and if) campaigns can choose images to evoke the fear response, and also the extent to which negative manipulations of a candidate's image, along with other negative information and sensory input, can accentuate this perception of personal threat, and thus affect

not only electoral outcomes but also broader concerns like political participation and voter trust in government.

However, while our results provide intriguing support for the hypothesis that subjects are using rapid evaluation processes as the dual-process model predicts, we in fact we have much more to learn in general about the specific mechanisms through which these brief political and personal judgments are produced from simple facial cues and then carried forward to the process of voter decision making. We believe that using the new tools of social neuroscience will be especially effective in gaining a better understanding of how these evaluation processes underscore the nature of political decision making.[84] In the next chapter, we follow up on this suggestion by providing results from two neurological studies, one using the same candidate pictures and questions as in the study above; these suggest, via fMRI analysis, that the facial cues which caused subjects to pick up on personal threat are also used by voters in real elections.

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[84] For example, studies using lesion or functional imaging, focusing on the facial images of political candidates, and the same positive and negative evaluations, would help delineate the mechanisms by which political faces are evaluated and also help better understand the extent to which political decisions are reached through mechanisms that are similar to, or distinct from, the mechanisms by which individuals react to generic facial images (Adolphs et al. 1994, 2005; Adams et al. 2003). Furthermore, the TED protocol, which shows each candidate separately, is optimized for the analysis of fMRI results, as it enables the isolation of the subjects' response to each candidate throughout the course of each decision making process (Kim et al. 2007).

Chapter 7

A neural basis for the influence of candidate appearance on election outcomes[85]

We rapidly evaluate others based on their appearance, an effect that has been well demonstrated in social psychology (Hassin and Trope 2000; Todorov and Uleman 2003; Willis and Todorov 2006) and not lost on political scientists (Rosenberg 1986). In fact, recent behavioral studies have shown that judgments about candidates' facial appearance correlate with real election outcomes (Ballew and Todorov 2007; Todorov et al. 2005). Interestingly, participants made these judgments about politicians with whom they were unfamiliar, and after only very brief exposures to the images (100 ms). These findings are quite remarkable given the amount of information about candidates to which a typical voter is exposed. For example, in the 2006 U.S. midterm elections candidates and their interest groups spent over a billion dollars on advertising to inform voters of their party affiliation, record, policies, and personal qualities.[86] While some views in political science assume that such rich information is the primary driver of voter decisions (Popkin 1991; Prior 2005), there are other data suggesting that voters make use of much sparser information (Alvarez 1998; Downs 1957). Here we investigated the neural processes through which exposure to a candidate's face might affect voting decisions. We

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[85] Authored by Michael Spezio, Scripps College; Antonio Rangel, John P. O'Doherty, R. Michael Alvarez, and Kyle Mattes, California Institute of Technology; Alexander Todorov, Princeton University; Hackjin Kim, Korea University; Ralph Adolphs, California Institute of Technology. The authors wish to thank Jan Glaescher for helpful discussions. This research was financed in part by a grant from the Gordon and Betty Moore Foundation, and with support from the National Science Foundation (SES-0134618) (A.R.) and from the National Institutes of Health (R.A. & M.L.S.).

[86] CNN, "Record amount spent on campaign ads in 2006", http://www.cnn.com/POLITICS/blogs/politicalticker/2006/12/record-amount-spent-on-campaign-ads-in.html

performed two independent functional magnetic resonance imaging (fMRI) studies, each with a different task, set of stimuli, and participants.

In the first study participants made rapid social judgments based on the portraits of real, but unfamiliar, political candidates who ran against one another in the 2000, 2002, and 2004 U.S. Congressional elections. We used a subset of the same images used previously by Todorov et al. (2005). Participants made judgments about 30 pairs of candidates, one Republican and one Democrat (in randomized order), on two putatively positive traits, attractiveness (Attr) and competence (Comp), and two putatively negative traits, deceitfulness (Dect) and threat (Thrt), in four separate scanning sessions (Figure 20A). Each trial consisted of a protocol that has been previously used to investigate face preferences (Kim et al. 2007), in which the two images in a pair of candidates were presented sequentially, for only 30 ms each (unmasked), one alternating with the other, until the participant pushed a button to indicate which of the two faces showed more of the trait being judged.

As one would expect, judgments about the two positive traits were positively correlated (Attr&Comp, r = 0.39, $p = 0.002$), those about the two negative traits were positively correlated (Thrt&Dect, r = 0.61, $p < 0.0001$), and those between Comp & Thrt were negatively correlated (Comp&Thrt, r = -0.39, $p = 0.002$). No other statistically reliable relationships were seen in the behavioral data. With respect to real election outcomes, our behavioral data were in line with earlier findings by Todorov et al. (Ballew and Todorov 2007; Todorov et al. 2005): the association between winning an election and attractiveness judgments was not statistically different from chance (proportion agreement = 0.48 ± 0.1, $p > 0.1$), and the association between competence judgments and winning was weak but significant (0.54 ± 0.10, $p = 0.05$, one-tailed, uncorrected), although it did not survive correction for multiple comparisons. We also saw a weak association between election loss and deception judgments (0.53 ± 0.06, $p = 0.02$, one-tailed, uncorrected), although, again, this did not survive correction for multiple comparisons. A

novel behavioral finding was that the strongest association was between election loss and threat (0.57 ± 0.05, $p < 0.0001$, one-tailed, uncorrected), and this was the only correlation which survived multiple comparison correction. In addition, only the association between threat judgments and election loss survived in a multiple binomial regression model relating all four social judgments to the election outcomes (beta = 1.5, $p = 0.03$, $r2 = 0.1$, $p = 0.01$).

We analyzed the fMRI data from this first study by estimating a general linear model in which the appearance of a candidate's portrait was modulated, among other variables, by whether he had won or lost an election. We contrasted the parameter estimates obtained in response to the pictures of candidates who had won and those who had lost real elections. Given that threat judgments yielded the strongest behavioral association with electoral outcome, we hypothesized that the portraits of losing candidates should generate more activity in brain areas known to be associated with negative emotional processing, specifically the amygdala, the insula/parainsula, and the ventral anterior cingulate, on whose roles we comment further below.[87] Parameters were estimated separately for each of the four judgment blocks. We imposed a cluster-level extent threshold of $p < 0.05$ across all voxels in the amygdala, insula/parainsula, and anterior cingulate, together with a height threshold of $p < 0.005$. Using Monte Carlo simulations (Xiong et al. 1995) implemented in AlphaSim (part of the AFNI fMRI analysis package (Cox 1996)), we determined that significant clusters of activation were those with 10 or more contiguous voxels at $p < 0.005$ within any of the three regions of interest.

In the threat judgment condition, where we had found the most significant behavioral association with election loss, we found significant activation for the contrast "loser > winner" in the right insula/parainsula (Figure 21A; 18 voxels; [45,0,-15], $t = 4.80$) and right ventral anterior cingulated cortex (Figure 22A; 24 voxels; [15,39,0], $t = 4.02$; [9,45,6], $t = 3.90$), with additional

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[87] See the following: Adolphs et al. (1998); Salomons et al. (2007); Somerville et al. (2006); Williams et al. (2006); Coan et al. (2006); Lamm et al. (2007); Eisenberger et al. (2003); Eser et al. (2007).

foci in two other prefrontal regions. By contrast, we found only a single activation cluster for the contrast "winner > loser", located in the right supramarginal gyrus. With respect to the other social judgment conditions, despite the lack of a strong behavioral association, there were some brain regions that showed activations with electoral outcome (e.g., for Attr, with "winner > loser" in the caudate; for Comp, with "winner > loser" in the supramarginal gyrus and temporoparietal junction; for Dect, with "loser > winner" in the paracingulate cortex). Comp yielded no activations anywhere for electoral loss, and Dect yielded no activations anywhere for electoral victory.

The fact that only threat judgments correlated significantly with election outcomes argues that negative emotional processes, such as those driving the insula and anterior cingulate activations we found in the corresponding imaging analysis, might also be engaged during actual voting behavior. To test this directly, we carried out a second independent fMRI experiment in which participants voted in a simulated election. Participants were shown grayscale pictures of 100 pairs of real politicians, one Republican and one Democrat, who competed in the 2006 U.S. midterm elections (Figure 20B). The sample contained an approximately equal number of unfamiliar candidates running for the House, Senate, and governorships. Participants saw the image of each of the two candidates in sequence, separated by a blank screen, and after a delay were asked to cast their vote. All of the data were collected before the 2006 election, ensuring that participants could not have been influenced in any way by the real election outcomes.

We analyzed the fMRI data from this second study in two different ways. First, we performed an analysis using the voting data produced by the participants. We estimated a general linear model in which the appearance of a candidate's portrait was modulated, among other things, by its vote share on the hypothetical election, a variable that we refer to as lab-vote-share. We used the same procedures described above to identify significant clusters of activation. Consistent with the findings from study 1, lab-vote-share correlated negatively with activity in the

insula (this time the activation was bilateral and clusters were larger: 47 voxels; [-45,12,9], Z = 3.96; [48,-3,-9]; Z = 3.81; Figure 21B) and right anterior cingulated (23 voxels; [3,33,9], Z = 3.73; Figure 22B). We found no significant activations anywhere in the brain correlating positively with lab-vote-share.

We performed a second independent analysis in which the appearance of a candidate's portrait was modulated by the fraction of the vote that was obtained by each of the two candidates in the real election (the real-vote-share), essentially a parametric version of the electoral outcome regressors we had used in the first study. We found that activation in the right insula/parainsula correlated negatively with real-vote-share, although it did not quite reach our required threshold described above (Figure 2C; 8 voxels; [42,-6,-9], Z = 2.95, $p < 0.005$ uncorrected). The right ventral anterior cingulate was also activated, but also below our omnibus threshold for significance (Figure 3C; 5 voxels; [3,21,-6], Z=2.55, $p < 0.01$ uncorrected). While these findings regarding real vote outcomes are at a lower statistical significance than those used in the first study, they effectively replicate the results of the first study: activity in the insula/parainsula and anterior cingulate cortex is stronger when presenting images of candidates who lost real elections.

The patterns of activity in the insula and anterior cingulate show a striking similarity between the two studies, especially considering that they a) involved different groups of participants; b) used different images; and c) focused on different elections. Taken together, the studies suggest that rapid elicitation of negative emotional processes may mediate the connection between candidate appearance and voting behavior. This interpretation of the data is based on several observations. First, only threat judgments were robustly correlated behaviorally with election outcomes. Second, since the activations we report were found with very brief stimulus presentations (30 ms in experiment 1), they are likely to reflect rapid judgments based on features of a candidate's face, thus extending the rapid nature of face processing that has been reported elsewhere (Bar et al. 2006; Willis and Todorov 2006) to the processes that affect the decisions of

real voters. Third, both the insula/parainsula (Coan et al. 2006; Lamm et al. 2007) and the ventral anterior cingulate (Somerville et al. 2006; Williams et al. 2006) have been previously associated with the processing of negatively valenced emotions in social situations. The insula is an area known to mediate interoceptive processing and feelings (Craig 2002), such as sensations of pain or internal discomfort (Coan et al. 2006; Singer et al. 2004), and the right ventral anterior cingulate is implicated in panic attacks (Esar et al. 2007), fear (Williams et al. 2006, Bryant 2007), and uncontrollable pain (Salomons et al. 2007). These regions, including the parainsula (Stefanacci and Amaral 2002), are also known to connect strongly with the amygdala (Amaral et al. 1992), a structure known to play a key role in judging fear and threat from faces (Adolphs et al. 1998). It is surprising that we did not find any activation in the amygdala, although low statistical power may explain this negative finding.

The fact that neural activity exhibited a similar correlation with the real-vote-share and lab-vote-share variables suggests that the same facial cues that had an impact on participants in our study might also impact voters' decisions during real elections. The findings are all the more surprising given that nearly all of our politicians were smiling (100% in study 1; 92% in study 2) and none showed any overt negative facial expressions. Yet we found that decisions about how threatening they looked were significant predictors of actual election loss, and regional brain activation was found predominantly in structures known to process negatively valenced emotions. To our knowledge, this is the first demonstration that images with expressions that are overtly positive can nonetheless drive brain activations related to negative evaluations.

It is important to qualify the findings in several respects. First, although the weight of our findings suggests a preferential role for negative cue processing from candidate appearance, we did see some areas associated with positive emotional processing—notably activation in the caudate to the faces of election winners under the attractiveness judgment in experiment 1.

However, the behavioral judgments under these conditions (competence and attractiveness) were not as robustly correlated with real electoral outcomes. Thus, we do not wish to rule out that facial cues might also trigger positive emotions that contribute to voter decision-making, but this effect seems to be smaller compared to the effect of negative emotions. Second, it might be thought that the association between real election outcome and brain activation that we observed could itself be explained by the fact that both might correlate with the choices participants made in the task. However, we think this is implausible. In the first experiment, threat judgments and real election outcomes were both entered as orthogonalized regressors to predict brain activation; the activations associated with electoral loss that we report are therefore not merely derivative to a correlation with the threat judgments subjects made in the task. In the second experiment, we in fact did not find any behavioral correlation between real-vote-share and lab-vote-share whatsoever ($r = 0.003$, $p = 0.97$), making this idea implausible here as well. Instead, we favor the interpretation that common psychological processes—namely, the negative emotional evaluation reflected in the brain activations we found in both studies—link the perception of a candidate's face to its influence on voter choice.

A fundamental question in politics is the extent to which voters' decisions are driven by positive motives, which induce them to vote for candidates that they like, or by negative ones, which induce them not to vote for the candidate that they dislike. The pervasiveness of negative campaigning reflects a belief that negative motives play a role, if not an exclusive one, in voter's decisions (Fiorina and Shepsle 1989; Lau 1985). The results from our two studies suggest that political "intangibles", such as a candidate's appearance, might also work through negative motives. This raises a final question about the nature of those intangibles: what is it about a person's appearance that signals negative traits and influences election loss? Future studies with considerably larger stimulus sets, or with experimental manipulations of facial features, will be required to address this question.

Chapter 8

Fear and Voting in Presidential Elections[88]

This final chapter extends the findings of the behavioral and fMRI studies, which indicated that candidates who look threatening will begin a campaign with an electoral disadvantage. We corroborate that result here using survey data from the American National Election Study, which show a direct link between voter fear and voter decision-making. Since invoking fear of the opponent is a common tactic of negative campaigns, these results help us further establish a linkage between negative campaigning and election results.

Any observer of presidential elections in the United States knows that candidates try to evoke a variety of emotional reactions in their campaigns and communications. Candidates will surround themselves with positive and patriotic imagery while on the campaign trail. Such attempts to evoke positive emotional responses also exist in campaign advertising: one example is the "Morning in America" television advertisement, prominently featured in Ronald Reagan's 1984 reelection campaign, where the Reagan team attempted, by displaying a positive and upbeat set of patriotic images and audio, to persuade viewers that Reagan's first administration had turned things around in the country. But at least as prevalent are campaign communications that attempt to provoke fear and anxiety, primarily by displaying negative imagery, using frightening audio, and leading viewers (and/or listeners) to make extreme associations. Examples of presidential television advertisements that attempt to provoke fear and anxiety range from

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[88] Co-authored with R. Michael Alvarez, California Institute of Technology

Lyndon Johnson's "Daisy" advertisement in 1964 to the 2004 George Bush advertisement "Wolves".[89]

At the same time, there has been surprisingly scant academic research on the direct impact that negative television advertisements have on voter decision-making. There is research studying the relationship between negative advertisements and voter participation (e.g., Ansolabehere and Iyengar 1995a, Kahn and Kenney 1999; Niven 2006), as well as studies of negative campaign tactics (e.g., Mark 2006, West 2001) and whether negative attack strategies are informative (Geer 2006).[90] But how negative images, audio, and other associations that are made in negative attack advertising impact the emotional reactions of voters, how it directly influences their decision-making process, and how negative political communication operates cognitively and neurologically remain to be more thoroughly studied.

According to the "dual-process" theory explicated and supported in Chapter 6, some cognitive processes are fast and effortless, while others are slow and deliberate. It is argued that evaluations of others, including emotional and physical evaluations, are cognitive processes that are fast and effortless, but which can have lasting direct effects on other evaluations of the individual and on decisions regarding the individual being evaluated (Todorov et al. 2005; Todorov and Uleman 2003; Winston et al. 2002). Thus, as applied to the study of vote choice, emotional reactions to candidates ought to be fast and effortless; they ought to directly influence voter decisions about candidates, but they may also affect how voters evaluate candidates on other dimensions (like issues, ideology, and economic perceptions).

In this paper, we have two main goals in studying voters' fear of presidential candidates. First, we are interested in who is afraid of the candidates—whether certain groups of voters are

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[89] To view all of these candidate television advertisements, see "The Living Room Candidate: Presidential Campaign Commercials, 1952-2004", http://livingroomcandidate.movingimage.us/index.php.

[90] This is not an exhaustive review of the literature on negative campaigning, especially in the effects of negative campaigns on voter participation. A recent review of studies of negative campaigning is in Niven (2006).

more likely to be trepidacious. Second, we consider whether that fear, once evoked, has a direct impact on vote choice.

Voter affect in general has been previously studied in the context of campaigns and its influence on voter behavior, including campaign involvement (Rudolph et al. 2000) and voting decisions (Brader 2005). Abelson et al. (1985) compared affective reactions to cognitions as predictors of voter decision making, and Granberg and Brown (1989) found that affect and cognitions should be combined to attain more accurate vote predictions. Ragsdale (1991) showed how an emotional model could predict presidential approval more accurately than a non-emotional model. There have also been studies on how voters react to the candidates' emotional displays (McHugo et al. 1985; Masters et al. 1986) and specifically candidate anger (Tiedens 2001).

Affect has also been studied within the context of the rational choice model (Schwarz and Clore 1983) and specifically regarding vote choice (Ottati and Wyer 1993). Fear and anxiety have been studied in the context of campaigns and voter decision-making, using survey-based methodologies, perhaps most prominently by Marcus and MacKuen (1993, 2001) and more in Marcus, Neuman, and MacKuen (2000). In that line of research, those scholars argue that "anxiety", a composite of fear and anger, has profound effects on voter decision-making: the more anxious a voter becomes, the more likely she is to pay attention to campaign information and the less likely she is to rely on simple heuristic voting cues like partisanship.

At the same time, there has been surprisingly scant academic research focusing on which subset of voters would be most susceptible to the candidates' attempts in provoking fear, though studies of fear in other milieu provide a baseline for our expectations. Clemente and Kleiman (1977) studied the fear of crime in the United States across several demographical variables, and found that women and (to a lesser extent) the elderly tended to be the most afraid; race, income, and education were not considered to be important determinant of fear. Huddy et al. (2005)

obtained different results studying anxiety over terrorism, finding it was more likely for women, younger, and less educated voters; they also found Republicans to be less anxious than Democrats. In this paper, we study the characteristics of fearful voters, and show that while older voters and Republicans are less fearful, and gender effects are ambiguous, political attributes such as activism and interest are the most predictive of voter fear.

Since we are interested in how that fear influences voting behavior in presidential elections, we produce a series of tests for the direct and indirect effects of fear on voter decision-making, using data from the National Election Studies. In particular, we utilize a well-specified model of voter decision-making, including partisanship, spatial ideology, retrospective voting, and other social determinants of voting (e.g., Campbell et al. 1960, Downs 1957, Kiewiet 1983). To test for the direct effect of fear on voter decision-making, we then add measures of candidate fear to this model and find that fear does have an effect on voter choice in our analysis. We also conduct a series of tests that seek to assess the indirect role of candidate fear on voter decision-making, but in this part of our analysis we do not find that more fearful voters have substantially different decision-making processes than less fearful voters. Our paper concludes by discussing alternative approaches to the study of this important question, using new theories and methods from the social neurosciences.

Fear of Presidential Candidates

Data

Beginning in 1980, the American National Election Study asked questions designed to gauge voter affect toward the two major party presidential candidates. For each of four emotions (fear, anger, hope, pride), the respondent was asked if that candidate had done anything to elicit

that emotion.[91] We focus our attention on the emotional reaction of fear toward each of the two major party candidates, using this as the dependent variable in our analysis.

As with nearly all types of survey data on voting, there is undoubtedly a concern that the respondents' expressions of emotion are endogenous to vote choice (Ladd and Lenz 2008). In other words, after deciding for whom to vote, a respondent might then—based upon her candidate evaluation—be more likely to claim that the other candidate made her feel afraid (or angry). This argument is not limited, however, to emotion variables alone but could equally apply to responses including economic assessments, ideology, and specific issue positions. This problem of endogeneity is one that we return to throughout this paper. We also acknowledge that the conceptual direction of these affect questions is not immediately clear—whether the voter is afraid of the candidate (as we asked in Chapters 6 and 7) or instead of the policies he might implement is manifest from neither the wording of the questions nor the subjects' responses.

The Emotion Variables

While in this study we focus on the question of candidate fear, we feel it is also important to report the correlations among the affect variables in the ANES data. We undertook a principal components analysis of the four variables capturing emotional affect toward the two parties' candidates, and these results are reported in Table 17. It indicates a two-factor fit. The first factor separates the positive from the negative emotions, creating anger-fear and hope-pride pairings. The second factor underscores the importance of emotion in general. Here, all of the emotions have positive loadings. When fear of one specific candidate is regressed upon other important explanatory variables (e.g., demographics, candidate character evaluations, vote,

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[91] The questions were worded, "Now we would like to know something about the feelings you have toward [NAME]. Has [NAME]—because of the kind of person he is, or because of something he has done—made you feel [AFFECT]?"

ideology, party identification, and emotions) this emotionality factor remains significant.[92] All other things equal, fear of one candidate makes fear of the other candidate far more likely.

Table 17: Factor Analysis of Emotion Variables

	Factor 1	**Factor 2**	**Uniqueness**
Angry (Dem)	-0.59	0.61	0.28
Afraid (Dem)	-0.65	0.50	0.33
Hopeful (Dem)	0.78	0.39	0.24
Proud (Dem)	0.71	0.54	0.21
Variance Explained	47%	26%	
	Factor 1	**Factor 2**	**Uniqueness**
Angry (Rep)	-0.61	0.57	0.30
Afraid (Rep)	-0.62	0.55	0.31
Hopeful (Rep)	0.77	0.42	0.23
Proud (Rep)	0.73	0.50	0.21
Variance Explained	48%	26%	

As shown in Table 18 below, all correlations between the emotional variables are significant.[93] When we consider the correlations of emotional assessments for each party candidate, we see that the strongest positive correlations exist between hopeful and proud (.53 and .56), and to a lesser extent between anger and fear (.39), which shows that these are far from identical. For each candidate, the correlations between positive and negative emotional reactions are negative but relatively weak.

[92] The regressions reported in Table 30 through Table 35 (located in the Appendix) verify this.
[93] P-values, in parentheses, are reported after the Bonferroni adjustment, which takes into account that multiple pairwise tests have been performed on the same data. It requires more stringent acceptance criteria for significance by accordingly lowering the p-value needed to reject the null hypothesis of zero correlation.

Table 18: Correlations Between Affect Variables

	Angry (Dem)	Afraid (Dem)	Hopeful (Dem)	Proud (Dem)	Angry (Rep)	Afraid (Rep)	Hopeful (Rep)	Proud (Rep)
Angry (Dem)	-							
Afraid (Dem)	0.39 (0.00)	-						
Hopeful (Dem)	-0.22 (0.00)	-0.27 (0.00)	-					
Proud (Dem)	-0.14 (0.00)	-0.19 (0.00)	0.53 (0.00)	-				
Angry (Rep)	-0.07 (0.00)	-0.12 (0.00)	0.36 (0.00)	0.25 (0.00)	-			
Afraid (Rep)	-0.08 (0.00)	-0.04 (0.00)	0.33 (0.00)	0.23 (0.00)	0.39 (0.00)	-		
Hopeful (Rep)	0.33 (0.00)	0.33 (0.00)	-0.32 (0.00)	-0.21 (0.00)	-0.23 (0.00)	-0.23 (0.00)	-	
Proud (Rep)	0.28 (0.00)	0.31 (0.00)	-0.30 (0.00)	-0.14 (0.00)	-0.18 (0.00)	-0.20 (0.00)	0.56 (0.00)	-

While fear and anger load similarly and are positively correlated, psychological research indicates that the emotions differ, especially in their impact on risk. Anger promotes risk seeking behavior, while fear promotes risk-averse behavior (Lerner and Keltner 2000, 2001); thus, we believe that they could also have disparate effects on voting decisions and voter turnout. This and the results from Chapters 6 and 7 caused us to focus specifically on the fear of political candidates. The ANES data give us an opportunity to track the prevalence of fear across presidential elections.

Trends

Interestingly, fear appears to drive voters to the polls. When we look at aggregated survey responses from 1980–2004, we see that voters were more likely to express fear of a presidential candidate than were non-voters. This is shown below in Figure 10.

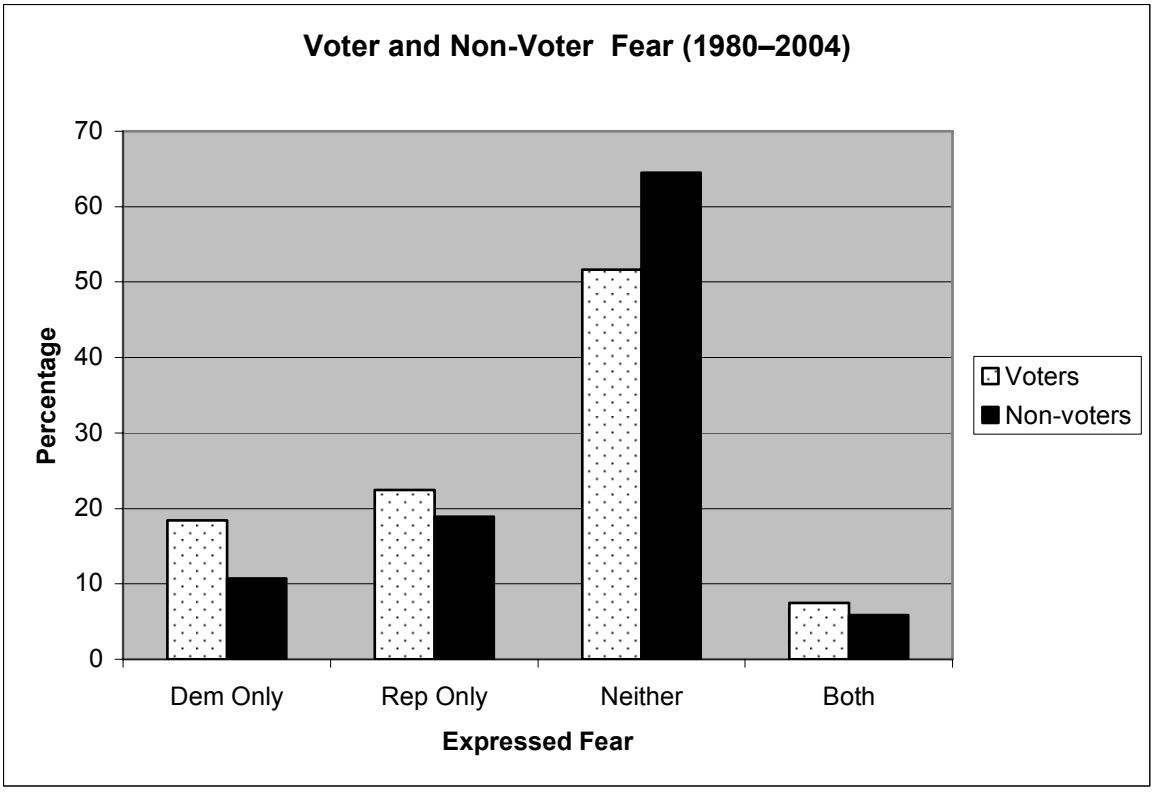

Figure 10: Voter and Non-Voter Fear

For each election, the voters have been separated into four distinct groups—those who were afraid of only the Democrat, only the Republican, both candidates, or neither candidate. After aggregating the presidential elections from 1980 through 2004, we find that voters, as compared to non-voters, were less often unafraid (52% to 64%), and were more often afraid of just the Democrat (19% to 11%), just the Republican (22% to 19%), or both candidates (7% to 6%).

Next, we take a brief look at the election of 2004. The conventional wisdom about the election is that fear was an important factor, and that the George W. Bush campaign played to voter fears by associating national security risk with the potential election of John Kerry. However, the ANES data demonstrate that voters in general were not heavily swayed by this

campaign tactic. While it is true that there was a greater incidence of voter-reported fear in 2004, it was Bush himself that evoked this response. This is evident in Figure 11, which shows the percentage of voters expressing fear of presidential candidates in 2004 as compared to the average from years 1984 through 2000.

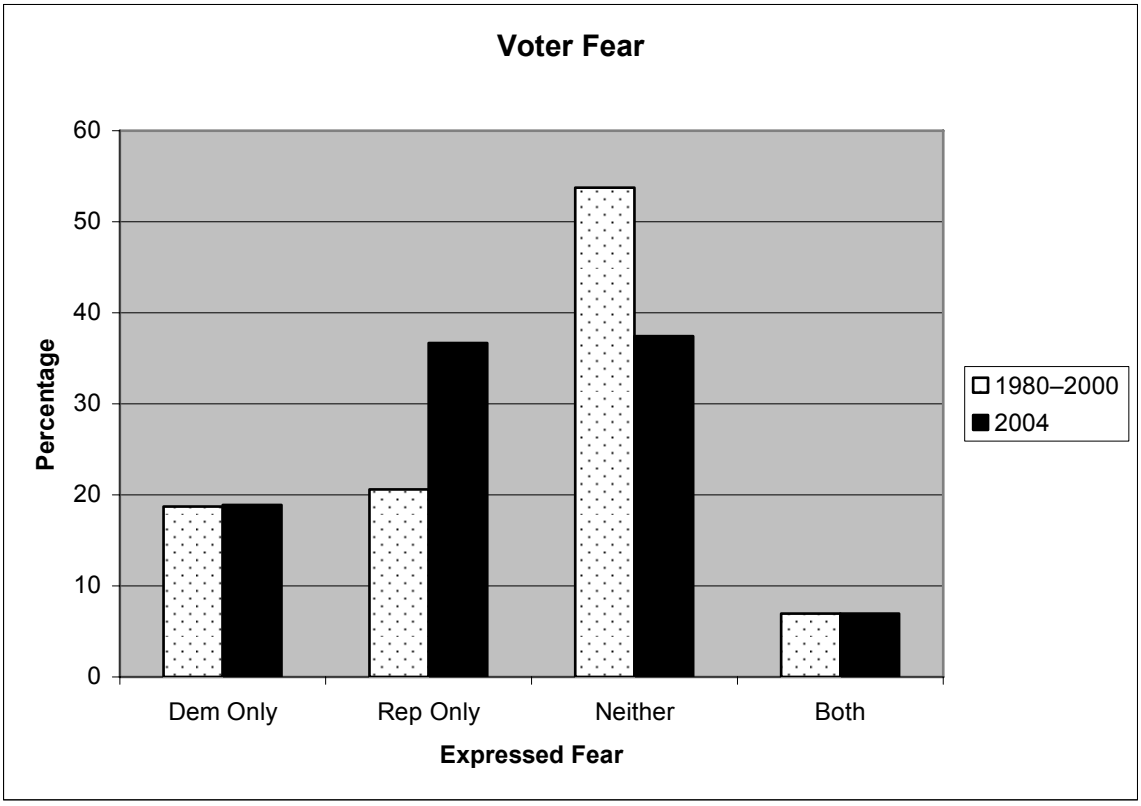

Figure 11: Voter Fear in 2004

Again the voters are separated into four distinct groups based upon their answers to the presidential candidate fear questions. For the presidential elections from 1980 through 2000, the above figure shows that 19% of voters expressed fear of the Republican candidate. But in 2004, we see that a much greater percentage of voters expressed fear of Bush only (37%). Yet, voters were no more afraid of John Kerry than of previous Democratic candidates.

Below, Figure 12 breaks out candidate fear by election year. It indicates that, of all the presidential elections surveyed, aggregate voter fear of the candidates peaked in 2004, where 63% of respondents were afraid of at least one candidate, and in 1992, where 58% were afraid. Both outstrip the average fear level of 49%, and basically all of the fear increase in 1992 and 2004 can be attributed to the abnormally high percentage of respondents afraid of candidates surnamed Bush. While it is the case that the incumbent president (Clinton in 1996, Bush in 1992, and Reagan in 1984) has consistently aroused more fear than his challenger, Bush's 2004 percentage among voters was nevertheless the highest of any other candidate on record. Only his father in 1992 reached a similar figure, but of course, unlike his son, he lost that election.[94] This suggests that fear is more than a simple proxy for vote choice.

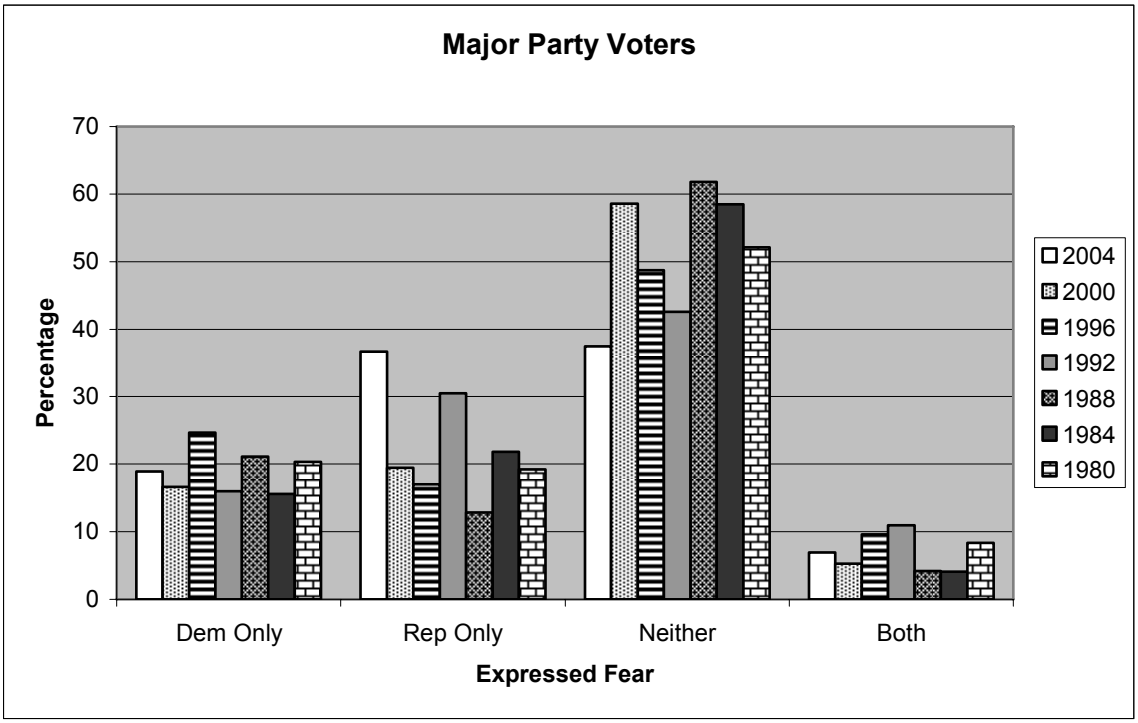

Figure 12: Voter Fear by Election Year

[94] 44% of the voters expressed fear of Bush in 2004, 37% of which were just afraid of him. In 1992, 40% were afraid of Bush while 29% were just afraid of him.

Who Is Afraid?

By using information about the voter, we can identify factors that make voters more likely to experience fear during the election cycle. But, concentrating on candidate-specific fear in a voting survey causes concern about endogeneity. As mentioned earlier, there is reason to suspect that vote choice and voter-reported emotion are highly correlated and have a recursive relationship. As Figure 13 shows, whenever a respondent expresses fear of exactly one candidate, the vote is easy to predict. 88% of voters who feared just the Democrat voted for the Republican; in the opposite condition the Democratic candidate received 82% of the vote.

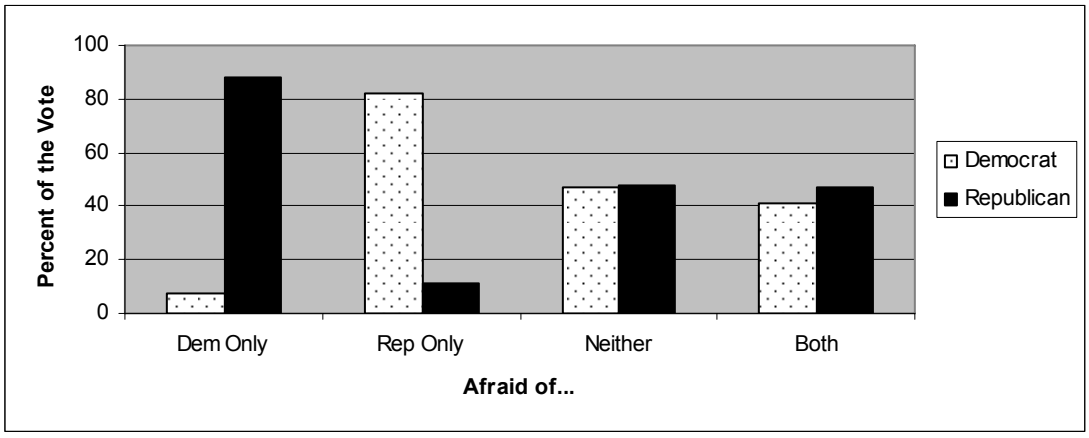

Figure 13: Fear and Presidential Vote

We cannot with certainty make any inference as to the direction of causation—it may be that fear influences the voting decision, the vote influences the expression of fear, or (most likely) it is a combination of both. However, in an average election year, 51% of respondents were not scared of either candidate, and 7% were afraid of both. Clearly, vote choice is not adequate to explain the reactions of these respondents.

To better focus on aspects of voters that are more likely to result in candidate fear, regardless of vote choice, we separated voters into two broader categories: the afraid and the

unafraid. Those who expressed fear of at least one candidate were placed in the former group. We used this dichotomous fear variable as the dependent variable for a probit regression. For independent variables, we utilized a well-specified model of voter decision-making, including partisanship, spatial ideology, retrospective voting, and other social determinants of voting (e.g., Campbell et al. 1960, Downs 1957, Kiewiet 1983). Whenever possible, choices and coding were based upon those used in both Marcus, Neuman, and MacKuen (2000) and Ladd and Lenz (2008).[95]

Table 19 shows the results of the regression. The first column reports the coefficients for all years of the study combined (1980–2004). Positive coefficients indicate that the group is more likely to express fear; negative coefficients show that they are less likely. Standard errors are in parentheses, and coefficients are denoted with asterisks (*) to indicate significance to the $p < .05$ level. To more easily interpret the coefficient estimates of the variables, first differences for an independent modal voter (about 50% likely to be afraid) are included in the same column as the overall regression.[96]

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[95] Coding of variables not represented in the aforementioned studies is done similarly to that of Alvarez and Nagler (1995). The details for our coding can be found in the appendix.

[96] First differences for the election year dummy variables were not calculated. Each of the simulations mentioned in the text was performed using the CLARIFY package (simqi command) in Stata 9 on the results from the previously reported logit estimations (Tomz, Wittenber,g and King 2001; King, Tomz, and Wittenberg 2000).

Table 19: Determinants of Voters' Fear

Independent Variable	All Years	First Differences	2004	1988
Male	-0.01(0.03)	-0.4%(1.3%)	-0.26(0.10)*	0.26(0.09)*
Education	0.10(0.02)*	3.8%(0.7%)*	0.10(0.06)	0.09(0.05)
Black	-0.13(0.06)*	-5.2%(2.2%)*	0.02(0.17)	-0.25(0.15)
Hispanic	-0.06(0.08)	-2.6%(3.0%)	0.12(0.23)	0.14(0.19)
Native American	0.08(0.10)	3.2%(4.2%)	0.11(0.27)	-0.12(0.26)
Asian	-0.14(0.14)	-5.4%(5.7%)	0.06(0.35)	0.22(0.49)
Age 17–34	0.04(0.04)	1.7%(1.6%)	0.08(0.13)	-0.11(0.10)
Age over 55	-0.12(0.04)*	-4.8%(1.6%)*	-0.16(0.11)	-0.30(0.10)*
Catholic	-0.15(0.04)*	-5.7%(1.6%)*	0.14(0.13)	-0.15(0.10)
Jewish	0.00(0.10)	0.0%(4.0%)	0.02(0.31)	0.10(0.30)
Church Attendance	0.00(0.01)	0.0%(0.1%)	0.03(0.04)	0.00(0.03)
West Region	0.01(0.05)	0.1%(1.9%)	0.24(0.14)	-0.04(0.12)
East Region	-0.01(0.05)	0.0%(1.9%)	0.19(0.15)	-0.08(0.13)
South Region	-0.02(0.04)	-0.1%(1.7%)	0.17(0.13)	0.00(0.11)
Democrat	-0.04(0.05)	-1.8%(1.8%)	0.00(0.14)	-0.16(0.12)
Republican	-0.15(0.05)*	-6.0%(1.8%)*	-0.33(0.14)*	-0.11(0.12)
Strong Party ID	0.10(0.04)*	4.2%(1.6%)*	0.12(0.12)	0.08(0.10)
Extreme Ideology	0.17(0.03)*	6.8%(1.4%)*	-0.08(0.11)	0.22(0.09)*
Political Interest	0.26(0.03)*	10.0%(1.0%)*	0.27(0.08)*	0.28(0.07)*
Activist	0.25(0.04)*	9.7%(1.7%)*	0.32(0.12)*	0.15(0.11)
Economic Assessment	0.08(0.02)*	3.1%(0.7%)*	0.10(0.05)	0.00(0.05)
Year: 1984	-0.05(0.07)	--	--	--
Year: 1988	-0.19(0.07)*	--	--	--
Year: 1992	0.19(0.06)*	--	--	--
Year: 1996	0.17(0.07)*	--	--	--
Year: 2000	-0.12(0.07)	--	--	--
Year: 2004	0.36(0.07)*	--	--	--
Constant	-1.17(0.13)*	--	-0.97(0.36)*	-1.14(0.30)*
N	6600		767	1004
Pseudo R-squared	0.06		0.08	0.06
Chi-squared	550.17*		76.07*	79.35*

Fear levels are mostly associated with the intensity of political attributes. Political activists and those of high political interest were most afraid, followed by those with an extreme ideology (either conservative or liberal). Voters with strong party identification were also afraid, though to a lesser extent than those with extreme ideologies. Opinion about the state of the economy, long considered an important aspect of retrospective voting, also registered a change in fear levels, and in the direction expected, so that more positive views of the economy made a voter less likely to report candidate fear.

Also, just as with anxiety in Huddy et al. (2005), we found that Democrats and independent voters were more susceptible to fear comparative to Republicans, and that elderly voters (unlike of crime) were less afraid of the candidates. Also more fearful were Protestants as compared to Catholics, and (unlike of terrorism) voters with higher education levels. This suggests that the success of candidates' attempts to evoke fear in the voting booth depends upon both the segment of the population that is targeted with these appeals and the specific topic of the campaign.

Changes in Fear Levels: 1988 and 2004

As first indicated in Figure 12, voter fear also varies across election years. Some candidates evoked voter fear much more so than others—perhaps due to the candidates themselves, the campaign strategies of their opponents, public sentiment in general, or some combination of these factors. In the previous regressions, these fluctuations were captured by the election year dummy variables (see Table 19). They showed that from a fear perspective, 1988 and 2004 were polar opposites. The election of 1988 is notable for having the lowest level of overall candidate fear; only 39% of voters expressed fear of a candidate as compared to the high of 63% in 2004.

Also, of all the elections studied, in 2004 fear was by far the most polarized. Only in 2004 was there a significant negative correlation (-0.20) between fear of one candidate and fear of the other party's candidate. There were also marked differences in the attitude of ideological extremists, as shown in Figure 14.

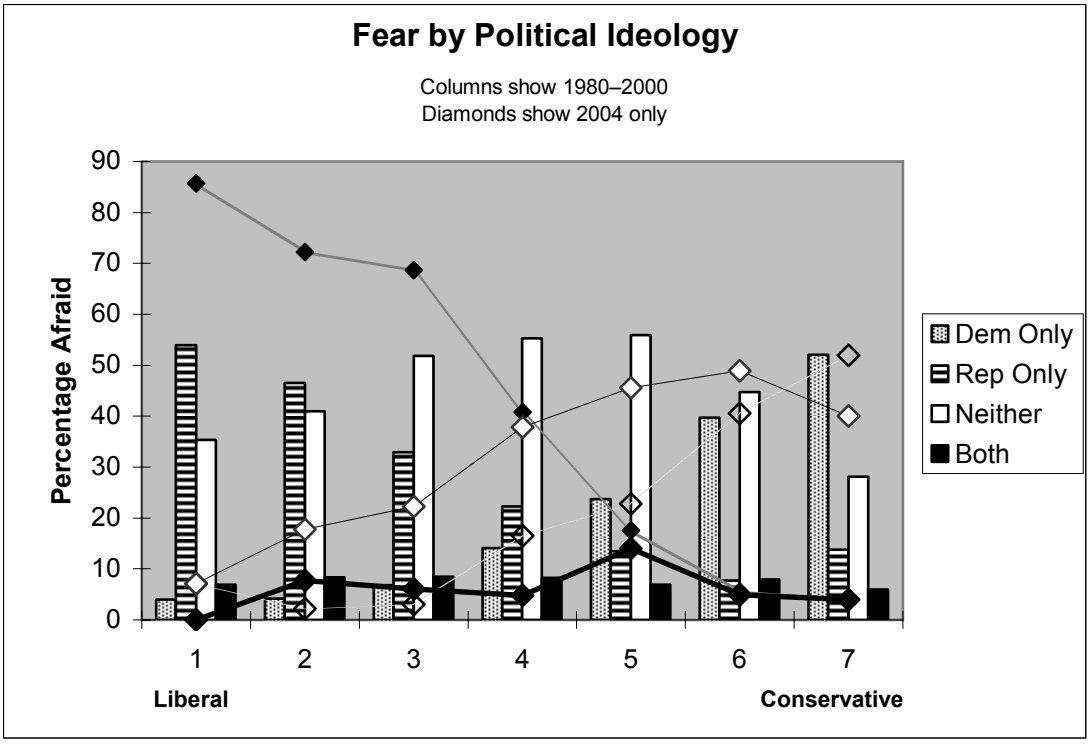

Figure 14: Fear and Ideology

For each voter group on a 7-point ideological scale, the columns in Figure 14 show the percentage of major party voters (aggregated from 1980 through 2000) who expressed fear of the candidates. The diamonds (connected by lines) show the comparable results for the year 2004. As in previous figures, the voters are separated into four distinct groups—those who were afraid of the Democrat, the Republican, both, or neither. So, for example, the figure shows that 86% of self-placed ideological liberals were afraid of George W. Bush in 2004. Comparatively, only 61% of this group had expressed fear of Republicans in previous years (54% of just the Republican, and 7% of both candidates). In contrast, the most conservative voters in 2004 were much less afraid of Bush (8%) than of the average Republican presidential candidate (20% on average), but no more afraid of Kerry than of previous Democrats.

The latter two columns of Table 19 compare regression results on voter fear for 1988 and 2004. Most interesting is the complete reversal of gender effect.[97] Females were much more likely to be afraid in 2004, but much less likely than men in 1988. This disparity again suggests that it is possible to use different types of fear tactics during campaigns in order to target different segments of the population.

But, the data also present an interesting puzzle. Though Clemente and Kleiman's (1977) surveys showed that women were more afraid of crime, and many of the political attacks on Dukakis were designed to emphasize that he was soft on crime, nevertheless the ANES data indicate that men were the most responsive to the Dukakis attacks. Yet, Chapters 6 and 7 link political fear with the more tangible fears of everyday life, which suggests that women would have been more affected by those negative ads. Instead, this example shows that political fear does not always work as political strategists assume. We saw this again in 2004, when fear of Bush greatly surpassed fear of Kerry, despite the best efforts of the Bush campaign and the political pundits to tell us otherwise.

Fear and Vote Choice

Knowing which voters may be more susceptible to negative campaigning via fear tactics is of importance to political campaigns only if this fear factor translates directly or indirectly into votes. The experimental results of Chapters 6 and 7 offer support for a direct effect, so now we look at the ANES data for further substantiation. In order to test for the effects of candidate fear on voting behavior and voter decision-making, we ran a series of binomial probit regressions

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[97] Other significant factors for fear in 1988 were age, political interest, and political ideology, just as in the overall regression. Political interest also mattered in 2004 along with political activism, which had a positive effect in both years but not enough to be significant in 1988. Highly educated voters in both years were more afraid, and finally, only in 2004 did a voter's opinion on the economy have any effect on this response.

using the stated vote decision as the dependent variable.[98] In this analysis we again use ANES data from the seven Presidential election years starting in 1980 and ending in 2004. We again find evidence for a direct relationship between fear and vote choice.

Our results conflict with those of Marcus et al. (2000, 2001), who instead argue for only an indirect link between fear and vote choice, in which afraid voters alter their decision-making criteria, focusing less on party identification and more on ideology and candidate character assessments. But the methods of their studies as well as their results differ from ours. First, they subsume fear and anger into one category, which they call "anxiety", and their results are based upon this variable.

Second and more important is their unusual coding of the anxiety variable, which counts a voter as anxious only if one expressed anger or fear about the candidate of one's own party. As Ladd and Lenz (2008) explain in their critique of Marcus and MacKuen's approach, "Given this coding and the correlation with candidate evaluations, anxiety thus behaves as a measure of disfavor with the candidate of one's party." Certainly, these are an unusual group, and due to their discomfort with their own party's candidate will be less likely to take party identification into account. These are not, however, a fair representation of everyone who is fearful, as in their definition, those afraid of neither candidate are treated equally as those afraid of solely the other party's candidate. There is also no place for independents in this analysis; having no party identification, they by definition can never be anxious. Interestingly, Marcus et al. admit that with the ANES data, their conclusions are not supportable when using voter anxiety (and not own-party anxiety) in interaction terms with party identification, ideology, and character assessments. However, they choose not to highlight this finding, and instead focus on results obtained by using their alternative anxiety formulation.

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[98] A coding of 1 indicated a vote for the Democratic candidate; 0 a vote for the Republican.

After replicating the original findings of Marcus, Neuman, and MacKuen (2000), Ladd and Lenz (2008) also find that the own party anxiety result can also be obtained by replacing the anxiety-party ID interaction term with a term showing interaction between party ID and enthusiasm for the other party's candidate. They again obtain similar results by replacing the anxiety-party ID interaction term with a variable capturing the respondent's feeling thermometer differential between the two candidates. This leads Ladd and Lenz to suggest that the anxiety measure may be endogenous, and that the indirect relationship between vote choice, party ID, and anxiety may instead be just capturing unaccounted for aspects of candidate evaluation. We believe that the relationship between emotion and vote choice is direct, but acknowledge that endogeneity may complicate measurement of this effect.

Results

Our first set of regression results, shown in Table 20, shows the additional explanatory power of adding the emotion variables to a standard model of voter choice. In this table we give the coefficients and the associated standard errors. Details of specific variable coding can be found in the appendix.

Table 20: Determinants of Vote Choice

Independent Variable	(1)	(2)	(3)	(4)
Male	0.00(0.06)	0.00(0.06)	0.03(0.06)	-0.07(0.05)
Education	-0.07(0.04)	-0.07(0.04)	-0.06(0.03)	0.02(0.03)
Black	0.91(0.12)*	0.92(0.12)*	0.96(0.11)*	1.12(0.10)*
Hispanic	0.25(0.13)	0.24(0.13)	0.22(0.13)	0.23(0.11)*
Native American	0.41(0.21)	0.41(0.21)	0.33(0.19)	0.30(0.15)*
Asian	0.00(0.24)	0.00(0.24)	0.02(0.23)	0.00(0.20)
Age 17–34	-0.02(0.07)	-0.02(0.07)	-0.01(0.07)	0.07(0.06)
Age over 55	-0.03(0.07)	-0.03(0.07)	0.01(0.07)	0.07(0.06)
Catholic	0.07(0.07)	0.07(0.07)	0.06(0.07)	0.13(0.06)*
Jewish	0.53(0.20)*	0.52(0.20)*	0.55(0.18)*	0.56(0.16)*
Church Attendance	0.07(0.02)*	0.07(0.02)*	0.09(0.02)*	0.10(0.02)*
West Region	-0.03(0.09)	-0.03(0.09)	-0.01(0.08)	0.06(0.07)
East Region	0.13(0.09)	0.13(0.09)	0.08(0.08)	0.03(0.07)
South Region	-0.11(0.08)	-0.11(0.08)	-0.13(0.07)	-0.11(0.06)
Democrat	0.49(0.07)*	0.43(0.09)*	0.72(0.06)*	0.97(0.05)*
x Fear	--	0.13(0.14)	--	--
Republican	-0.47(0.08)*	-0.55(0.10)*	-0.70(0.07)*	-1.03(0.06)*
x Fear	--	0.22(0.16)	--	--
Ideology	0.19(0.04)*	0.18(0.04)*	0.26(0.03)*	0.38(0.03)*
x Fear	--	0.11(0.30)	--	--
Candidate Evaluation	0.04(0.02)*	0.07(0.02)*	0.15(0.02)*	0.33(0.01)*
x Fear	--	-0.05(0.03)	--	--
Feeling Thermometer	0.03(0.00)*	0.03(0.00)*	--	--
Economic Assessment	0.08(0.04)*	0.07(0.03)*	0.14(0.03)*	0.30(0.03)*
x Fear	-0.01(0.04)	--	--	--
Year: 1984	0.21(0.12)	0.21(0.12)	0.13(0.11)	-0.20(0.09)*
Year: 1988	0.37(0.12)*	0.37(0.12)*	0.18(0.11)	-0.02(0.10)
Year: 1992	0.71(0.15)*	0.71(0.15)*	0.64(0.13)*	0.19(0.11)
Year: 1996	0.67(0.13)*	0.67(0.13)*	0.73(0.12)*	0.51(0.10)*
Year: 2000	0.39(0.14)*	0.39(0.14)*	0.22(0.13)	-0.03(0.11)
Year: 2004	0.36(0.15)*	0.36(0.16)*	0.29(0.14)*	0.00(0.11)
Fear (Democrat)	-0.30(0.11)*	-0.39(0.12)*	-0.52(0.07)*	--
Anger (Democrat)	-0.21(0.07)*	-0.21(0.07)*	-0.46(0.06)*	--
Hope (Democrat)	0.40(0.07)*	0.40(0.07)*	0.82(0.06)*	--
Pride (Democrat)	0.16(0.07)*	0.16(0.07)*	0.42(0.07)*	--
Fear (Republican)	0.24(0.11)*	0.16(0.13)	0.46(0.07)*	--
Anger (Republican)	0.03(0.07)	0.03(0.07)	0.29(0.06)*	--
Hope (Republican)	-0.30(0.07)*	-0.30(0.07)*	-0.63(0.06)*	--
Pride (Republican)	-0.16(0.07)*	-0.15(0.07)*	-0.45(0.07)*	--
Constant	-1.71(0.26)*	-1.67(0.26)*	-2.36(0.23)*	-3.52(0.19)*
N	6144	6144	6144	6144
Pseudo R-squared	0.73	0.73	0.68	0.57
Chi-Squared	6248 (36 DF)	6253 (39 DF)	5790 (34 DF)	4814 (26DF)

Column (4) contains results from a regression on vote choice without the emotion variables. A strong predictor of vote choice is party identification. The direction of impact is

exactly as one would expect, with party identifiers being much more likely to vote for the candidate of their own party. Notice also that retrospective economic assessment also has a much stronger impact here than in the other, more fully specified regressions. The direction of impact for a voter's economic assessment is as expected. Increasingly pro-Democratic assessments lead toward more likely Democratic votes.

The results of all regressions in Table 20 are consistent with the literature (e.g., Campbell et al. 1960, Downs 1957, Kiewiet 1983) in showing that party identification, ideology, and economic assessment play a significant role in vote choice. Also, as column (3) shows, the emotion variables are nearly all significant once included, and have coefficients as one would expect—with positive emotions driving the voter toward a candidate and negative emotions driving them away. A likelihood-ratio test comparing columns (3) and (4) shows that the model including emotions offers a better fit.[99] As Ladd and Lenz (2008) also showed, the inclusion of feeling thermometer differential, in column (1), adds more to the explanatory power of the model, assumedly by addressing unaccounted for portions of the candidate evaluation. However, the information from the thermometer comparison is somewhat redundant with that provided by the other emotional variables; its inclusion reduces the coefficients of the emotion variables and actually deems insignificant the impact of anger against Republican candidates.

Column (2) includes interaction terms between fear and the same three variables as in Marcus et al. (2000): party identification, character evaluation, and policy differences. None of these three terms were significant to vote choice, thus offering no evidence to support the theory that fear is indirectly causing voters to revaluate their party allegiances, ideological leanings, or character assessments. In place of those three interaction terms, column (1) includes an interaction term between fear and voters' retrospective opinion of the economy. This also does

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[99] Likelihood ratio test results comparing (3) and (4): $\chi^2(8) = 975$ ($p = 0.0000$); comparing (1) and (3): $\chi^2(2) = 458$ ($p = 0.0000$); comparing (1) and (2): $\chi^2(3) = 5.5$ ($p = 0.14$).

not end up significant. But, in all three regressions, fear of a candidate has a *direct* effect on vote choice; all other things equal, fear of a candidate makes a voter less likely to choose that candidate at the polls. This is a simple and straightforward explanation, and though perhaps not as intellectually appealing as the more complicated indirect hypothesis, it better comports with the ANES data.

Furthermore, the major non-affective components of vote choice (party, policy, character, and the economy) still have a strong impact even when accounting for voter affect. Since this initially suggests that you can't run from your ideology or your economic record merely by playing to fear, we next conducted a more detailed analysis to substantiate this claim.

For this analysis, we separated voters into two groups of roughly identical size—those who expressed fear of at least one candidate, and those who were unafraid (just as for the dependent variable in Table 19). The purpose of comparing these voter groups was to determine if there are any marked differences between scared and not-scared voters. The results are shown in the middle columns of Table 21.

Table 21: Comparing Unafraid and Afraid Voters

Independent Variable	Unafraid	Afraid	Afraid of Both
Male	-0.05(0.08)	0.06(0.10)	0.06(0.24)
Education	-0.07(0.05)	-0.04(0.06)	0.05(0.14)
Black	1.12(0.16)*	0.67(0.18)*	0.22(0.43)
Hispanic	0.31(0.17)	0.11(0.22)	-0.54(0.51)
Native American	0.55(0.29)	0.31(0.30)	-0.60(1.08)
Asian	-0.11(0.32)	0.08(0.38)	1.44(0.97)
Age 17–34	0.02(0.10)	-0.05(0.11)	0.43(0.28)
Age over 55	-0.05(0.09)	-0.01(0.12)	-0.23(0.30)
Catholic	-0.02(0.09)	0.25(0.11)*	0.53(0.29)
Jewish	0.49(0.27)	0.57(0.31)	-0.27(0.70)
Church Attendance	0.09(0.03)*	0.05(0.04)	0.19(0.10)
West Region	-0.10(0.12)	0.09(0.14)	-0.03(0.33)
East Region	0.23(0.11)*	0.01(0.14)	-0.56(0.38)
South Region	-0.19(0.10)	-0.01(0.12)	-0.34(0.31)
Democrat	0.43(0.09)*	0.57(0.11)*	0.95(0.27)*
Republican	-0.52(0.10)*	-0.41(0.13)*	-0.92(0.33)*
Ideology	0.19(0.05)*	0.21(0.06)*	0.14(0.16)
Candidate Evaluation	0.06(0.03)*	0.04(0.03)	0.00(0.07)
Feeling Thermometer	0.03(0.00)*	0.03(0.00)*	0.04(0.01)*
Economic Assessment	0.10(0.04)*	0.04(0.05)	-0.02(0.12)
Year: 1984	0.26(0.16)	0.17(0.20)	0.63(0.57)
Year: 1988	0.36(0.16)*	0.26(0.21)	0.61(0.54)
Year: 1992	0.74(0.20)*	0.65(0.22)*	1.24(0.54)*
Year: 1996	0.62(0.17)*	0.57(0.20)*	1.18(0.47)*
Year: 2000	0.38(0.18)*	0.32(0.24)	0.82(0.60)
Year: 2004	0.49(0.22)*	0.28(0.23)	1.07(0.61)
Anger (Democrat)	-0.25(0.09)*	-0.23(0.11)*	-0.28(0.27)
Hope (Democrat)	0.44(0.09)*	0.40(0.11)*	0.13(0.29)
Pride (Democrat)	0.21(0.10)*	0.09(0.11)	0.37(0.27)
Anger (Republican)	0.02(0.09)	0.09(0.10)	0.27(0.27)
Hope (Republican)	-0.33(0.09)*	-0.32(0.11)*	0.21(0.28)
Pride (Republican)	-0.26(0.09)*	-0.04(0.12)	-0.37(0.32)
Constant	-1.78(0.34)*	-1.84(0.41)*	-2.67(1.06)*
N	3089	3055	443
Pseudo R-squared	0.68	0.79	0.72
Chi-Squared (33)	2920	3328	439

By playing toward emotions, did candidates muddy the water by causing voters to ignore other assessments? If fearful voters are less likely to use other campaign information, we would expect that the coefficients for these factors would decrease as the voters become more afraid

(and/or significance would decrease below our threshold of $p < .05$).[100] For the most part, unafraid and afraid voters look the same, meaning that they rely on the same criteria for choosing a presidential candidate. Both rely on party identification, ideology, and emotion, though fearful voters do not seem to take pride into account. However, there are three important differences. First, we do not have enough evidence here to suggest that fearful voters engage in retrospective economical voting. This is especially noticeable for voters afraid of both candidates (shown in the last column of Table 21), for whom the coefficient for economic assessments is not significantly different from zero. A second difference involves candidate character evaluations, which are not significant to vote choice for either the entire set of fearful voters or for the subset of voters afraid of both candidates. Finally, if voters afraid of both candidates tend to ignore economic and character assessments, what do they use instead? Our analysis indicates that fearful voters are more likely to fall back on party affiliation. Since voting along party lines is the more comfortable and thus "safer" route for a risk-averse voter, this comports well with Learner and Keltner's (2000, 2001) data showing that fear encourages risk-averse behavior. They will focus on party identification and ideology, both of which are long-term assessments, rather than specific candidate character and recent economic history, which are more election specific. But, recall that part of the affective intelligence hypothesis of Marcus et al. (2000) is that fearful voters largely ignore party affiliations. Our evidence indicates quite the contrary.

Most importantly, though, we argue that candidates try to evoke emotions because these emotions have a strong and direct effect on vote choice. Presidential candidates throughout history have used these emotional appeals with varying degrees of frequency and effectiveness. We now check whether this is reflected in our data. In other words, in any given election year, is there evidence that different campaign styles and/or different character traits of candidates can

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[100] Logically the confidence levels for the subset of voters afraid of both candidates (last column) are lower, because of the smaller group size.

alter the factors relevant to the outcome? If this were the case, we should expect the group of important emotions to change with each election. Table 22 shows the regression results for the two specific years we discussed earlier: 1988 and 2004. Results of the overall regression are repeated in the third column for convenience.

Table 22: Vote Choice in 1988 and 2004

Independent Variable	2004	1988	Overall
Male	0.26(0.20)	0.11(0.14)	0.03(0.06)
Education	0.03(0.12)	-0.03(0.08)	-0.06(0.03)
Black	0.95(0.31)*	0.77(0.26)*	0.96(0.11)*
Hispanic	0.67(0.40)	0.65(0.30)*	0.22(0.13)
Native American	-0.61(0.66)	0.68(0.48)	0.33(0.19)
Asian	-0.35(0.62)	0.48(0.77)	0.02(0.23)
Age 17–34	0.13(0.24)	0.15(0.16)	-0.01(0.07)
Age over 55	0.16(0.23)	0.12(0.16)	0.01(0.07)
Catholic	0.13(0.25)	-0.22(0.17)	0.06(0.07)
Jewish	0.45(0.63)	0.31(0.39)	0.55(0.18)*
Church Attendance	0.10(0.07)	-0.04(0.05)	0.09(0.02)*
West Region	-0.21(0.27)	-0.18(0.19)	-0.01(0.08)
East Region	0.03(0.29)	0.01(0.20)	0.08(0.08)
South Region	-0.49(0.26)	-0.32(0.18)	-0.13(0.07)
Democrat	0.43(0.24)	0.65(0.16)*	0.72(0.06)*
Republican	-0.57(0.25)	-0.83(0.18)*	-0.70(0.07)*
Ideology	0.31(0.11)*	0.20(0.07)*	0.26(0.03)*
Candidate Evaluation	0.21(0.06)*	0.10(0.04)*	0.15(0.02)*
Economic Assessment	0.08(0.10)	0.18(0.08)*	0.14(0.03)*
Fear (Democrat)	-0.57(0.25)*	-0.79(0.18)*	-0.52(0.07)*
Anger (Democrat)	-0.45(0.23)	-0.37(0.15)*	-0.46(0.06)*
Hope (Democrat)	1.17(0.24)*	0.70(0.15)*	0.82(0.06)*
Pride (Democrat)	-0.10(0.23)	0.44(0.16)*	0.42(0.07)*
Fear (Republican)	0.48(0.22)*	0.52(0.20)*	0.46(0.07)*
Anger (Republican)	0.38(0.24)	0.28(0.15)	0.29(0.06)*
Hope (Republican)	-0.50(0.23)*	-0.72(0.15)*	-0.63(0.06)*
Pride (Republican)	-0.68(0.24)*	-0.57(0.16)*	-0.45(0.07)*
Constant	-2.28(0.81)*	-1.42(0.56)*	-2.36(0.23)*
N	739	971	6144
Pseudo R-squared	0.77	0.63	0.68
Chi-Squared	784 (28 DF)	848 (28 DF)	5790 (34 DF)

As Table 22 indicates, looking at only these two election years gives a strong indication that different campaign years elicited different emotions from the voters. For example, in 2004,

the table shows that John Kerry was one of the rare candidates for which a voter expressing pride had no impact.[101] Also, notice the increased impact of fearing Michael Dukakis in 1988, shown by the greater negative magnitude of the fear coefficient. The conventional wisdom from the time was that the Bush campaign heavily concentrated on negative messages evoking fear of their opponent, for example via the Willie Horton and "revolving door" advertisements which insinuated that a President Dukakis would not be effective in combating crime. The data suggests that it worked, though perhaps primarily for men (see Table 19) and certainly not for every segment of the population. Overall, voters were not particularly afraid of a Dukakis presidency, but for those who were afraid, fear of him was a salient factor in their vote decision. All of the previous analysis demonstrates that the candidates (and/or their campaign choices) affect the dimensions upon which the campaign is decided.

When a Voter Becomes Afraid

So next, we approach this data from the viewpoint of a presidential campaign. Given a modal voter, if a campaign was able to make her afraid of the opposition candidate (or assuage her fears of their own candidate), how would that alter her voting propensity?

To test this, we ran a first differences simulation in order to examine the marginal benefit from changing a voter's response to the fear question. We used a modal voter who is a female Protestant with weak or no party identification, and an average assessment of the economy.[102] In the 2004 simulation, this modal voter was 53% likely to vote for George Bush over John Kerry. From 1980–2000, she also voted for the Republican presidential candidate 53% of the time. We then reran the simulation for a modal voter afraid of both candidates. The vote choice results

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[101] Another example comes from the 1996 election (not included in Table 22), in which fear of Bill Clinton was barely relevant. Fear of Clinton had a probit coefficient of -0.19 that was not close to significant (p-value of 0.31).

[102] The modal voter also has a high school degree, is aged 35–54, has an ideological mean, and did not give a positive response to any of the emotion/affect questions. In order to increase the likelihood of voting Democrat to near 50%, we also set the modal voter to rarely attend church.

from the 1980-2000 simulation were similar to the previous aggregate run; once again, in both trials this voter chose the Republican about 53% of the time. The first differences are shown in Table 23 below, with standard errors in parentheses.

Table 23: First Differences on the Likelihood of Voting Democrat

	Democrat Fear (1980–2000)	**Republican Fear (1980–2000)**	**Democrat Fear (2004)**	**Republican Fear (2004)**
Mode: Not afraid	-16.6% (2.7%)	18.2% (2.6%)	-19.6% (8.5%)	17.4% (7.6%)
Mode : Afraid of both	17.2% (3.0%)	-17.7% (2.8%)	20.6% (9.5%)	-16.3% (7.8%)

As Table 23 shows, all of these first differences are in the 16–21% range, so both allaying fears and provoking fears appear to be sound strategy. However, unlike in the years 1980–2000, Democrats in 2004 would have done better with more positive rather than negative campaigning. In other words, John Kerry would have improved his chances had he focused more on reducing voter fear of himself (in essence, more effective positive campaigning). Changing a fearful voter's trepidation of Kerry would have caused a 21% increase (up to 68%) in the likelihood of her voting for the Democrat, while inducing a voter's fright of Bush would cause only a 17% increase. Conversely, the Bush campaign gained more from provoking fear of Kerry via negative campaigning (20%) than from allaying those fearful of their own candidate (17% change).

The results here, which are predicated on the belief that emotional impact differs across elections, also allow us to return briefly to the question of whether the potential endogeneity problem renders the analysis ineffective. The differences across elections once again lead us to believe that even if they are endogenous to vote choice, the emotional evaluation variables are distinct enough to be more informative than Ladd and Lenz (2008) suggest.

Furthermore, the results of the previous two chapters showed a direct relationship between fear and voting, which has been consistently confirmed by the regression analysis in this chapter. However, dual-process theory, which underlies our results, does not in itself suggest a method of specification for the regressions. So, we need to insure that our results linking fear and vote choice were not simply an artifact of the probit estimation model. We tested this with multiple specifications for regression on the dependent variables (fear and vote choice), using the same independent variables we have used throughout this analysis. These regressions are included in the appendix. Table 29 shows our results with fear of either candidate as the dependent variable; this is the same variable we used in Table 19 to discuss who was afraid of the candidates. Also in Table 29, we report results from probit and generalized least squares regressions on fear, conducted both separately from and simultaneously with vote choice—the latter via Seemingly Unrelated Regression (SUR).

We also looked at candidate-specific fear as opposed to general fear. In these regressions, results of which are shown from Table 30 through Table 35, fear of the Democrat and fear of the Republican were treated as separate dependent variables. We used several different regression approaches. First, we obtained estimations using the two candidate-specific fear variables separately. We also estimated for the two variables simultaneously using bivariate probit, and then simultaneously with vote choice using multivariate probit. Next, attempting to correct for potential endogeneity with vote choice, we used instrumented fear variables in a vote choice regression, and then the reverse, using an instrument for vote choice in the two fear regressions. Our instrumentation methods included two-stage and three-stage least squares (assuming the dependent variable to be linear), an analogous two-stage probit technique, and probit maximum likelihood estimation for endogenous regressors. Table 36 and Table 37 contain all the vote choice regressions. More details about each method can be found in the endnotes after the Chapter 8 appendix.

In summary, we found three main results. First, when fearful voters are defined as those afraid of either candidate, the fear equation is not correlated with the vote choice equation (see Table 29, column 2). So, focusing on fear that is not candidate-specific is one way of reducing the problem of endogeneity. Table 29 shows that running fear and vote choice as SUR does not appreciably change the coefficient estimates or standard errors for either. The corresponding results in Table 36 also remain consistent in their estimates and always show a direct relationship between candidate fear and vote choice.

Second, candidate-specific fear appears to be endogenous to vote choice. This can most easily be seen in the multivariate probit regressions on fear of the Democrat, fear of the Republican, and vote choice (Table 31, columns 3–4, Table 34, columns 3–4, and Table 36, columns 5–6). Here, likely due to the recursive relationship between vote choice and candidate-specific fear, correlations between these equations are nearly equal to one, and t-statistics for these three endogenous variables appear artificially high. This suggests that if candidate-specific fear variables are to be focused upon, one or more of these and vote choice must first be instrumented. While instrumenting vote choice in candidate-specific fear regressions (see Table 32, columns 1–4 and Table 35, columns 1–4) worked well, instrumentation of candidate-specific fear in vote choice regressions, as shown in Table 37, did not work as we had hoped. Standard errors from these equations are large enough to render almost every coefficient insignificant. Furthermore, in three of the regressions (columns 1, 2, and 4), the coefficients for fear were reversed. We do not conclude from these that fear of a candidate improves one's chances of voting for that candidate. This result is most likely an artifact of two issues—that the instrument for candidate-specific fear is of poor quality, and that all of the non-instrumented variables in these regressions (such as the other affect variables) are also endogenous to vote choice, so there is no good theoretical reason to instrument just fear of the candidates while leaving every other variable alone.

Third, despite the endogeneity, the direction and often the magnitude of the exogenous variable coefficients are relatively consistent when the specification varies. Thus, we can be confident in the reliability of our predictive variables for general voter fear in Table 29 and vote choice in Table 36; regardless of specification, they are similar to those shown in Table 19 and Table 20. Even for candidate-specific fear, coefficient signs across specifications are remarkably consistent, as shown in Table 30 through Table 35.

Discussion

We have been able to provide clarification regarding what types of voters tend to be afraid of the presidential candidates, how that fear varies across election, and to what degree it affects voter decision-making. First of all, we found that emotions affect vote choice, even when taking into account other historically important factors. We also found that there are many other variables besides vote choice that are instrumental in predicting whether a voter is afraid of the presidential candidates.

We found that the effect of the emotions tends to vary across election years. This suggests that candidates and/or voters make different dimensions salient in every election. Furthermore the negative emotions especially have different import across election years. This implies that candidates can make a difference in the election by either using negatively toned campaign messages to target voter emotions, or designing positively toned campaign material to allay voter fears. For example, we have shown that John Kerry could have done better by pacifying voters whom he had made nervous at some point during the election. This would have been more effective than increasing electoral fear of his opponent George W. Bush, though there was certainly no shortage of voters already spooked by Bush.

While we found that the emotions as measured by the ANES survey have a direct impact on voter decision-making, we found little evidence to indicate that scared voters behave in a substantially different way from other voters. While the idea that a candidate can play to voter emotions in order to drown out his poor economic record is still possible given the data, the theory that fear deflects a voter's reliance upon party identification is not merited by this analysis.

However, in order to better test these ideas going forward, we will need a method that allows us to more readily focus on how emotional considerations affect people making political decisions. Surveys are unfortunately an indirect way of gauging voter emotion, and survey-based measurement of emotional reactions to political candidates may introduce many forms of error into our analysis, ranging from simple measurement error to other more severe problems like endogeneity (for a review, see Cacioppo and Gardner 1999). It is possible that endogeneity does plague the use of candidate emotional evaluations for studying voter choice, and it is also possible that future research could attempt to deal with this potential endogeneity (at least to more systematically test for it than we have done here) statistically. But given our experience with multi-equation methods that attempt to deal with endogeneity in choice models (Alvarez and Glasgow 1999), we are pessimistic that we have sufficient theoretical knowledge, or sufficient survey data, to successfully implement these models in the data at hand.

So we suggest that a more exact method of testing these ideas will rely on using different experimental methods, most notably the theories and methods of experimental social neuroscience, as demonstrated in Chapter 7. In the neuroscience laboratory, we will not only be better able to isolate the political decision-making process via specific subject tasks, but also be able to analyze brain activations to get a better understanding of how and when the different emotions impact each decision. We see that further experimental work will likely be the most constructive research direction for better understanding not just how emotional reactions to candidates factor into voter decision-making (e.g., Todorov et al. 2005), but also how all forms of

negative campaigning affect specific subsets of voters, in turn affecting candidates' strategies and election results.

Conclusion

This work ise divided into two major sections. The first, which consists of Chapters 2 and 3, presents a formal model of campaign strategy. Here, I showed specific situations that make candidates more likely to engage in negative campaigning: when they are facing an opponent of poor character, when voters prefer character information, and when voters exhibit a positivity offset toward hypothetical candidates. I also showed that if the goal is to improve voter welfare from the election process (i.e., elect better candidates), that we should focus on reducing candidates' incentives to provide false information—regardless of whether that false information is about themselves or about their opponent(s). An alternative approach, circumscribing specific campaign types (either *de jure* or *de facto*), leads to ambiguous welfare outcomes, so uncovering candidates' lies is more preferable.

The second section, beginning with Chapter 4, used empirical methods to test the results of the formal model and the implications of those results. In addition to confirming the aforementioned comparative statics hypothesis, I found that voter behavior is largely naïve regarding inferences that might be derived from campaigns that the candidates did not choose; unlike Sherlock Holmes, voters would not impute attributes to candidates that fail to bark.

Also, the results from experiments on voter behavior (Chapters 6 and 7) showed the link between invoking fear—a common negative campaigning technique—and election outcomes. These two chapters are an excellent launching point for future research into the question of how negative campaigning tactics work to influence voting decisions. Chapters 5 and 8 should serve as a reminder that we cannot achieve this knowledge if we rely on survey methods alone, which are limited in explanatory power.

Finally, as mentioned in the introduction, the first step toward understanding how negative campaigning works—and when candidates are more likely to use it—is to create a

meaningful definition of negative campaigning to use consistently across studies. Currently, the empirical literature does not collectively meet this requirement, and the different opinions about what constitutes a negative campaign have led to inconsistent results. Just as with the literature on negative campaigning, the literature on voter affect lacks a consistent formal theoretical foundation. As Chapter 8 exemplifies, approaches focused mainly on survey data have caused—possibly from either an inherent endogeneity problem or a lack of specific concept direction in the questions—complications that produce disparate findings, such as ours and that of Marcus, Neuman, and MacKuen (2000). The result of Marcus et al., that an indirect relationship exists between voter affect and voting decisions, exemplifies this problem because their result is very specific to their definition of voter anxiety. The literature on negative campaigning will continue to be irreconcilable until researchers base their work upon a foundation of formal theory and utilize a more complete array of experimental methodology.

Appendices

Chapter 2 Appendix

Codebook for Commonly Used Symbols

Variable	Explanation
p	Probability of a candidate drawing positive character traits (x)
q	Probability of a candidate drawing an extremist ideology
P	The greater of the two quantities p and 1-p
Q	The greater of the quantities 2q and 1-2q
x	Positive valence, as opposed to –x. Also serves as the weight the voter places on character relative to ideology.
Ω	A candidate's probability of winning the election
a	Any campaign action
$d_\ell(a_\ell, a_{-\ell})$	The benefit to candidate ℓ from employing campaign announcement a_ℓ with voter posterior beliefs μ and the opponent using strategy $a_{-\ell}$.
A^*	A campaign message that maximizes $d_\ell(a_\ell)$ where voter beliefs μ are naïve.
$-a^*$	The other campaign theme on the same dimension as a^*. For instance, if a^* is positive campaigning, then $-a^*$ is negative campaigning.
a^{**}	The campaign message on the opposite dimension from a^* that maximizes $d_\ell(a_\ell)$ when voter beliefs μ are naïve.
$-a^{**}$	The other campaign theme on the same dimension as a^{**}.
a''	Any campaign theme on the opposite dimension from a^*.

A Note on Candidates' Type Distributions

If the distribution of possible values for each candidate changes, it doesn't change strategy—just the likelihood of winning. For example, suppose that candidate A may be either x_1 or x_2, where $x_1 + x_2 \neq 0$. This change can be transformed about zero by focusing on the difference between the two values. Thus, assuming that $x_1 > x_2$,

Type	Probability
x_1	p
x_2	1-p

can be transformed into:

Type	Probability
$\frac{x_1+x_2}{x_2} + \frac{x_1-x_2}{x_2}$	p
$\frac{x_1+x_2}{x_2} - \frac{x_1-x_2}{x_2}$	1-p

.

The transformed utility function has a constant portion, $\frac{x_1+x_2}{x_2}$, and a variable portion that depends on the random draw. The utility from electing candidate A would then be $-2q + \frac{x_1+x_2}{x_2} + \frac{x_1-x_2}{x_2}(2p-1)$. Then, with $\frac{x_1-x_2}{x_2} = x_A$, campaign strategies could be carried out just as with the original $\{x,-x\}$ distribution, because while the constant term could affect the election outcome, it will have no effect on the strategies. This same type of adjustment works on the issue dimension once it is simplified into two components: extremist $(I_\ell = \pm 1)$ or not extremist $(I_\ell = 0)$.

Proof of Proposition 1:

First, I show that a candidate ℓ using a^* has no incentive to deviate. Suppose that the opponent -ℓ is using a^*, and that using a^* changes the voter utility differential by ν. By definition of a^*, for all other themes $a' \neq a^*$, it is true that $\max d_\ell(a'_\ell, a^*) = w \leq \nu$, because ν maximizes $d_\ell(a)$ and because choosing $a' \neq a^*$ reduces d_ℓ further by some non-negative amount due to the inference that ℓ didn't choose a^*. So, candidate ℓ does best by not deviating from a^*. By the same logic, it follows that if the opponent -ℓ is using $a'' \neq a^*$, there is also no incentive to deviate because $d_\ell(a^*, a''_{-\ell}) \geq d_\ell(a'_\ell, a''_{-\ell})$ for all $a'_\ell \neq a^*$.

Next, I show that candidates unable to use a^* will have no incentive to deviate. Suppose that the opponent is using a^*, but for candidate ℓ, using a^* would be harmful. Let $d_\ell(a^{**}, a^*) = w'$. For all other themes $a' \notin \{a^*, a^{**}\}$, $\max d_\ell(a_\ell', a^*) = w'' \leq w'$, because w' maximizes $d_\ell(a)$ on the dimension of a^{**} and because choosing $a' \neq a^{**}$ reduces d_ℓ further by some non-negative amount due to the inference that ℓ didn't choose a^{**}. For candidates using $-a^{**}$, the only possible deviation is to not campaign, after which the voter will assume $-a^{**}$ is false, but change no other beliefs, which is strictly worse for the candidate. Finally, if both candidates are unable to use a^*, the voter will have full information, so no change in campaign strategy will impact the probability of winning.

Showing the voter's optimal strategy for this equilibrium is simple. She uses $\tilde{\tau}(a) = (1,0)$, for ℓ and -ℓ, respectively, whenever $E_\mu U_V(\ell) > E_\mu U_V(-\ell)$, because always voting for ℓ in this case maximizes her expected utility $E_\mu U_V(\tilde{s}, \tau)$. In the case where $E_\mu U_V(\ell) = E_\mu U_V(-\ell)$, $\tilde{\tau} = (\frac{1}{2}, \frac{1}{2})$ is weakly dominant because all strategies $\tilde{\tau}(a)$ give the same expected payoff. ■

Blackwell (1953) Information and the Proposition 1 Equilibrium

First, note that there is no pure strategy equilibrium in which the voter gets perfect information in each of the sixteen different cases of candidate types. I will demonstrate this for symmetric equilibria only, but this proof can be extended to include asymmetric equilibria as well. There are four separate cases in which candidates are equal on one dimension but not the other. For example, take the case (1) where Candidate A is $(0, x)$ and Candidate B is $(0, -x)$. To provide perfect information, Candidate A must choose a character campaign (say positive campaigning), or otherwise B can match A's campaign. In case (1), B must choose issue bolstering; B must campaign to differentiate from $(0, x)$ versus $(\pm 1, -x)$.

Now, in case (2), where Candidate A is $(\pm 1, x)$ and Candidate B is $(\pm 1, -x)$, Candidate A must choose negative campaigning while B chooses issue differentiation. If A instead chooses positive campaigning, then it is not possible to differentiate case (3) where Candidate A is $(\pm 1, x)$ and Candidate B is $(0, x)$. In the latter, no matter which issue campaign B chooses, A can choose positive campaigning to match case (1) or (2).

If instead, A chooses negative campaigning in case (2), then in case (3), B must choose issue differentiation (because A uses positive campaigning). Now, in case (4), where Candidate A is $(\pm 1, -x)$ and Candidate B is $(0, -x)$, B must choose issue bolstering (because A uses negative campaigning). So far, these strategies differentiate the four cases. But now, for case (5), when Candidate A is $(\pm 1, x)$ and Candidate B is $(0, -x)$, A must campaign on the character dimension while B campaigns on issues. Whatever themes the candidates use will be the same as those for one of cases (1)–(4).

Thus, even the most informative equilibrium will be unable to distinguish between candidates in at least one of these five cases. Without loss of generality, suppose that a^* is positive campaigning, and that a^{**} is issue bolstering. Then, in the Proposition 1 equilibrium, the

only voter utility loss occurs when the two candidates are $(0,\ x)$ and $(\pm 1,\ x)$. Here, the voter loses $\frac{1}{2}p^2 2q(1-2q)$ of expected utility. By the definitions of a^* and a^{**}, $p \le (1-p)$, $2q \ge 1-2q$, and $x \ge \frac{1}{2}$. As a result, the loss of information in any of the other four cases will cause a greater loss in expected voter utility, and therefore the Proposition 1 equilibrium is the most informative.

■

PROPOSITION 14: *The following is always an equilibrium. Candidates choose -a*, which is the other theme on the same dimension as the optimal theme a* from Proposition 1, if -a* is available (i.e., does not reveal information harmful to the campaigner). If unable to use -a*, candidates choose some theme* $a"$ *from the opposite dimension. If unable to choose either of these two themes, candidates try* $-a"$ *(the other theme on the same dimension as* $a"$*) and then the redundant a*. If none of these are available, candidates do not campaign. If any candidate uses a harmful campaign or does not campaign (i.e., reveals bad information about himself, or good information about the opponent), then he is assumed to have two negative traits* $(\pm 1, -x)$ *and his opponent two positive traits* $(0,\ x)$.[103]

Proof of Proposition 14:

This is very similar to the proof for Proposition 1. First, I show that a candidate using $-a^*$ has no incentive to deviate. Suppose that the opponent -ℓ is using $-a^*$, and that a^* changes the voter utility differential by ν. By definition of a^*, for all other themes $a' \neq a^*$, it is true that $\max d_\ell\left(a_\ell', -a^*\right) = w \leq \nu$, because a^* would be a harmful campaign (since the opponent is using $-a^*$), and ν maximizes $d_\ell(a)$ for all themes $a' \neq a^*$. So, candidate ℓ does best by choosing $-a^*$. Now suppose that the opponent -ℓ is using $a' \neq -a^*$. By the same logic, ℓ does not gain from switching to any $a' \neq -a^*$. Also, ℓ cannot gain by switching to a^*. Whenever the opponent fails to reveal $-a^*$, the voter assumes $-a^*$ would be harmful to -ℓ, so if ℓ deviated from $-a^*$ to a^*, he would provide redundant information to the voter, who would also assume that $-a^*$, $a"$, and $-a"$ would be harmful to ℓ. Thus ℓ has no incentive to deviate from choosing $-a^*$.

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[103] The voter's strategy, the probability of voting for each candidate, is $(1, 0)$ for ℓ and -ℓ, respectively, whenever $E_\mu U_V(\ell) > E_\mu U_V(-\ell)$. In the case where $E_\mu U_V(\ell) = E_\mu U_V(-\ell)$, then $\tilde{\tau} = (\frac{1}{2}, \frac{1}{2})$.

Next, I show that candidates unable to use $-a^*$ will have no incentive to deviate. Suppose that the opponent is using $-a^*$, but for candidate ℓ, using $-a^*$ would be harmful. If ℓ can use theme $a"$ but deviates to $-a"$, then the voter assumes $a"$ would be false, and so the candidate loses $d_\ell(-a") = w'$ (as if the opponent used $-a"$), but gains the same $d_\ell(-a") = w'$ and thus breaks even from the deviation. If ℓ cannot use theme $a"$ and is using $-a"$, then the only possible deviation is to not campaign, which is strictly worse since the voter will now assume $-a"$ is false. Suppose instead that the opponent is using $a"$ or $-a"$; then the only possible deviations would be to either choose a^* (which is redundant) or $\varnothing$, after which they would also assume that $a"$ and $-a"$ would be harmful to ℓ. Finally, if both candidates are unable to use $-a^*$, the voter will have full information, so no change in campaign strategy will impact the probability of winning.

The voter's strategy is $\tilde{\tau}(a) = (1,0)$, for ℓ and -ℓ, respectively, whenever $E_\mu U_V(\ell) > E_\mu U_V(-\ell)$, because always voting for ℓ in this case maximizes her expected utility $E_\mu U_V(\tilde{s}, \tau)$. In the case where $E_\mu U_V(\ell) = E_\mu U_V(-\ell)$, $\tilde{\tau} = (\frac{1}{2}, \frac{1}{2})$ is weakly dominant because all strategies $\tilde{\tau}(a)$ give the same expected payoff.

Chapter 3 Appendix

Codebook for Commonly Used Symbols

Variable	Explanation
p	Probability of a candidate drawing positive character traits (x)
q	Probability of a candidate drawing an extremist ideology
P	The greater of the two quantities p and 1-p
Q	The greater of the quantities 2q and 1-2q
x	Positive valence, as opposed to –x. Also serves as the weight the voter places on character relative to ideology.
ω	A candidate's probability of winning the election
β	A candidate's benefit from office holding
π	Probability of false campaign statements being revealed
κ	Penalty for being caught lying
γ	Indictor variable for whether a candidate has been caught lying
a	Any campaign action
a^*	A campaign message that maximizes the difference in voter utility between candidates $d_\ell(a_\ell,\gamma)$ where voter beliefs μ are naïve.
$-a^*$	The other campaign theme on the same dimension as a^*. For instance, if a^* is positive campaigning, then $-a^*$ is negative campaigning.
a^{**}	The campaign message on the opposite dimension from a^* that maximizes $d_\ell(a_\ell,\gamma)$ when voter beliefs μ are naïve.
$-a^{**}$	The other campaign theme on the same dimension as a^{**}.
$a^{(M)}$	The Mth best campaign option, ordered by effect on $d_\ell(a_\ell,\gamma)$. M can be true (represented by m) or false (denoted by $\tilde{m}$).

Proof of Proposition 8: In equilibrium, candidates are facing an opponent using either a^* truthfully, a^{**} truthfully, or a^* falsely. Candidates facing any of these cannot have the incentive to defect.

First, it must be shown that candidates always prefer choosing a^* over choosing a^{**} when both are true. This is not trivial because the voter knows that a candidate revealing a^* might be lying (even if not caught), while a candidate revealing a^{**} is always telling the truth. It is true whenever $E_\mu(U_V(\ell)\,|\,(a^*,a^{**},(0,0))) \geq E_\mu(U_V(-\ell)\,|\,a^*,a^{**},(0,0)))$, which means that the sophisticated voting strategy would be $\tau_\ell((a_\ell^*,a_{-\ell}^{**}),(0,0))) \geq \frac{1}{2}$. This is equation (14).

When the opponent uses a^* truthfully, an opponent must prefer to use a^{**} truthfully over lying with a^* and over any off-path defection (not campaigning is just as good as any other because voters believe the worst of all defectors). The expected value after a^{**} is $\beta\varepsilon(d_\ell((a^{**},a^*),(0,0)))$, the expected value after a^* false is $\frac{\beta(1-\pi)}{2}+\pi(\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0)))-\kappa)$, and the expected value after not campaigning is $\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0)))$. Thus if equation (11) holds, candidates facing an opponent using a^* truthfully will not defect.

When the opponent uses a^{**} truthfully, an opponent must prefer to use a^{**} truthfully over lying with a^* and over any off-path defection (again, not campaigning is just as good as any other because voters believe the worst of all defectors). The expected value after a^{**} is $\frac{\beta}{2}$, the expected value after a^* false is $\beta(1-\pi)(1-\varepsilon(d_\ell((a^*,a^{**}),(0,0))))+\pi(\beta\varepsilon(d_\ell((\varnothing,a^{**}))-\kappa)$, and the expected value after not campaigning is $\beta\varepsilon(d_\ell((\varnothing,a^{**}))$. Thus if equation (12) holds, candidates facing an opponent using a^{**} truthfully will not defect.

When the opponent lies with a^*, again the opponent must prefer to use a^{**} truthfully over lying with a^* and over any off-path defection. Now, the expected value after a^{**} is

$\pi\beta\varepsilon(d_\ell((a^{**},a^*),(0,0))) + (1-\pi)\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0)))\ \frac{\beta}{2}$, the expected value after a^* false is $\frac{\beta}{2} - \kappa\pi$, and the expected value after not campaigning is $\frac{\beta}{2}\pi + (1-\pi)\beta\varepsilon(d_\ell((\varnothing,a^*),(0,0)))$. Thus if equation (13) holds, candidates will not defect facing an opponent using a^* falsely. ■

Proof of Proposition 10: Without loss of generality, let $\gamma_A > \gamma_B$. Suppose that candidate A and B choose conflicting strategies (i.e., negative vs. positive campaigning; issue bolstering vs. issue differentiation). Since A is more likely to win, then B is better off matching A's strategy. For example, if A is negative campaigning, then B should switch to negative campaigning. Now both candidates are equally likely to win. But, A is better off choosing the strategy that conflicts with B, which creates a cycle. Suppose instead that A and B start out choosing different but non-conflicting strategies. If A is more likely to win, then B can do better by matching A's strategy. If the election is a tie, or if B is more likely to win, A can do better by choosing the strategy that conflicts with B. ■

Proof of Proposition 11: Without loss of generality, let $\gamma_A > \gamma_B$ and suppose in equilibrium for some type(s) θ that candidate A chooses negative campaigning while B chooses positive campaigning. Since this is part of an equilibrium, both candidates must do worse from any issue campaign, or by not campaigning. Also, if B is lying, then B does better with negative campaigning regardless of its truth. So, A must be lying. Now, B would do better with negative campaigning if it is true, so it must be that negative campaigning is false for B. The following two equations must hold:

$$(\pi + (1-\pi)\rho_B)(\beta\varepsilon((PC,\varnothing),(0,0)) - \kappa) + (1-\pi)(1-\rho_B)\beta(1-\varepsilon((NC,\varnothing),(0,0))) \geq \tfrac{\beta}{2} \quad (24)$$

$$(\pi + (1-\pi)\rho_B)(\beta(1-\varepsilon((PC,\varnothing),(0,0))) + (1-\pi)(1-\rho_B)(\beta\varepsilon((NC,\varnothing),(0,0)) - \kappa) \geq \tfrac{\beta}{2} - \pi\kappa\,. \quad (25)$$

Equation (24) says that candidate A does better from the conflict than from instead choosing positive campaigning, which would be true. Equation (25) says that candidate B does better from the conflict than from lying with positive campaigning. However, if both (24) and (25) are true, adding them together yields the inequality $1-\kappa \geq 1-\pi\kappa$, which holds only when $\pi = 0$. Furthermore, for both (24) and (25) to hold when $\pi = 0$, it must be that $\rho_B = \frac{1}{2}$.

Proof of Proposition 13: The following algorithm can be used to find an equilibrium for each set of candidate types $\theta \in \Theta$. Let candidate ℓ be the candidate with the higher credibility score. For candidate -ℓ, choose the campaign $a^{(J)}$ that maximizes $a^{(J)} \in \max\{d_\ell(a^{(j)},\varnothing)\xi + (1-\xi)((1-\pi)d_\ell(a^{(\tilde{j})},\varnothing) + \pi(d_\ell(a^{(\tilde{j})},\varnothing)-\kappa))\}$, where $\xi = 0$ if the campaign *j* is false (and thus notated by $a^{(\tilde{j})}$), and $\xi = 1$ if the campaign *j* is true (and thus notated by $a^{(j)}$). For candidate ℓ, choose the campaign from the set $\{a^{(K)}, -a^{(K)}, a^{(J)}, \varnothing\}$, where $a^{(K)}$ and $-a^{(K)}$ are defined to be on the opposite dimension from $a^{(J)}$, that maximizes $a^{(M)} \in \max_{a^{(M)} \neq -a^{(J)}} \{d_\ell(a^{(m)},\varnothing)\xi + (1-\xi)((1-\pi)d_\ell(a^{(\tilde{m})},\varnothing) + \pi(d_\ell(a^{(\tilde{m})},\varnothing)-\kappa))\}$. From this maximization and by conditions (18)–(20), it follows that candidate ℓ will have no incentive to deviate. Furthermore, candidate -ℓ will only have incentive to deviate if $\omega_{-\ell}(a_{-\ell}^{(J)}, a_{-\ell}^{(M)}, \tilde{\tau}, (\theta_{\ell,}\theta_{-\ell})) < \omega_\ell(-a_{-\ell}^{(M)}, a_\ell^{(M)}, \tilde{\tau}, (\theta_{\ell,}\theta_{-\ell}), \rho_{-\ell})$. However, if this condition holds, then because $\rho_{-\ell} \leq \rho_\ell$, it would also be true that $\omega_\ell(a_\ell^{(J)}, a_\ell^{(M)}, \tilde{\tau}, (\theta_{-\ell,}\theta_\ell)) < \omega_\ell(-a_\ell^{(M)}, a_\ell^{(M)}, \tilde{\tau}, (\theta_{-\ell,}\theta_\ell), \rho_\ell)$; in other words, ℓ would also have the incentive to deviate if the campaigns and types were reversed. But since $\max\{d_\ell(a^{(j)},\varnothing)\xi + (1-\xi)((1-\pi)d_\ell(a^{(\tilde{j})},\varnothing) + \pi(d_\ell(a^{(\tilde{j})},\varnothing)-\kappa))\}$ is the same for both candidates, we know that for candidate ℓ, $a^{(J)}$ is the best non-conflicting response to $a^{(M)}$, and

so it follows that $\omega_\ell(a_\ell^{(J)}, a_\ell^{(M)}, \tilde{\tau}, (\theta_{-\ell}, \theta_\ell)) \geq \omega_\ell(-a_\ell^{(M)}, a_\ell^{(M)}, \tilde{\tau}, (\theta_{-\ell}, \theta_\ell), \rho_\ell)$. By contradiction, these two campaigns ($a^{(M)}, a^{(J)}$) are part of the equilibrium strategy for candidate types θ. ■

Chapter 4 Appendix

Script of Instructions

Thank you for agreeing to participate in this research experiment. During the experiment we require your complete, undistracted attention. So please follow these instructions carefully. You may not open other applications on your computer, talk with the other participants, or engage in other activities, such as using your cell phones or headphones, reading books, etc.

You will be paid in cash at the end of the experiment. Different participants may earn different amounts. What you earn depends partly on your decisions, partly on the decisions of others, and partly on chance. So it is important that you listen carefully to the following instructions.

You will be playing a series of three player games. In each match, you will be placed randomly in a group of three players. In each group of three, two of you will be given the role of candidates, and one will be the voter. The candidates will be randomly assigned two traits, X and Y. Either trait can be positive or negative, so there are four possibilities for each candidate. You could be positive on both X and Y, positive on X and negative on Y, negative on X and positive on Y, or negative on both. The candidates will know their own traits and the opponent's traits. The voter will not know the traits, but will know the probability that a candidate received positive or negative traits.

The game has two stages. In stage one, each candidate will reveal one piece of information to the voter. This one piece of information can either be the candidate's own X trait, own Y trait, the opponent's X trait, or the opponent's Y trait. The voter does not receive this information until both candidates have chosen.

In stage two, after both candidates have sent information to the voter, the voter chooses the best candidate. Candidates receive 100 points if they win the vote, and 0 if they lose. Voters

get points based upon the quality of the candidate they vote for. At the end of the experiment, your point total will be converted to cash.

[Show example candidate screen (Figure 15).]

The entire experiment will take place through computer terminals. If you are a candidate, the screen looks like this. The top of the screen shows the probability of getting a positive X trait, and the probability of getting a positive Y trait. In this example, the probability of a positive X trait is .5, so that means each candidate has a 50% chance of getting a positive trait.

Here [point to screen] are the voter payoffs for choosing a candidate. In this example, the voter receives 100 if the chosen candidate is positive on both X and Y, 80 if the candidate is positive on X only, 20 if the candidate is positive on Y only, and 0 if the candidate is negative on both X and Y.

You will be shown whether you are positive or negative on X and Y, and also whether the opponent is positive or negative on X and Y. You will also be given a choice of what to reveal to the voter.

[Show example voter screen (Figure 16).]

If you are a voter, the top of your screen will be blank until the candidates make their selections. After the candidates choose, it will look like this. You will see their statements, and now must choose a candidate. To vote, just click on the button corresponding to the candidate you want to choose. After the vote, all players will be told their payoffs, and who won the election.

Also, after the vote you will be randomly placed in a new group of three people, and randomly assigned a new role as the voter or as one of the two candidates. Are there any questions?

Please double-click on the desktop icon that says “Campaign”. At the prompt, type your first and last name. Then click “Submit” and wait for further instructions.

In this first round, the probability of being positive on X is 50%, and the probability of being positive on Y is also 50%. I will alert everyone whenever that is going to change. The game starts now, so good luck!

Figures and Tables

Table 24: QRE/CE Probability of Voting for Candidate ℓ (row) over Candidate –ℓ (column)

		X	Y	oX	oY	Ø
30% Treatment	X	0.50	0.85	0.50	0.93	0.95
	Y	0.15	0.50	0.63	0.50	0.78
	oX	0.50	0.37	0.50	0.61	0.64
	oY	0.07	0.50	0.39	0.50	0.53
	Ø	0.05	0.22	0.36	0.47	0.50
50% Treatment						
	X	0.50	0.82	0.50	0.88	0.93
	Y	0.18	0.50	0.49	0.50	0.77
	oX	0.50	0.51	0.50	0.68	0.72
	oY	0.12	0.50	0.32	0.50	0.55
	Ø	0.07	0.23	0.28	0.45	0.50
70% Treatment						
	X	0.50	0.78	0.50	0.81	0.91
	Y	0.22	0.50	0.35	0.50	0.76
	oX	0.50	0.65	0.50	0.74	0.79
	oY	0.19	0.50	0.26	0.50	0.57
	Ø	0.09	0.24	0.21	0.43	0.50

Table 25: Candidates' Preferred Strategies

			30% Treatment		50% Treatment		70% Treatment	
Case	Self	Opp.	First Choice	Second Choice	First Choice	Second Choice	First Choice	Second Choice
1	(+, +)	(+, +)	X (90%)*	Y (10%)	X (100%)*	n/a	X (96%)*	Y (4%)
2	(+, +)	(+, -)	X (100%)*	n/a	X (93%)*	oY (6%)	X (86%)*	oY (14%)
3	(+, +)	(-, +)	X (100%)*	n/a	X (85%)*	oX (15%)	X (82%)*	oX (18%)
4	(+, +)	(-, -)	X (96%)*	oX (4%)	X (90%)*	oX (8%)	X (90%)*	oX (8%)
5	(+, -)	(+, +)	X (100%)*	n/a	X (100%)*	n/a	X (100%)*	n/a
6	(+, -)	(+, -)	X (97%)*	oY (3%)	X (91%)*	oY (9%)	X (97%)*	oY (3%)
7	(+, -)	(-, +)	X (100%)*	n/a	X (77%)*	oX (23%)	X (84%)*	oX (16%)
8	(+, -)	(-, -)	X (93%)*	oX (5%)	X (95%)*	oX (5%)	X (80%)*	oX (20%)
9	(-, +)	(+, +)	Y (92%)*	Ø (8%)	Y (88%)*	Ø (12%)	Y (92%)*	Ø (8%)
10	(-, +)	(+, -)	Y (73%)*	oY (23%)	Y (52%)	oY (48%)	oY (52%)	Y (48%)
11	(-, +)	(-, +)	Y (71%)*	oX (29%)	Y (62%)	oX (38%)	oX (57%)	Y (43%)
12	(-, +)	(-, -)	Y (84%)*	oX (16%)	Y (59%)	oX (41%)	Y (75%)	oX (13%)
13	(-, -)	(+, +)	Ø (100%)*	n/a	Ø (100%)*	n/a	Ø (100%)*	n/a
14	(-, -)	(+, -)	oY (82%)*	Ø (18%)	oY (88%)*	Ø (12%)	oY (94%)*	Ø (6%)
15	(-, -)	(-, +)	oX (100%)*	n/a	oX (100%)*	n/a	oX (100%)*	n/a
16	(-, -)	(-, -)	oX (87%)*	oY (13%)	oX (90%)*	oY (5%)	oX (75%)	oY (25%)

* First choice campaigns marked with * are significant with a p-value of .05 or less, with the null hypothesis that the first choice campaign is chosen only 50% of the time, and all other options combined are chosen 50% of the time.

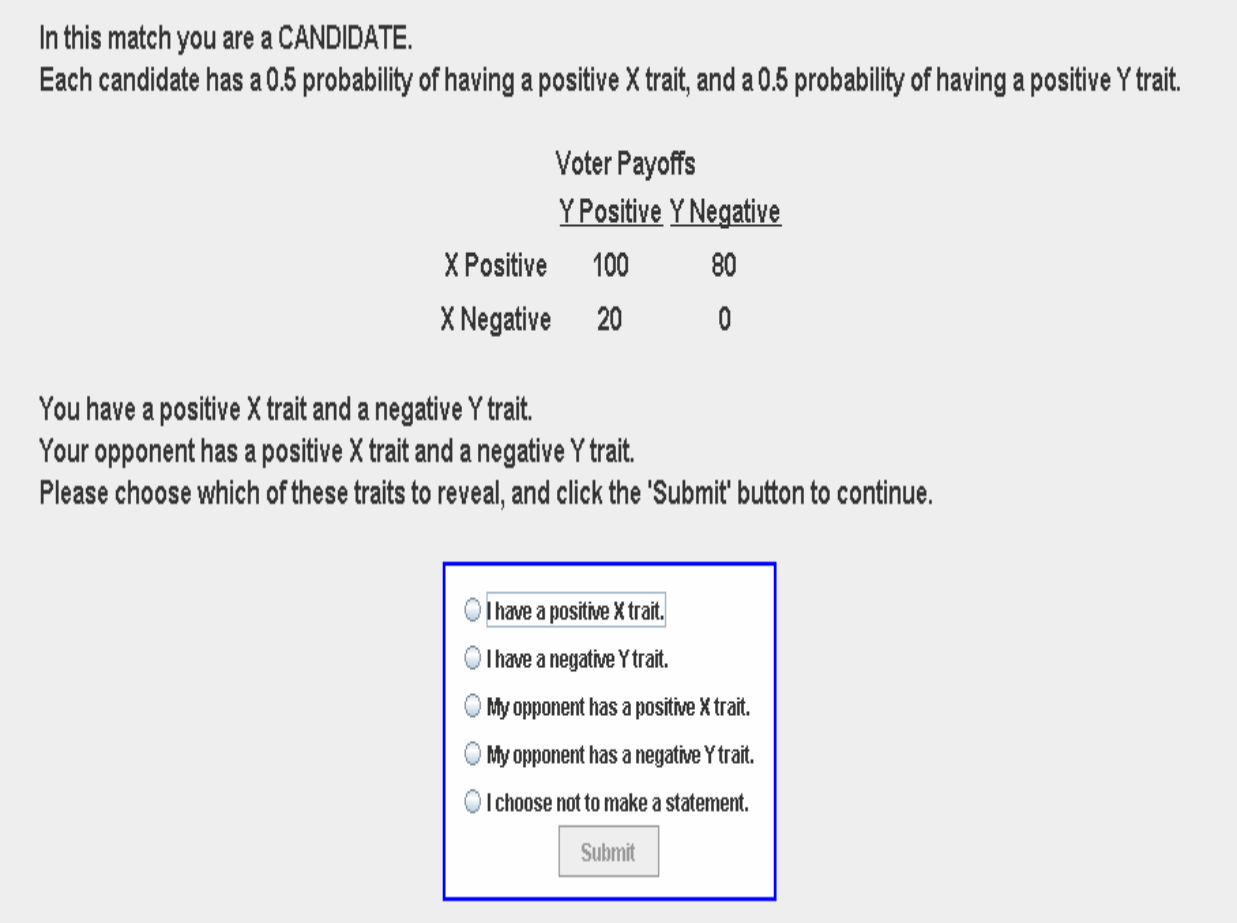

Figure 15: Example Screen for Players in the Candidate Role

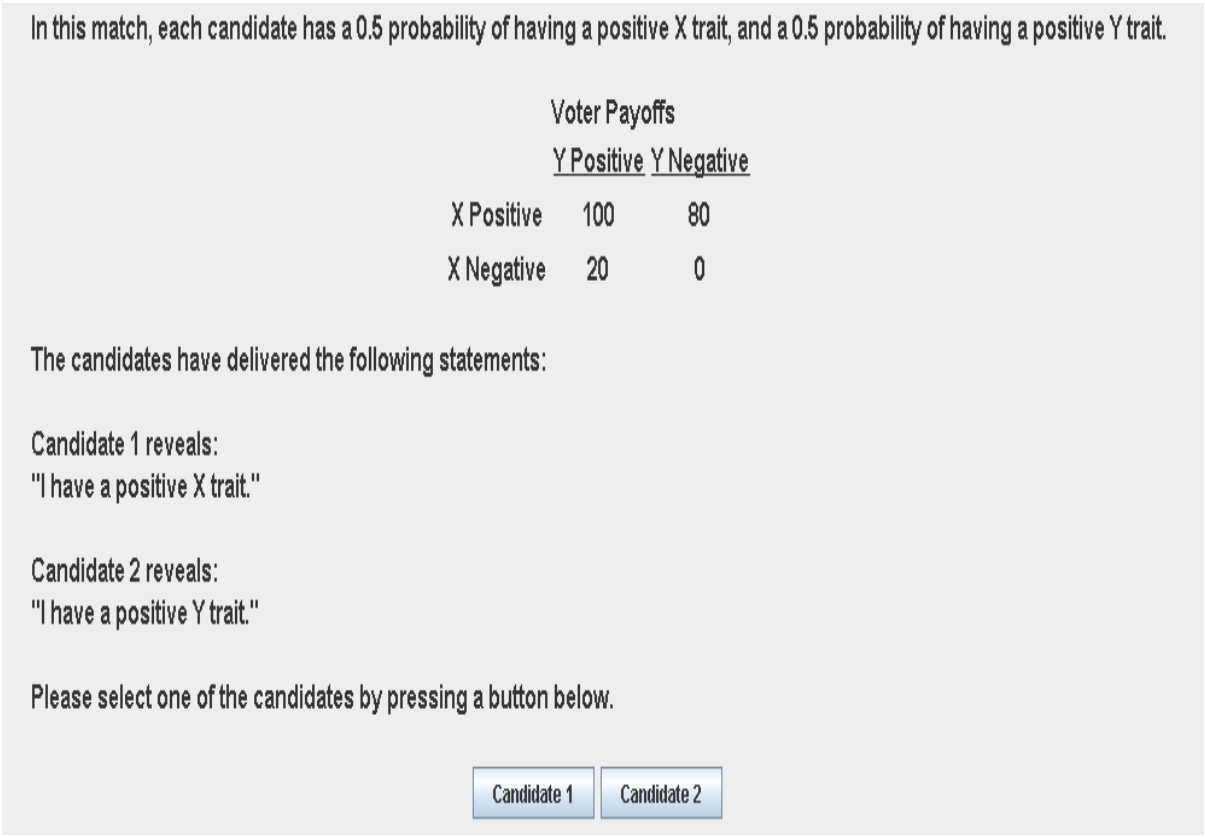

Figure 16: Example Screen for Players in the Voter Role

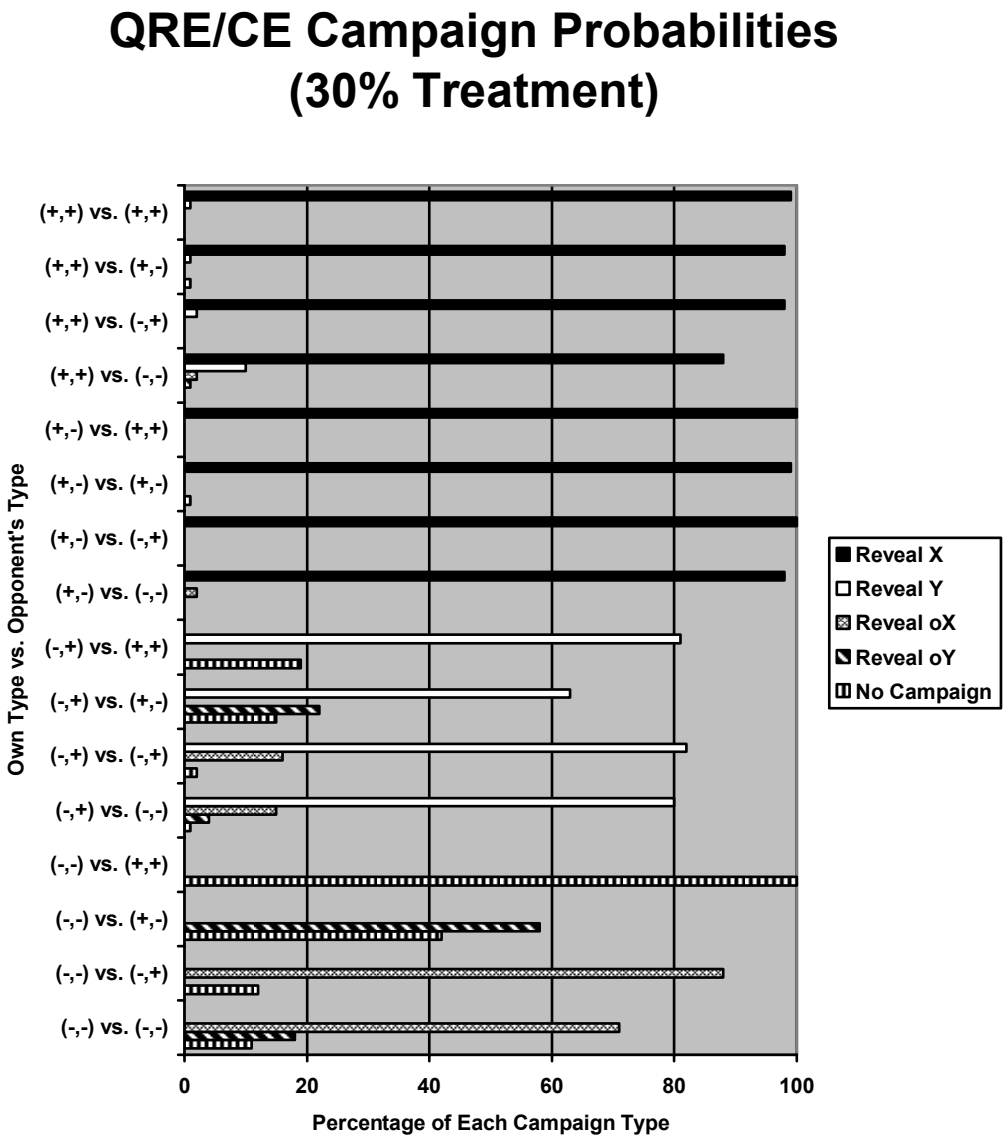

Figure 17: Campaign Probabilities at the QRE/CE Estimate of λ, χ, and q (30% Treatment)

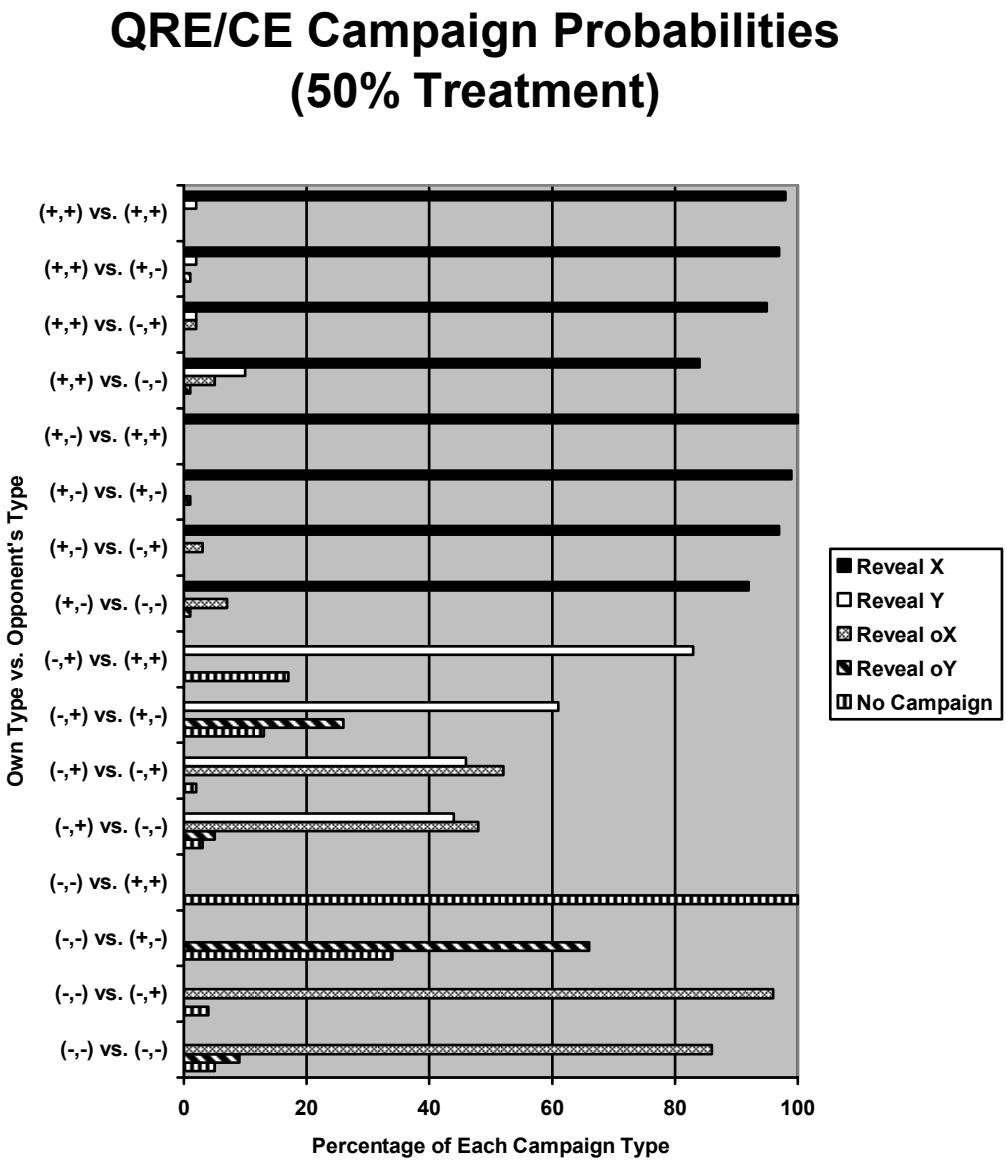

Figure 18: Campaign Probabilities at the QRE/CE Estimate of λ, χ, and q (50% Treatment)

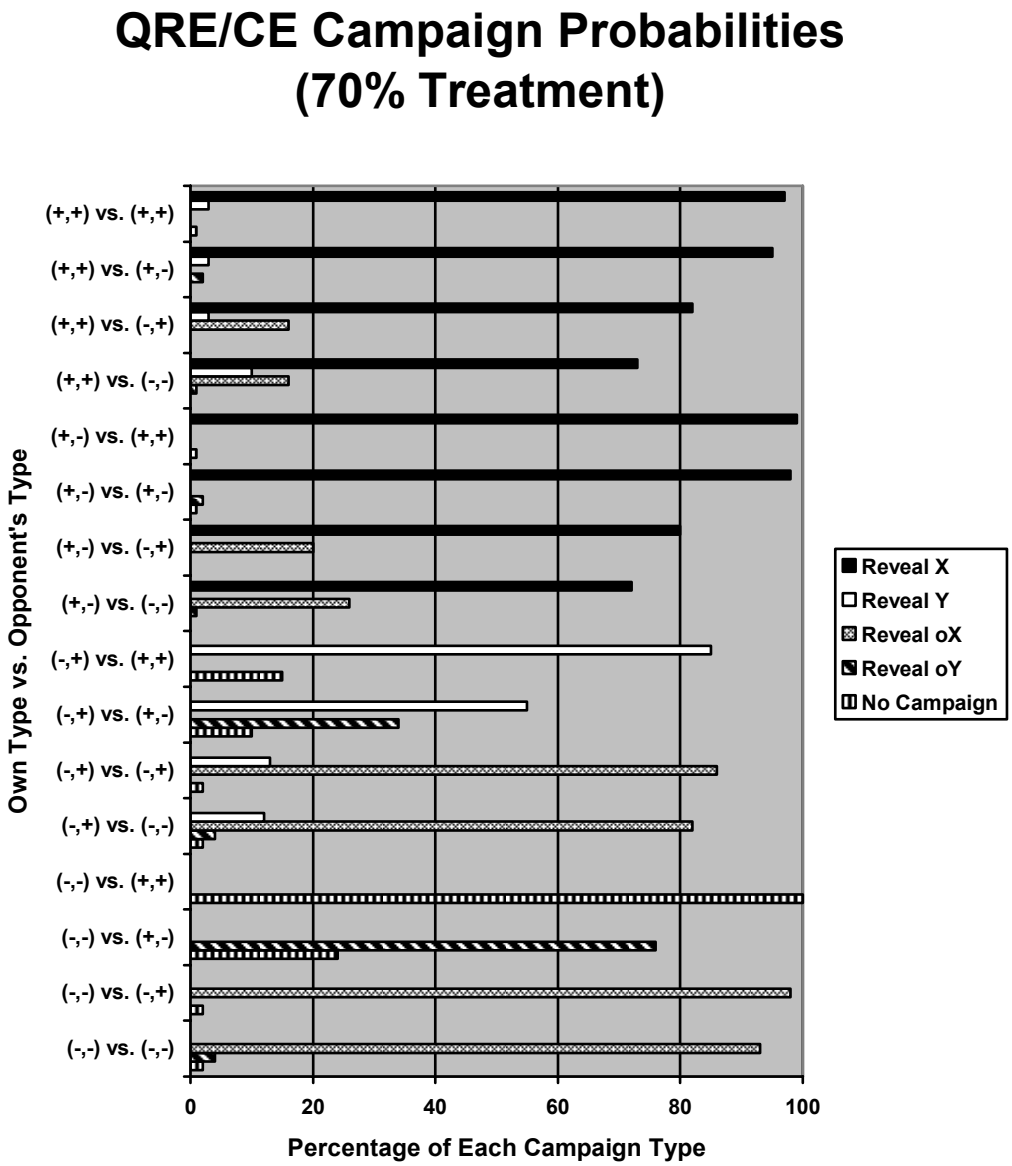

Figure 19: Campaign Probabilities at the QRE/CE Estimate of λ, χ, and q (70% Treatment)

Chapter 5 Appendix

Table 26: Factors Affecting Voter Preference Against Negativity (dependent variable: topic relevance)[104]

Independent Variable	Hypocrisy	Tax Evasion	Special Interests	Drug Abuse	Voting Record	Military Experience	Financial Problems
White	0.01(0.06)	-0.03(0.06)	-0.10(0.06)	-0.04(0.07)	0.01(0.06)	-0.08(0.08)	-0.20(0.08)
Female	-0.10(0.04)	-0.04(0.04)	-0.00(0.04)	0.02(0.04)	-0.08(0.04)	-0.03(0.05)	-0.12(0.05)
Age	-0.00(0.01)	0.03(0.01)	0.06(0.01)	0.04(0.02)	0.02(0.01)	0.05(0.02)	0.11(0.02)
Education	0.03(0.01)	-0.00(0.02)	-0.00(0.02)	-0.01(0.02)	0.04(0.01)	-0.01(0.02)	-0.00(0.02)
Party ID	0.01(0.01)	0.01(0.01)	0.03(0.01)	-0.00(0.01)	0.01(0.01)	-0.01(0.02)	-0.02(0.02)
Ideology	-0.05(0.02)	-0.05(0.03)	-0.02(0.03)	0.02(0.03)	-0.02(0.02)	0.06(0.03)	0.05(0.03)
GWB disapvl.	-0.05(0.02)	-0.06(0.02)	0.14(0.03)	-0.06(0.03)	-0.04(0.02)	0.10(0.03)	-0.05(0.03)
Constant	3.05(0.17)	2.88(0.18)	1.97(0.19)	2.61(0.20)	2.80(0.16)	1.12(0.24)	1.77(0.24)
N	772	771	773	770	772	769	770
R-squared	0.02	0.02	0.08	0.04	0.03	0.03	0.07

Table 27: Factors Affecting Voter Preference Against Negativity (dependent variable: topic relevance)

Independent Variable	Family Actions	Past Drug Use	Infidelity	Broken Promises	Political Conduct	Police Record	Felony Conviction
White	-0.18(0.07)	-0.20(0.08)	0.01(0.08)	-0.03(0.06)	-0.01(0.06)	-0.13(0.07)	-0.05(0.06)
Female	-0.00(0.04)	0.03(0.05)	-0.11(0.05)	-0.06(0.04)	-0.08(0.04)	0.06(0.05)	-0.07(0.04)
Age	0.08(0.02)	0.12(0.02)	0.05(0.02)	-0.00(0.01)	0.01(0.01)	0.07(0.02)	0.04(0.01)
Education	-0.01(0.02)	-0.03(0.02)	-0.00(0.02)	-0.00(0.02)	0.02(0.01)	0.01(0.02)	-0.01(0.02)
Party ID	-0.00(0.01)	0.01(0.02)	0.05(0.02)	0.02(0.01)	0.01(0.01)	0.02(0.02)	-0.00(0.01)
Ideology	-0.00(0.03)	0.07(0.03)	0.10(0.03)	-0.05(0.03)	-0.03(0.02)	0.01(0.03)	0.02(0.03)
GWB disapvl.	-0.05(0.03)	-0.01(0.03)	-0.17(0.03)	-0.02(0.03)	-0.06(0.02)	-0.05(0.03)	-0.04(0.03)
Constant	1.46(0.20)	1.50(0.25)	1.80(0.24)	2.81(0.19)	3.01(0.17)	2.28(0.21)	2.75(0.19)
N	769	774	771	769	773	773	773
R-squared	0.06	0.08	0.24	0.01	0.03	0.06	0.03

[104] The dependent variable, relevance of the particular topic, equaled 1 (very relevant), 2 (somewhat relevant), or 3 (not relevant).

Table 28: Factors Affecting Voter Preference Against Negativity (dependent variable: topic relevance)

Independent Variable	Voting Record	Infidelity	Police Record	Felony Conviction
White	0.01(0.06)	-0.04(0.09)	-0.16(0.08)	-0.06(0.07)
Female	-0.05(0.04)	-0.14(0.06)	0.09(0.05)	-0.04(0.05)
Age	0.03(0.01)	0.05(0.02)	0.08(0.02)	0.05(0.02)
Education	0.03(0.02)	0.01(0.02)	-0.01(0.02)	-0.01(0.02)
Party ID	0.01(0.01)	0.05(0.02)	0.02(0.02)	0.01(0.02)
Ideology	-0.03(0.02)	0.10(0.04)	-0.02(0.03)	-0.00(0.03)
GWB disapvl.	-0.04(0.02)	-0.16(0.03)	-0.06(0.03)	-0.04(0.03)
Income	0.01(0.01)	-0.02(0.01)	0.02(0.01)	0.01(0.01)
Constant	2.69(0.18)	2.00(0.27)	2.21(0.23)	2.61(0.21)
N	648	645	647	647
R-squared	0.04	0.24	0.08	0.04

Chapter 7 Appendix: Figures and Descriptions

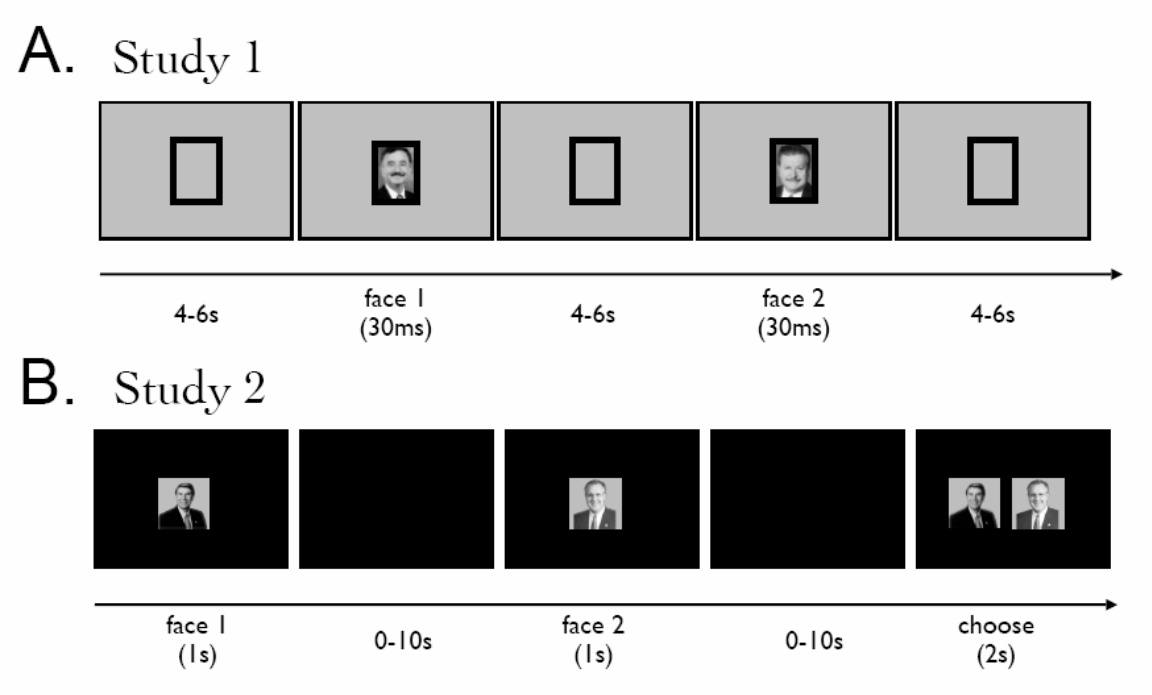

Figure 20: Trial design of the two studies

Each experiment showed subjects grayscale images of real politicians, one at a time, separated by a variable interstimulus interval. For both experiments, stimuli are depicted as they appeared on the screen.

A) Study 1: Social Judgment Study. Each trial consisted of two cycles of the alternating presentation of two images, separated by blank boxes that cued viewers to the subsequent location of the image. Participants were asked to indicate which of the two images looked more threatening, attractive, deceitful, or competent (in four separate blocks) by pushing one of two buttons (whose location was indicated by a small black dot in the lower corner of the screen). Images were shown for 30 ms (unmasked). We analyzed data only from the first cycle (shown in the figure) to ensure consistency with experiment 2.

B) Study 2: Simulated Voting Study. Participants were shown grayscale images of each of the candidates, separately, for 1 second each. The images were separated from each other and from the decision period by a 1–10 second black screen. Participants were asked to indicate with a button push which of the two they would vote for.

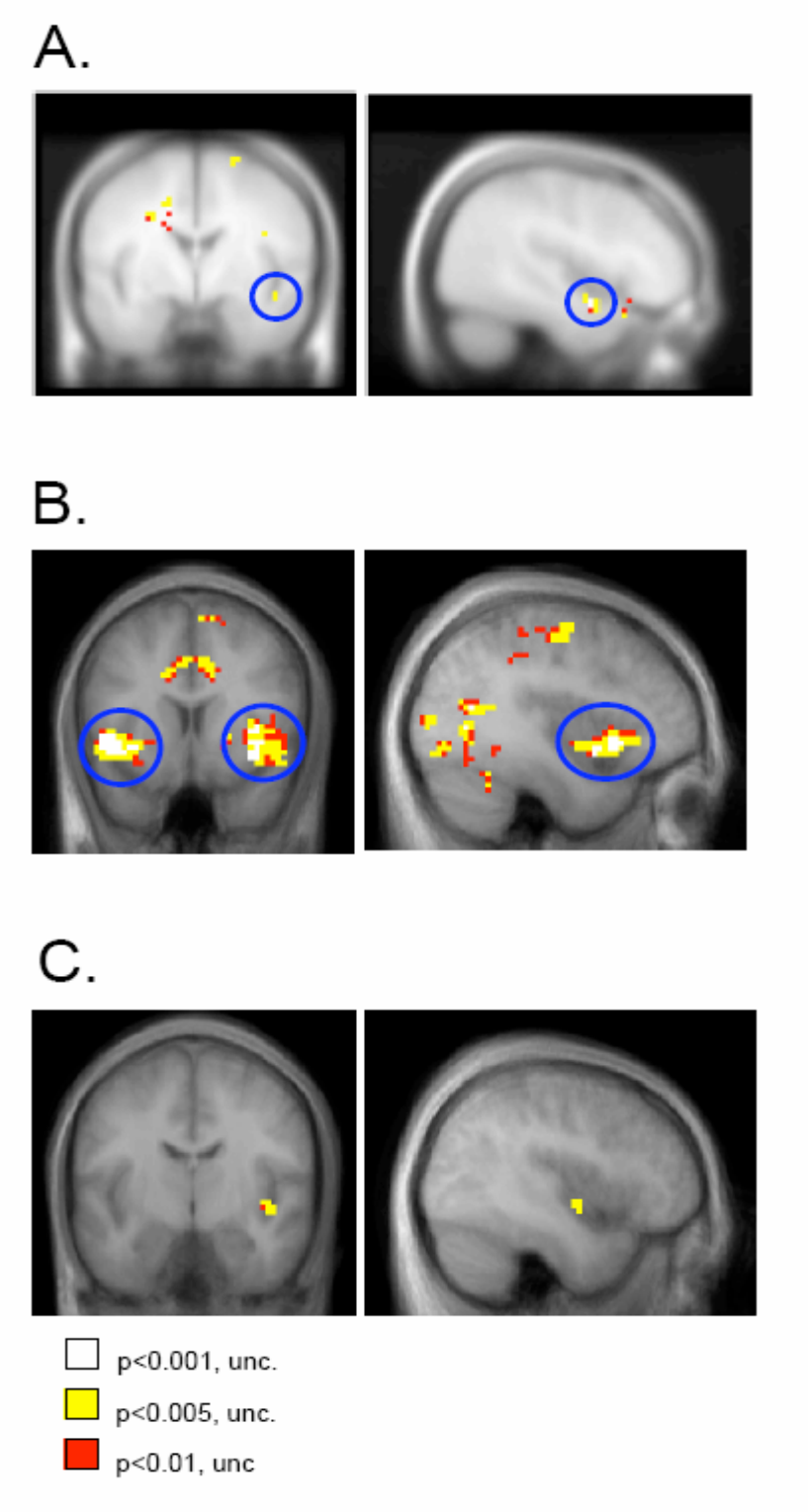

Figure 21: Activity in the insula/parainsula correlates with election loss in both studies.

A) Study 1: Activation during the threat judgment condition in the right parainsula (blue circle; [45, 0, -15]) was greater to images of candidates who lost than to those who won real elections.

B) Study 2: Activation during the simulated voting study in bilateral insula (blue circles; left insula [-45,12,9] and right insula [48,-3,-9]) was negatively correlated with lab-vote-share (i.e., greater for losers in the simulated election).

C) Study 2: Activation during the simulated voting study in the right insula (42,-6,-9) was also negatively correlated with real-vote-share (i.e., greater for losers in real elections).

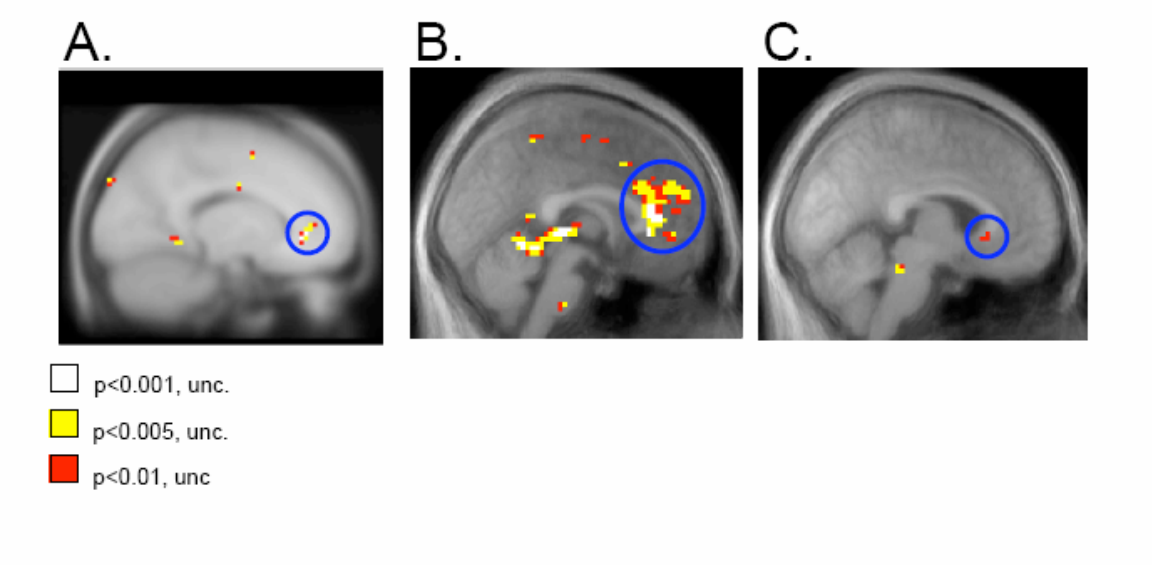

Figure 22: Activity in ventral anterior cingulate cortex correlates with election loss in both studies.

A) Study 1: Activation during the threat judgment condition in the right ventral anterior cingulated (blue circle; [15, 39, 0]) was greater to images of candidates who lost than to those who won real elections.

B) Study 2: Activation during the simulated voting study in bilateral anterior cingulated (blue circle; [3,33,9] and [-9, 21, 24]) was negatively correlated with lab-vote-share.

C) Study 2: Activation during the simulated voting study in the right ventral anterior cingulated (blue circle; [3,21,-6]) was negatively correlated with real-vote-share.

Chapter 8 Appendix

Variable Coding Details

With fear as the dependent variable:

Gender was coded 0 for female and 1 for male. Education was a coded in a four-point scale: grade school, high school, some college, and college degree. Age was broken up into three brackets, 18–34, 35–54, and 55+. The default race was White, with separate dummies included for Black, Hispanic, Asian, and Native American voters. The baseline religion was Protestant, with separate dummies included for Catholic, Jewish, and Other (the latter coded 1 if the respondent indicated anything different from the previous three choices; this was excluded from the tables presented as it was neither statistically significant nor easily interpretable). Higher values for the church attendance variable correspond to less frequent actual attendance.[105] The default region for the census region variables was the Midwest.[106] For party identification, both weak and strong party identifiers were included as party identifiers; the rest were considered independents. Extreme ideology respondents were those whose average individual placement on a number of specific issue questions was either below 2.5 or above 5.5 on a 7-point scale. Activists are defined as engaging in two or more of the six campaign activities asked in ANES, just as in one of the seminal works addressing this subject (Nie et al. 1976). Finally, retrospective assessments of the national economy were placed on a 5-point scale, with a response of 3 indicating that the economy was about the same this year as it was last year.[107] Higher values indicate a more negative assessment.

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[105] 1=every week, 2=almost every week, 3=once or twice a month, 4=a few times a year, 5=never

[106] The Midwest is coded as North Central in the ANES

[107] The question text was, "Would you say that over the past year the nation's economy has gotten better, stayed the same or gotten worse?" (IF BETTER) "Would you say much better or somewhat better?" (IF WORSE) "Would you say much worse or somewhat worse?"

With vote choice as the dependent variable:

In contrast to the aforementioned studies of Marcus et al. (1993, 2000, 2001) and Ladd and Lenz (2008) we focused our analysis on explaining reported vote choice rather than reported vote intent. Variables were coded as above with the following additions and exceptions. Each of the eight emotional affect variables from the ANES was coded dichotomously with 1 for yes answers and 0 for no. Ideology represents the difference between two differences: the average of the individual's self-placements and candidate placements on political issues, computed for both candidates. Candidate assessments were condensed into one statistic as in Marcus, Neuman, and MacKuen (2000), by normalizing the difference between the stated character-related likes and dislikes about each major party candidate. Thermometer difference scores are the normalized difference of the score for the Democrat and score for the Republican. For retrospective assessments of the national economy, higher values indicate a more pro-Democratic assessment—in other words, a positive assessment with an incumbent Democratic president or a negative assessment with an incumbent Republican. Dummy variables were created for each election year, with the baseline year as 1980.

Further Regressions on Fear and Vote Choice

(See endnotes for details)

Table 29: Determinants of Voter Fear[1]

Independent Variable	(1) Probit	(2) Probit SUR[2]	(3) Linear[3]	(4) Linear SUR[4]
Male	-0.01(0.03)	0.00(0.03)	0.00(0.01)	0.00(0.01)
Education	0.10(0.02)	0.09(0.02)	0.04(0.01)	0.04(0.01)
Black	-0.13(0.06)	-0.11(0.06)	-0.05(0.02)	-0.04(0.02)
Hispanic	-0.06(0.08)	-0.05(0.08)	-0.02(0.03)	-0.02(0.03)
Native American	0.08(0.10)	0.08(0.11)	0.03(0.04)	0.03(0.04)
Asian	-0.12(0.15)	-0.15(0.15)	-0.05(0.05)	-0.06(0.06)
Age 17–34	0.04(0.04)	0.02(0.04)	0.02(0.02)	0.01(0.02)
Age over 55	-0.12(0.04)	-0.13(0.04)	-0.04(0.01)	-0.05(0.01)
Catholic	-0.15(0.04)	-0.15(0.04)	-0.06(0.01)	-0.06(0.02)
Jewish	-0.01(0.10)	0.01(0.11)	0.00(0.04)	0.00(0.04)
Church Attendance	0.00(0.01)	0.00(0.01)	0.00(0.00)	0.00(0.00)
West Region	0.00(0.05)	0.00(0.05)	0.00(0.02)	0.00(0.02)
East Region	-0.01(0.05)	-0.02(0.05)	-0.01(0.02)	-0.01(0.02)
South Region	-0.03(0.04)	-0.03(0.04)	-0.01(0.02)	-0.01(0.02)
Democrat	-0.04(0.05)	-0.06(0.05)	-0.02(0.02)	-0.02(0.02)
Republican	-0.15(0.05)	-0.16(0.05)	-0.06(0.02)	-0.06(0.02)
Strong Party ID	0.10(0.04)	0.10(0.04)	0.04(0.01)	0.04(0.02)
Extreme Ideology	0.17(0.04)	0.16(0.04)	0.06(0.01)	0.06(0.01)
Political Interest	0.25(0.03)	0.25(0.03)	0.10(0.01)	0.10(0.01)
Activist	0.25(0.04)	0.25(0.04)	0.09(0.02)	0.09(0.02)
Economic Assessment	0.08(0.02)	0.09(0.02)	0.03(0.01)	0.03(0.01)
Year: 1984	-0.05(0.07)	-0.03(0.07)	-0.02(0.02)	-0.02(0.03)
Year: 1988	-0.19(0.07)	-0.18(0.07)	-0.07(0.02)	-0.07(0.03)
Year: 1992	0.19(0.06)	0.21(0.06)	0.07(0.02)	0.08(0.02)
Year: 1996	0.17(0.07)	0.19(0.07)	0.06(0.03)	0.07(0.03)
Year: 2000	-0.10(0.07)	-0.09(0.08)	-0.04(0.03)	-0.03(0.03)
Year: 2004	0.37(0.07)	0.38(0.07)	0.14(0.03)	0.14(0.03)
Constant	-1.17(0.13)	-1.16(0.13)	0.07(0.05)	0.07(0.05)
N	6524	6138	6524	6138
(Pseudo) R-squared	0.06	--	0.08	0.08
Rho (and std. error)	--	0.03(0.10)	--	--

Table 30: Determinants of Fearing the Democratic Candidate[5]

Independent Variable	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit SUR[6]	(6) Probit SUR[7]
Vote Choice	-0.59(0.07)	-0.47(0.07)	-0.95(0.06)	-0.78(0.06)	-0.79(0.06)	-0.48(0.07)
Fear (Republican)	0.60(0.05)	--	0.49(0.05)	--	--	--
Male	0.03(0.04)	0.02(0.04)	0.03(0.04)	0.02(0.04)	0.02(0.04)	0.02(0.04)
Education	0.00(0.02)	0.01(0.02)	-0.01(0.02)	0.01(0.02)	0.01(0.02)	0.02(0.02)
Black	-0.24(0.09)	-0.24(0.09)	-0.27(0.09)	-0.27(0.08)	-0.27(0.08)	-0.24(0.08)
Hispanic	0.21(0.10)	0.18(0.10)	0.21(0.10)	0.18(0.10)	0.19(0.10)	0.18(0.10)
Native American	-0.10(0.13)	-0.09(0.13)	-0.09(0.13)	-0.09(0.13)	-0.07(0.12)	-0.07(0.13)
Asian	0.06(0.18)	0.03(0.18)	0.04(0.18)	0.00(0.18)	0.01(0.18)	0.03(0.18)
Age 17–34	-0.06(0.05)	-0.04(0.05)	-0.08(0.05)	-0.06(0.05)	-0.07(0.05)	-0.05(0.05)
Age over 55	-0.01(0.05)	-0.04(0.05)	-0.04(0.05)	-0.06(0.05)	-0.06(0.05)	-0.04(0.05)
Catholic	-0.11(0.05)	-0.13(0.05)	-0.11(0.05)	-0.13(0.05)	-0.13(0.05)	-0.13(0.05)
Jewish	0.03(0.13)	0.03(0.13)	0.01(0.13)	0.01(0.13)	0.01(0.13)	0.03(0.13)
Church Attendance	-0.01(0.01)	-0.01(0.01)	-0.02(0.01)	-0.02(0.01)	-0.02(0.01)	-0.01(0.01)
West Region	0.00(0.06)	0.00(0.06)	0.00(0.06)	0.00(0.06)	0.00(0.06)	0.00(0.06)
East Region	-0.01(0.06)	-0.02(0.06)	0.01(0.06)	0.00(0.06)	0.00(0.06)	-0.02(0.06)
South Region	0.06(0.05)	0.04(0.05)	0.07(0.05)	0.04(0.05)	0.04(0.05)	0.04(0.05)
Democrat	-0.06(0.06)	-0.06(0.06)	-0.13(0.06)	-0.12(0.06)	-0.11(0.06)	-0.06(0.06)
Republican	-0.07(0.05)	-0.10(0.05)	0.00(0.05)	-0.04(0.05)	-0.04(0.05)	-0.10(0.05)
Policy Diff. (Dem.)	0.03(0.00)	0.03(0.00)	0.03(0.00)	0.03(0.00)	0.03(0.00)	0.03(0.00)
Political Interest	0.17(0.03)	0.17(0.03)	0.18(0.03)	0.19(0.03)	0.20(0.03)	0.18(0.03)
Activist	0.12(0.05)	0.13(0.05)	0.13(0.05)	0.14(0.05)	0.14(0.05)	0.13(0.05)
Economic Assessment	-0.10(0.02)	-0.09(0.02)	-0.13(0.02)	-0.11(0.02)	-0.11(0.02)	-0.09(0.02)
Year: 1984	-0.22(0.08)	-0.23(0.08)	0.06(0.08)	0.03(0.08)	0.04(0.08)	-0.22(0.08)
Year: 1988	0.29(0.09)	0.23(0.08)	0.40(0.08)	0.32(0.08)	0.33(0.08)	0.23(0.08)
Year: 1992	0.43(0.10)	0.46(0.10)	0.74(0.09)	0.73(0.09)	0.73(0.09)	0.45(0.10)
Year: 1996	0.54(0.09)	0.49(0.09)	0.64(0.08)	0.58(0.08)	0.58(0.08)	0.49(0.08)
Year: 2000	0.10(0.10)	0.07(0.10)	0.25(0.10)	0.20(0.10)	0.20(0.10)	0.07(0.10)
Year: 2004	0.02(0.09)	0.07(0.09)	0.30(0.09)	0.32(0.09)	0.33(0.09)	0.07(0.09)
Anger (Democrat)	0.59(0.04)	0.61(0.04)	0.67(0.04)	0.68(0.04)	0.67(0.04)	0.60(0.04)
Hope (Democrat)	-0.29(0.06)	-0.23(0.05)	--	--	--	-0.23(0.05)
Pride (Democrat)	-0.16(0.05)	-0.12(0.05)	--	--	--	-0.13(0.05)
Anger (Republican)	0.04(0.05)	0.14(0.05)	--	--	--	0.15(0.05)
Hope (Republican)	0.38(0.05)	0.35(0.05)	--	--	--	0.35(0.05)
Pride (Republican)	0.28(0.05)	0.24(0.05)	--	--	--	0.24(0.05)
Constant	-1.40(0.14)	-1.33(0.14)	-1.12(0.14)	-1.10(0.13)	-1.12(0.13)	-1.37(0.14)
N	6138	6138	6138	6138	6138	6138
(Pseudo) R-squared	0.26	0.24	0.24	0.23	--	--
Rho (and std. error)	--	--	--	--	0.29(0.03)	0.34(0.03)

Table 31: Determinants of Fearing the Democratic Candidate (continued)

Independent Variable	(1) Linear SUR[8]	(2) Linear SUR[9]	(3) Multivar. Probit[10]	(4) Multivar. Probit[11]	(5) Linear 2SLS[12]	(6) Linear 3SLS[13]
Vote Choice	-0.21(0.01)	-0.13(0.02)	-1.80(0.06)	-1.91(0.05)	-0.62(0.03)	-0.78(0.06)
Fear (Republican)	--	--	2.05(0.04)	1.98(0.04)	0.17(0.01)	0.42(0.07)
Male	0.01(0.01)	0.00(0.01)	0.06(0.03)	0.06(0.03)	0.00(0.01)	0.01(0.01)
Education	0.00(0.01)	0.00(0.01)	-0.05(0.02)	-0.06(0.02)	-0.01(0.01)	-0.02(0.01)
Black	-0.04(0.02)	-0.04(0.02)	0.13(0.06)	0.10(0.06)	0.03(0.02)	0.05(0.02)
Hispanic	0.05(0.02)	0.04(0.02)	0.16(0.08)	0.15(0.08)	0.07(0.03)	0.09(0.03)
Native American	-0.02(0.03)	-0.02(0.03)	-0.13(0.10)	-0.12(0.11)	-0.01(0.03)	-0.01(0.04)
Asian	0.01(0.05)	0.02(0.05)	0.10(0.13)	0.10(0.13)	0.02(0.05)	0.04(0.05)
Age 17–34	-0.02(0.01)	-0.01(0.01)	-0.04(0.05)	-0.04(0.05)	-0.01(0.01)	-0.01(0.01)
Age over 55	-0.01(0.01)	-0.01(0.01)	0.06(0.04)	0.04(0.04)	0.00(0.01)	0.01(0.01)
Catholic	-0.03(0.01)	-0.03(0.01)	0.02(0.04)	0.02(0.04)	-0.02(0.01)	-0.01(0.01)
Jewish	0.00(0.03)	0.00(0.03)	0.14(0.10)	0.13(0.10)	0.04(0.03)	0.05(0.03)
Church Attendance	-0.01(0.00)	-0.01(0.00)	0.00(0.01)	0.00(0.01)	0.00(0.00)	0.00(0.00)
West Region	0.00(0.01)	0.00(0.01)	0.00(0.05)	0.01(0.05)	0.00(0.02)	0.00(0.02)
East Region	0.00(0.02)	-0.01(0.01)	0.01(0.05)	0.02(0.05)	0.00(0.02)	0.01(0.02)
South Region	0.01(0.01)	0.01(0.01)	0.05(0.04)	0.06(0.04)	0.00(0.01)	0.01(0.01)
Democrat	-0.02(0.01)	-0.01(0.01)	0.17(0.05)	0.13(0.05)	0.08(0.02)	0.10(0.02)
Republican	0.00(0.01)	-0.02(0.01)	-0.12(0.05)	-0.09(0.05)	-0.09(0.02)	-0.10(0.02)
Policy Diff. (Dem.)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.00(0.00)
Political Interest	0.05(0.01)	0.05(0.01)	0.06(0.02)	0.05(0.02)	0.06(0.01)	0.05(0.01)
Activist	0.04(0.01)	0.04(0.01)	0.03(0.03)	0.03(0.03)	0.05(0.01)	0.03(0.01)
Economic Assessment	-0.03(0.01)	-0.02(0.01)	-0.03(0.02)	-0.05(0.02)	-0.01(0.01)	-0.01(0.01)
Year: 1984	0.02(0.02)	-0.04(0.02)	-0.05(0.08)	-0.04(0.08)	-0.02(0.02)	-0.02(0.02)
Year: 1988	0.09(0.02)	0.06(0.02)	0.31(0.08)	0.32(0.08)	0.08(0.02)	0.12(0.02)
Year: 1992	0.19(0.02)	0.12(0.02)	0.20(0.09)	0.26(0.09)	0.15(0.02)	0.14(0.03)
Year: 1996	0.15(0.02)	0.12(0.02)	0.54(0.08)	0.55(0.08)	0.18(0.02)	0.22(0.03)
Year: 2000	0.06(0.02)	0.03(0.02)	0.13(0.09)	0.16(0.09)	0.05(0.03)	0.07(0.03)
Year: 2004	0.09(0.02)	0.03(0.02)	-0.01(0.09)	0.00(0.09)	0.05(0.02)	0.02(0.03)
Anger (Democrat)	0.20(0.01)	0.18(0.01)	0.18(0.04)	0.14(0.02)	0.13(0.01)	0.11(0.02)
Hope (Democrat)	--	-0.06(0.01)	0.01(0.05)	--	--	--
Pride (Democrat)	--	-0.03(0.01)	-0.11(0.05)	--	--	--
Anger (Republican)	--	0.03(0.01)	-0.19(0.05)	--	--	--
Hope (Republican)	--	0.09(0.01)	0.09(0.05)	--	--	--
Pride (Republican)	--	0.06(0.01)	0.08(0.04)	--	--	--
Constant	0.15(0.03)	0.10(0.04)	-0.54(0.13)	-0.35(0.12)	0.25(0.04)	0.30(0.04)
N	6138	6138	6138	6138	6138	6138
Pseudo R-squared	0.24	0.26	--	--	0.17	0.05
Rho w/ Rep. fear (s.e.)	--	--	-0.98(.004)	-0.98(.004)	--	--
Rho w/ vote (s.e.)	--	--	-0.99(.004)	-0.99(.003)	--	--

Table 32: Determinants of Fearing the Democratic Candidate (continued)

Independent Variable	(1) Vote Instrum.[14]	(2) Vote Instrum.	(3) Bivar. probit[15]	(4) Bivar. probit	(5) Probit MLE[16]	(6) Two-stage probit[17]
Vote Choice (Instrumented)	-0.38(0.02)	-0.37(0.03)	-0.30(0.02)	-0.31(0.03)	-2.14(0.08)	-2.48(0.12)
Fear (Republican)	0.70(0.05)	0.67(0.05)	--	--	0.67(0.05)	0.78(0.06)
Male	0.03(0.04)	0.03(0.04)	0.01(0.04)	0.02(0.04)	0.01(0.04)	0.01(0.04)
Education	-0.01(0.02)	-0.02(0.02)	0.01(0.02)	0.01(0.02)	-0.02(0.02)	-0.02(0.03)
Black	0.09(0.09)	0.09(0.09)	0.03(0.09)	0.05(0.09)	0.03(0.08)	0.04(0.09)
Hispanic	0.25(0.10)	0.25(0.10)	0.21(0.10)	0.22(0.10)	0.26(0.09)	0.30(0.11)
Native American	0.00(0.13)	0.01(0.13)	0.01(0.13)	0.02(0.13)	-0.05(0.12)	-0.06(0.14)
Asian	0.09(0.18)	0.09(0.18)	0.03(0.18)	0.06(0.17)	0.06(0.17)	0.07(0.19)
Age 17–34	-0.07(0.05)	-0.07(0.05)	-0.05(0.05)	-0.06(0.05)	-0.04(0.05)	-0.04(0.05)
Age over 55	-0.03(0.05)	-0.02(0.05)	-0.06(0.05)	-0.05(0.05)	-0.03(0.04)	-0.04(0.05)
Catholic	-0.08(0.05)	-0.08(0.05)	-0.10(0.05)	-0.10(0.05)	-0.07(0.05)	-0.08(0.05)
Jewish	0.24(0.14)	0.24(0.14)	0.20(0.13)	0.20(0.13)	0.17(0.12)	0.19(0.14)
Church Attendance	0.02(0.01)	0.02(0.01)	0.01(0.01)	0.01(0.01)	0.01(0.01)	0.01(0.02)
West Region	-0.01(0.06)	-0.01(0.06)	-0.01(0.06)	-0.01(0.06)	0.01(0.05)	0.01(0.06)
East Region	0.01(0.06)	0.00(0.06)	0.00(0.06)	-0.01(0.06)	0.02(0.06)	0.02(0.07)
South Region	0.00(0.05)	0.00(0.05)	-0.02(0.05)	-0.02(0.05)	0.01(0.05)	0.02(0.06)
Democrat	0.15(0.06)	0.14(0.06)	0.11(0.06)	0.12(0.06)	0.24(0.06)	0.27(0.07)
Republican	-0.31(0.05)	-0.30(0.06)	-0.31(0.05)	-0.30(0.06)	-0.34(0.05)	-0.39(0.06)
Policy Diff. (Dem.)	0.01(0.01)	0.01(0.01)	0.01(0.00)	0.01(0.00)	0.02(0.00)	0.02(0.01)
Political Interest	0.17(0.03)	0.16(0.03)	0.19(0.03)	0.17(0.03)	0.18(0.03)	0.21(0.04)
Activist	0.08(0.05)	0.07(0.05)	0.11(0.05)	0.09(0.05)	0.15(0.05)	0.17(0.06)
Economic Assessment	-0.03(0.02)	-0.04(0.02)	-0.03(0.02)	-0.04(0.02)	-0.04(0.02)	-0.04(0.03)
Year: 1984	-0.14(0.08)	-0.21(0.08)	-0.15(0.08)	-0.22(0.08)	-0.11(0.07)	-0.13(0.09)
Year: 1988	0.31(0.08)	0.32(0.09)	0.22(0.08)	0.25(0.08)	0.29(0.08)	0.34(0.09)
Year: 1992	0.57(0.09)	0.53(0.10)	0.58(0.09)	0.54(0.10)	0.52(0.09)	0.61(0.10)
Year: 1996	0.68(0.09)	0.67(0.09)	0.60(0.08)	0.60(0.09)	0.64(0.08)	0.75(0.09)
Year: 2000	0.14(0.10)	0.14(0.10)	0.09(0.10)	0.11(0.10)	0.16(0.09)	0.19(0.11)
Year: 2004	0.09(0.09)	0.04(0.10)	0.15(0.09)	0.09(0.09)	0.10(0.08)	0.12(0.10)
Anger (Democrat)	0.43(0.05)	0.40(0.05)	0.44(0.04)	0.44(0.05)	0.35(0.05)	0.41(0.05)
Hope (Democrat)	--	0.00(0.06)	--	0.02(0.06)	--	--
Pride (Democrat)	--	0.03(0.06)	--	0.03(0.05)	--	--
Anger (Republican)	--	0.15(0.05)	--	0.25(0.05)	--	--
Hope (Republican)	--	0.15(0.06)	--	0.15(0.06)	--	--
Pride (Republican)	--	0.09(0.05)	--	0.07(0.05)	--	--
Constant	-1.80(0.14)	-1.90(0.15)	-1.62(0.14)	-1.76(0.14)	-0.62(0.13)	-0.73(0.15)
N	6138	6138	6138	6138	6138	6138
Pseudo R-squared	0.28	0.28	--	--	--	--
Rho (and std. error)	--	--	0.36(0.03)	0.37(0.03)	0.52(0.02)	--

Table 33: Determinants of Fearing the Republican Candidate[18]

Independent Variable	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit SUR[19]	(6) Probit SUR[20]
Vote Choice	0.52(0.07)	0.41(0.06)	0.79(0.06)	0.62(0.05)	0.63(0.05)	0.42(0.06)
Fear (Democrat)	0.57(0.05)	--	0.49(0.05)	--	--	--
Male	-0.04(0.04)	-0.04(0.04)	-0.06(0.04)	-0.06(0.04)	-0.05(0.04)	-0.04(0.04)
Education	0.12(0.02)	0.12(0.02)	0.12(0.02)	0.12(0.02)	0.12(0.02)	0.12(0.02)
Black	-0.06(0.06)	-0.06(0.06)	-0.04(0.06)	-0.06(0.06)	-0.06(0.06)	-0.07(0.06)
Hispanic	-0.17(0.09)	-0.13(0.09)	-0.17(0.09)	-0.14(0.09)	-0.15(0.09)	-0.14(0.09)
Native American	0.21(0.12)	0.20(0.12)	0.19(0.12)	0.18(0.12)	0.17(0.12)	0.20(0.12)
Asian	-0.19(0.18)	-0.17(0.18)	-0.16(0.18)	-0.15(0.18)	-0.16(0.18)	-0.18(0.17)
Age 17–34	0.07(0.05)	0.06(0.05)	0.08(0.05)	0.08(0.05)	0.08(0.05)	0.06(0.05)
Age over 55	-0.19(0.05)	-0.19(0.05)	-0.16(0.05)	-0.17(0.05)	-0.17(0.05)	-0.18(0.05)
Catholic	-0.10(0.05)	-0.11(0.05)	-0.09(0.05)	-0.11(0.05)	-0.11(0.05)	-0.11(0.05)
Jewish	-0.03(0.11)	-0.02(0.11)	-0.02(0.11)	-0.02(0.11)	-0.02(0.12)	-0.03(0.12)
Church Attendance	0.00(0.01)	0.00(0.01)	0.00(0.01)	-0.01(0.01)	-0.01(0.01)	0.00(0.01)
West Region	-0.02(0.06)	-0.02(0.06)	-0.02(0.06)	-0.02(0.06)	-0.02(0.06)	-0.02(0.06)
East Region	-0.04(0.06)	-0.05(0.06)	-0.06(0.06)	-0.06(0.06)	-0.06(0.06)	-0.05(0.06)
South Region	-0.14(0.05)	-0.14(0.05)	-0.14(0.05)	-0.13(0.05)	-0.13(0.05)	-0.13(0.05)
Democrat	0.00(0.05)	-0.01(0.05)	0.05(0.05)	0.03(0.05)	0.03(0.05)	-0.01(0.05)
Republican	-0.23(0.06)	-0.23(0.06)	-0.29(0.06)	-0.28(0.06)	-0.28(0.06)	-0.23(0.06)
Policy Diff. (Rep.)	0.02(0.00)	0.02(0.00)	0.03(0.00)	0.03(0.00)	0.03(0.00)	0.02(0.00)
Political Interest	0.06(0.03)	0.08(0.03)	0.07(0.03)	0.10(0.03)	0.10(0.03)	0.08(0.03)
Activist	0.05(0.05)	0.07(0.05)	0.06(0.05)	0.08(0.05)	0.09(0.05)	0.07(0.05)
Economic Assessment	0.03(0.02)	0.02(0.02)	0.06(0.02)	0.05(0.02)	0.04(0.02)	0.02(0.02)
Year: 1984	-0.06(0.08)	-0.09(0.08)	-0.31(0.08)	-0.34(0.08)	-0.33(0.08)	-0.08(0.08)
Year: 1988	-0.56(0.09)	-0.52(0.09)	-0.71(0.08)	-0.68(0.08)	-0.68(0.08)	-0.52(0.09)
Year: 1992	0.26(0.09)	0.30(0.09)	-0.04(0.09)	0.00(0.09)	0.01(0.09)	0.30(0.09)
Year: 1996	-0.35(0.09)	-0.27(0.08)	-0.47(0.08)	-0.39(0.08)	-0.40(0.08)	-0.28(0.08)
Year: 2000	-0.20(0.10)	-0.19(0.10)	-0.35(0.09)	-0.34(0.09)	-0.34(0.09)	-0.19(0.09)
Year: 2004	0.34(0.09)	0.34(0.09)	0.07(0.09)	0.08(0.09)	0.08(0.08)	0.34(0.09)
Anger (Democrat)	0.07(0.05)	0.16(0.05)	--	--	--	0.17(0.05)
Hope (Democrat)	0.33(0.05)	0.29(0.05)	--	--	--	0.28(0.05)
Pride (Democrat)	0.19(0.05)	0.17(0.05)	--	--	--	0.16(0.05)
Anger (Republican)	0.60(0.04)	0.60(0.04)	0.68(0.04)	0.69(0.04)	0.68(0.04)	0.60(0.04)
Hope (Republican)	-0.15(0.05)	-0.11(0.05)	--	--	--	-0.10(0.05)
Pride (Republican)	-0.25(0.05)	-0.21(0.05)	--	--	--	-0.21(0.05)
Constant	-1.81(0.14)	-1.67(0.14)	-1.85(0.13)	-1.63(0.13)	-1.64(0.13)	-1.67(0.14)
N	6138	6138	6138	6138	6138	6138
(Pseudo) R-squared	0.26	0.24	0.24	0.23	--	--
Rho (and std. error)	--	--	--	--	0.29(0.03)	0.34(0.03)

Table 34: Determinants of Fearing the Republican Candidate (continued)

Independent Variable	(1) Linear SUR[21]	(2) Linear SUR[22]	(3) Multivar. Probit[23]	(4) Multivar. Probit[24]	(5) Linear 2SLS[25]	(6) Linear 3SLS[26]
Vote Choice	0.18(0.01)	0.12(0.02)	1.63(0.06)	1.72(0.05)	0.54(0.03)	0.76(0.07)
Fear (Democrat)	--	--	2.00(0.04)	1.94(0.04)	0.17(0.01)	0.47(0.08)
Male	-0.02(0.01)	-0.01(0.01)	-0.09(0.04)	-0.09(0.04)	-0.01(0.01)	-0.01(0.01)
Education	0.04(0.01)	0.03(0.01)	0.08(0.02)	0.08(0.02)	0.04(0.01)	0.04(0.01)
Black	-0.02(0.02)	-0.02(0.02)	-0.12(0.06)	-0.11(0.07)	-0.07(0.02)	-0.08(0.02)
Hispanic	-0.04(0.02)	-0.04(0.02)	-0.15(0.07)	-0.14(0.08)	-0.07(0.03)	-0.09(0.03)
Native American	0.04(0.03)	0.05(0.03)	0.19(0.09)	0.18(0.11)	0.03(0.03)	0.03(0.04)
Asian	-0.04(0.05)	-0.05(0.05)	-0.13(0.13)	-0.12(0.13)	-0.05(0.05)	-0.06(0.05)
Age 17–34	0.02(0.01)	0.02(0.01)	0.02(0.05)	0.01(0.05)	0.02(0.01)	0.02(0.01)
Age over 55	-0.04(0.01)	-0.05(0.01)	-0.10(0.05)	-0.09(0.04)	-0.04(0.01)	-0.04(0.01)
Catholic	-0.03(0.01)	-0.03(0.01)	-0.05(0.05)	-0.06(0.05)	-0.03(0.01)	-0.03(0.01)
Jewish	0.00(0.03)	-0.01(0.03)	-0.08(0.10)	-0.08(0.10)	-0.04(0.03)	-0.05(0.04)
Church Attendance	0.00(0.00)	0.00(0.00)	0.00(0.01)	0.00(0.01)	0.00(0.00)	-0.01(0.00)
West Region	0.00(0.02)	0.00(0.01)	0.02(0.05)	0.00(0.05)	0.00(0.02)	0.00(0.02)
East Region	-0.02(0.02)	-0.01(0.02)	-0.01(0.05)	-0.02(0.06)	-0.02(0.02)	-0.02(0.02)
South Region	-0.04(0.01)	-0.04(0.01)	-0.05(0.05)	-0.05(0.05)	-0.03(0.01)	-0.03(0.01)
Democrat	0.01(0.01)	0.00(0.01)	-0.15(0.05)	-0.12(0.05)	-0.07(0.02)	-0.10(0.02)
Republican	-0.06(0.01)	-0.05(0.01)	0.02(0.06)	0.00(0.06)	0.02(0.02)	0.06(0.02)
Policy Diff. (Rep.)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.00(0.00)	0.00(0.00)
Political Interest	0.03(0.01)	0.03(0.01)	-0.01(0.02)	0.00(0.02)	0.02(0.01)	-0.01(0.01)
Activist	0.03(0.01)	0.03(0.01)	0.00(0.04)	0.00(0.03)	0.01(0.01)	0.02(0.01)
Economic Assessment	0.01(0.01)	0.01(0.01)	0.01(0.02)	0.03(0.02)	0.00(0.01)	0.00(0.01)
Year: 1984	-0.09(0.02)	-0.02(0.02)	0.00(0.08)	-0.01(0.08)	-0.05(0.02)	-0.02(0.02)
Year: 1988	-0.17(0.02)	-0.12(0.02)	-0.33(0.09)	-0.35(0.08)	-0.16(0.02)	-0.16(0.02)
Year: 1992	0.01(0.02)	0.08(0.03)	-0.04(0.10)	-0.08(0.10)	-0.01(0.02)	-0.04(0.03)
Year: 1996	-0.11(0.02)	-0.07(0.02)	-0.48(0.09)	-0.49(0.09)	-0.15(0.02)	-0.20(0.03)
Year: 2000	-0.09(0.02)	-0.05(0.03)	-0.13(0.09)	-0.16(0.09)	-0.09(0.03)	-0.09(0.03)
Year: 2004	0.03(0.02)	0.10(0.02)	0.05(0.10)	0.04(0.10)	0.05(0.02)	0.05(0.03)
Anger (Democrat)	--	0.04(0.01)	-0.07(0.04)	--	--	--
Hope (Democrat)	--	0.08(0.01)	0.01(0.05)	--	--	--
Pride (Democrat)	--	0.05(0.01)	0.11(0.05)	--	--	--
Anger (Republican)	0.22(0.01)	0.19(0.01)	0.31(0.05)	0.22(0.03)	0.17(0.01)	0.14(0.02)
Hope (Republican)	--	-0.03(0.01)	-0.09(0.05)	--	--	--
Pride (Republican)	--	-0.06(0.01)	-0.04(0.05)	--	--	--
Constant	-0.03(0.03)	-0.03(0.04)	-1.96(0.13)	-2.08(0.12)	-0.11(0.04)	-0.22(0.05)
N	6138	6138	6138	6138	6138	6138
Pseudo R-squared	0.26	0.27	--	--	0.21	0.06
Rho w/ Dem. fear (s.e.)	--	--	-0.98(.004)	-0.98(.004)	--	--
Rho w/ vote (s.e.)	--	--	0.98(.004)	0.98(.003)	--	--

Table 35: Determinants of Fearing the Republican Candidate (continued)

Independent Variable	(1) Vote Instrum.[27]	(2) Vote Instrum.	(3) Bivar. probit[28]	(4) Bivar. probit	(5) Probit MLE[29]	(6) Two-stage probit[30]
Vote Choice (Instrumented)	0.31(0.02)	0.31(0.02)	0.23(0.01)	0.25(0.02)	1.83(0.08)	2.00(0.11)
Fear (Democrat)	0.67(0.05)	0.64(0.05)	--	--	0.66(0.05)	0.73(0.06)
Male	-0.05(0.04)	-0.04(0.04)	-0.04(0.04)	-0.04(0.04)	-0.03(0.04)	-0.03(0.04)
Education	0.14(0.02)	0.13(0.02)	0.13(0.02)	0.13(0.02)	0.13(0.02)	0.14(0.02)
Black	-0.30(0.07)	-0.30(0.07)	-0.26(0.07)	-0.26(0.07)	-0.23(0.06)	-0.25(0.07)
Hispanic	-0.21(0.10)	-0.20(0.10)	-0.17(0.09)	-0.16(0.09)	-0.23(0.09)	-0.25(0.10)
Native American	0.09(0.12)	0.10(0.12)	0.10(0.12)	0.10(0.12)	0.12(0.12)	0.14(0.13)
Asian	-0.20(0.18)	-0.20(0.18)	-0.19(0.18)	-0.18(0.18)	-0.18(0.17)	-0.20(0.19)
Age 17–34	0.09(0.05)	0.08(0.05)	0.08(0.05)	0.07(0.05)	0.06(0.05)	0.07(0.05)
Age over 55	-0.19(0.05)	-0.18(0.05)	-0.19(0.05)	-0.18(0.05)	-0.16(0.05)	-0.18(0.05)
Catholic	-0.12(0.05)	-0.12(0.05)	-0.13(0.05)	-0.13(0.05)	-0.10(0.05)	-0.11(0.05)
Jewish	-0.18(0.11)	-0.19(0.11)	-0.14(0.12)	-0.16(0.12)	-0.13(0.11)	-0.14(0.12)
Church Attendance	-0.03(0.01)	-0.03(0.01)	-0.03(0.01)	-0.03(0.01)	-0.02(0.01)	-0.03(0.01)
West Region	-0.01(0.06)	-0.01(0.06)	-0.01(0.06)	-0.02(0.06)	-0.02(0.05)	-0.02(0.06)
East Region	-0.06(0.06)	-0.06(0.06)	-0.05(0.06)	-0.06(0.06)	-0.06(0.06)	-0.07(0.06)
South Region	-0.08(0.05)	-0.08(0.05)	-0.08(0.05)	-0.08(0.05)	-0.09(0.05)	-0.10(0.05)
Democrat	-0.18(0.05)	-0.18(0.05)	-0.15(0.05)	-0.16(0.05)	-0.25(0.05)	-0.27(0.06)
Republican	-0.06(0.06)	-0.06(0.06)	-0.11(0.06)	-0.09(0.06)	0.02(0.06)	0.02(0.07)
Policy Diff. (Rep.)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.02(0.00)
Political Interest	0.06(0.03)	0.05(0.03)	0.10(0.03)	0.08(0.03)	0.03(0.03)	0.03(0.03)
Activist	0.08(0.05)	0.07(0.05)	0.11(0.05)	0.09(0.05)	0.01(0.05)	0.01(0.06)
Economic Assessment	-0.01(0.02)	-0.01(0.02)	-0.01(0.02)	-0.02(0.02)	0.00(0.02)	0.00(0.02)
Year: 1984	-0.24(0.08)	-0.12(0.08)	-0.28(0.08)	-0.14(0.08)	-0.19(0.07)	-0.21(0.08)
Year: 1988	-0.66(0.09)	-0.58(0.09)	-0.64(0.08)	-0.53(0.09)	-0.61(0.08)	-0.68(0.09)
Year: 1992	-0.06(0.09)	0.08(0.10)	0.01(0.09)	0.16(0.10)	-0.04(0.08)	-0.04(0.09)
Year: 1996	-0.51(0.08)	-0.46(0.09)	-0.40(0.08)	-0.37(0.08)	-0.51(0.08)	-0.57(0.09)
Year: 2000	-0.32(0.10)	-0.24(0.10)	-0.32(0.09)	-0.22(0.09)	-0.33(0.09)	-0.36(0.10)
Year: 2004	0.15(0.09)	0.28(0.09)	0.15(0.09)	0.29(0.09)	0.13(0.08)	0.14(0.09)
Anger (Democrat)	--	0.22(0.05)	--	0.29(0.05)	--	--
Hope (Democrat)	--	0.09(0.06)	--	0.09(0.06)	--	--
Pride (Democrat)	--	0.03(0.05)	--	0.04(0.05)	--	--
Anger (Republican)	0.54(0.04)	0.50(0.04)	0.54(0.04)	0.52(0.04)	0.47(0.04)	0.52(0.05)
Hope (Republican)	--	0.03(0.05)	--	0.05(0.05)	--	--
Pride (Republican)	--	-0.09(0.05)	--	-0.08(0.05)	--	--
Constant	-1.05(0.14)	-1.19(0.14)	-0.97(0.13)	-1.15(0.14)	-1.85(0.13)	-2.04(0.14)
N	6138	6138	6138	6138	6138	6138
Pseudo R-squared	0.26	0.27	--	--	--	--
Rho (and std. error)	--	--	0.36(0.03)	0.37(0.03)	-0.43(0.03)	--

Table 36: Determinants of Vote Choice[31]

Independent Variable	(1) Probit	(2) Probit SUR[32]	(3) Linear	(4) Linear SUR[33]	(5) Multivar. Probit[34]	(6) Multivar. Probit[35]
Fear (Democrat)	-0.29(0.08)	-0.31(0.12)	-0.03(0.01)	-0.03(0.01)	-1.88(0.04)	-1.91(0.04)
Fear (Republican)	0.26(0.07)	0.22(0.14)	0.04(0.01)	0.04(0.01)	1.70(0.05)	1.73(0.05)
Male	0.00(0.06)	0.00(0.06)	0.00(0.01)	0.00(0.01)	0.09(0.04)	0.09(0.04)
Education	-0.07(0.04)	-0.07(0.04)	-0.01(0.00)	-0.01(0.00)	-0.06(0.03)	-0.06(0.03)
Black	0.91(0.12)	0.91(0.15)	0.12(0.01)	0.12(0.01)	0.34(0.08)	0.31(0.08)
Hispanic	0.25(0.13)	0.26(0.15)	0.05(0.02)	0.05(0.02)	0.20(0.11)	0.13(0.12)
Native American	0.41(0.21)	0.41(0.21)	0.05(0.02)	0.05(0.02)	-0.07(0.11)	-0.04(0.11)
Asian	0.00(0.24)	0.00(0.16)	-0.01(0.03)	-0.01(0.03)	-0.08(0.10)	-0.10(0.11)
Age 17–34	-0.02(0.07)	-0.02(0.07)	0.00(0.01)	0.01(0.01)	0.01(0.06)	0.01(0.06)
Age over 55	-0.03(0.07)	-0.03(0.07)	0.00(0.01)	0.00(0.01)	0.07(0.05)	0.07(0.05)
Catholic	0.07(0.07)	0.07(0.07)	0.01(0.01)	0.01(0.01)	0.04(0.05)	0.05(0.05)
Jewish	0.53(0.20)	0.53(0.16)	0.06(0.02)	0.06(0.02)	0.21(0.10)	0.18(0.09)
Church Attendance	0.07(0.02)	0.07(0.02)	0.01(0.00)	0.01(0.00)	0.02(0.02)	0.02(0.02)
West Region	-0.03(0.09)	-0.02(0.09)	0.00(0.01)	0.00(0.01)	0.06(0.06)	0.08(0.05)
East Region	0.13(0.09)	0.13(0.09)	0.02(0.01)	0.02(0.01)	0.11(0.06)	0.11(0.06)
South Region	-0.11(0.08)	-0.12(0.08)	-0.01(0.01)	-0.01(0.01)	0.02(0.05)	0.02(0.05)
Democrat	0.49(0.07)	0.49(0.07)	0.13(0.01)	0.13(0.01)	0.27(0.05)	0.20(0.05)
Republican	-0.47(0.08)	-0.47(0.08)	-0.11(0.01)	-0.11(0.01)	-0.19(0.06)	-0.19(0.06)
Ideology	0.19(0.04)	0.19(0.04)	0.01(0.00)	0.01(0.00)	0.00(0.02)	-0.02(0.02)
Candidate Evaluation	0.04(0.02)	0.04(0.02)	0.01(0.00)	0.01(0.00)	0.04(0.02)	0.02(0.02)
Feeling Thermometer	0.03(0.00)	0.03(0.00)	0.00(0.00)	0.00(0.00)	0.03(0.01)	0.03(0.01)
Economic Assessment	0.07(0.03)	0.07(0.04)	0.01(0.00)	0.01(0.00)	0.01(0.00)	0.01(0.00)
Year: 1984	0.21(0.12)	0.21(0.12)	0.05(0.01)	0.05(0.01)	0.02(0.10)	0.01(0.10)
Year: 1988	0.37(0.12)	0.37(0.12)	0.07(0.02)	0.07(0.02)	0.31(0.10)	0.31(0.09)
Year: 1992	0.71(0.15)	0.73(0.15)	0.12(0.02)	0.12(0.02)	0.27(0.12)	0.27(0.11)
Year: 1996	0.67(0.13)	0.67(0.12)	0.13(0.02)	0.13(0.02)	0.51(0.11)	0.50(0.10)
Year: 2000	0.39(0.14)	0.39(0.13)	0.08(0.02)	0.08(0.02)	0.14(0.11)	0.14(0.10)
Year: 2004	0.37(0.15)	0.37(0.17)	0.09(0.02)	0.09(0.02)	0.06(0.13)	0.04(0.11)
Anger (Democrat)	-0.21(0.07)	-0.21(0.07)	-0.04(0.01)	-0.04(0.01)	0.03(0.04)	0.00(0.03)
Hope (Democrat)	0.40(0.07)	0.40(0.07)	0.14(0.01)	0.14(0.01)	0.14(0.06)	0.12(0.04)
Pride (Democrat)	0.16(0.07)	0.16(0.07)	0.01(0.01)	0.01(0.01)	-0.03(0.06)	0.04(0.04)
Anger (Republican)	0.03(0.07)	0.03(0.07)	0.02(0.01)	0.02(0.01)	-0.15(0.05)	-0.08(0.04)
Hope (Republican)	-0.30(0.07)	-0.30(0.07)	-0.10(0.01)	-0.10(0.01)	-0.02(0.05)	-0.06(0.03)
Pride (Republican)	-0.16(0.07)	-0.15(0.07)	-0.04(0.01)	-0.04(0.01)	-0.02(0.05)	-0.06(0.03)
Constant	-1.71(0.26)	-1.70(0.26)	0.32(0.03)	0.32(0.03)	-0.42(0.19)	-0.24(0.17)
N	6144	6138	6144	6138	6138	6138
(Pseudo) R-squared	0.73	--	0.70	.070	--	--
Rho (and std. error)	--	0.03(0.10)	--	--	-0.98(.004)	-0.98(.003)

Table 37: Determinants of Vote Choice

Independent Variable	(1) Fear Instrum.[36]	(2) Fear Instrum.	(3) Linear 2SLS[37]	(4) Linear 3SLS[38]
Fear (Democrat) (Instrumented)	0.91(1.25)	1.34(0.84)	-0.07(0.45)	0.35(0.42)
Fear (Republican) (Instrumented)	-0.47(1.47)	-1.06(1.17)	0.69(0.62)	-0.08(0.54)
Male	-0.08(0.16)	-0.09(0.09)	0.00(0.02)	-0.01(0.02)
Education	-0.02(0.16)	0.02(0.12)	-0.03(0.02)	-0.01(0.02)
Black	1.33(0.66)	1.31(0.28)	0.12(0.02)	0.13(0.02)
Hispanic	0.05(0.36)	-0.11(0.30)	0.07(0.04)	0.04(0.04)
Native American	0.61(0.44)	0.77(0.37)	0.01(0.05)	0.06(0.05)
Asian	-0.06(0.30)	-0.22(0.33)	0.03(0.06)	-0.02(0.06)
Age 17–34	0.13(0.26)	0.14(0.14)	-0.01(0.02)	0.01(0.02)
Age over 55	-0.07(0.18)	-0.21(0.21)	0.02(0.03)	-0.01(0.03)
Catholic	0.17(0.09)	0.16(0.08)	0.03(0.01)	0.02(0.01)
Jewish	0.63(0.27)	0.55(0.20)	0.07(0.03)	0.06(0.03)
Church Attendance	0.11(0.06)	0.11(0.03)	0.01(0.00)	0.01(0.00)
West Region	-0.02(0.09)	-0.04(0.09)	0.01(0.01)	0.00(0.01)
East Region	0.11(0.12)	0.13(0.09)	0.03(0.01)	0.03(0.01)
South Region	-0.27(0.34)	-0.34(0.22)	0.01(0.03)	-0.01(0.02)
Democrat	0.91(0.75)	0.75(0.20)	0.13(0.01)	0.12(0.01)
Republican	-0.84(0.90)	-0.76(0.35)	-0.09(0.02)	-0.10(0.02)
Ideology	0.33(0.30)	0.40(0.18)	-0.01(0.02)	0.03(0.02)
Candidate Evaluation	0.05(0.02)	0.05(0.02)	0.01(0.01)	0.01(0.01)
Feeling Thermometer	0.03(0.00)	0.03(0.00)	0.00(0.00)	0.01(0.00)
Economic Assessment	0.26(0.34)	0.24(0.13)	0.00(0.01)	0.01(0.01)
Year: 1984	-0.05(0.74)	0.51(0.19)	0.06(0.03)	0.07(0.03)
Year: 1988	-0.35(1.50)	-0.49(0.77)	0.13(0.08)	0.05(0.07)
Year: 1992	0.02(1.02)	0.56(0.17)	0.07(0.03)	0.11(0.03)
Year: 1996	-0.01(1.16)	-0.18(0.63)	0.17(0.08)	0.09(0.07)
Year: 2000	0.01(0.80)	0.16(0.26)	0.10(0.03)	0.08(0.03)
Year: 2004	0.05(0.45)	0.73(0.44)	0.01(0.08)	0.10(0.07)
Anger (Democrat)	-0.98(1.01)	-1.00(0.43)	-0.08(0.04)	-0.08(0.04)
Hope (Democrat)	0.42(0.07)	1.27(0.72)	0.10(0.05)	0.13(0.04)
Pride (Democrat)	0.16(0.07)	0.59(0.37)	0.00(0.02)	0.02(0.01)
Anger (Republican)	0.39(1.13)	0.56(0.66)	-0.10(0.08)	0.01(0.07)
Hope (Republican)	-0.32(0.07)	-1.09(0.58)	-0.09(0.04)	-0.09(0.03)
Pride (Republican)	-0.17(0.07)	-0.84(0.55)	-0.02(0.03)	-0.06(0.03)
Constant	-2.34(2.33)	-2.74(1.55)	0.32(0.10)	0.19(0.09)
N	6138	6138	6138	6138
Pseudo R-squared	0.73	0.73	0.45	0.62
Rho w/ Dem. fear (s.e.)	--	--	--	--
Rho w/ Rep. fear (s.e.)	--	--	--	--

Endnotes for the Chapter 8 Appendix

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[1] The dependent variable is the ANES measure of voter fear. This is coded "1" if the voter expressed fear of either (or both) candidates, and "0" if the voter expressed fear of neither.
[2] Probit SUR with vote choice (Table 36, column 2)
[3] Linear regression, thus treating the dependent variable (fear) as continuous
[4] Linear SUR with vote choice (Table 36, column 4)
[5] The dependent variable for this and the following two tables captures whether the respondent expressed fear of the Democratic presidential candidate.
[6] Probit SUR with fear of the Republican candidate (Table 33, column 5)
[7] Probit SUR with fear of the Republican candidate (Table 33, column 6)
[8] Linear SUR with fear of the Republican (Table 34, column 1)
[9] Linear SUR with fear of the Republican (Table 34, column 2)
[10] Fear of the Democrat, the Republican (Table 34, column 3), and vote choice (Table 36, column 5) were regressed using multivariate probit, which estimates the three equations simultaneously as a multivariate normal distribution, assuming some covariance among the three equations. For each equation, the other two dependent variables were included on the RHS. The multivariate normal probabilities were computed using the GHK simulator (see Greene 2003 for further references to the literature).
[11] With fear of the Democrat, the Republican (Table 34, column 4), and vote choice (Table 36, column 6)
[12] Vote choice (assumed linear) was instrumented using all exogenous variables; that instrument was used as part of a linear regression on fear of the Democrat.
[13] Three-stage least squares regression with three simultaneous equations which were identical to those described for column (3); results for the other two endogenous variables can be found in Table 34, column 6, and Table 37, column 4.
[14] Here and in column 2, vote choice was instrumented via probit using all exogenous variables, and the fitted values were used in the fear regression.
[15] Here and in column 4, vote choice was instrumented via probit using all exogenous variables, then the fitted values were used in a bivariate probit regression on both candidate-specific fear variables; see also Table 35, columns 3 and 4.
[16] Computed using Stata's ivprobit method, estimating (via maximum likelihood) an instrument for vote choice simultaneously with probit for fear of the Democrat that included vote choice and fear of the Republican among the regressors.
[17] Two-stage regression using Newey's (1987) minimum chi-squared estimator, assuming vote choice to be linear in stage one and a probit model for the fear regression.
[18] The dependent variable for this and the following two tables captures whether the respondent expressed fear of the Republican Presidential candidate.
[19] Probit SUR with fear of the Democratic candidate (Table 30, column 5)
[20] Probit SUR with fear of the Democratic candidate (Table 30, column 6)
[21] Linear SUR with fear of the Democrat (Table 31, column 1)
[22] Linear SUR with fear of the Democrat (Table 31, column 2)
[23] Multivariate probit with fear of the Democrat (Table 31, column 3) and vote choice (Table 36, column 5); see endnote 10.
[24] With fear of the Democrat, the Republican (Table 31, column 4), and vote choice (Table 36, column 6)
[25] Vote choice (assumed linear) was instrumented using all exogenous variables; that instrument was used as part of a linear regression on fear of the Republican.
[26] With fear of the Democrat (Table 31, column 6) and vote choice (Table 37, column 4); see endnote 13.
[27] Here and in column 2, vote choice was instrumented via probit using all exogenous variables, and the fitted values were used in the fear regression.
[28] Here and in column 4, vote choice was instrumented via probit using all exogenous variables, then the fitted values were used in a bivariate probit regression on both candidate-specific fear variables; see also Table 32, columns 3 and 4.

[29] Computed using Stata's ivprobit method, estimating (via maximum likelihood) an instrument for vote choice simultaneously with probit for fear of the Republican that included vote choice and fear of the Democrat among the regressors.
[30] Two-stage regression using Newey's (1987) minimum chi-squared estimator, assuming vote choice to be linear in stage one and a probit model for the fear regression.
[31] The dependent variable indicates whether the respondent voted for the Democratic ("1") or Republican ("0") candidate. Thus positive coefficients suggest a greater likelihood of voting for the Democrat.
[32] See Table 29, column 2.
[33] See Table 29, column 4.
[34] Multivariate probit with fear of the Democrat (Table 31, column 3) and fear of the Republican (Table 34, column 3); see endnote 10.
[35] With fear of the Democrat (Table 31, column 4) and fear of the Republican (Table 34, column 4)
[36] Here and in column 2, both fear variables were instrumented via bivariate probit using all exogenous variables (though column 1 excluded the pride and hope variables; rho for column 1 = .20 and rho for column 2 = .31 with both p-values = 0.00), then the fitted values were used in a probit regression on both vote choice.
[37] Fear variables for each candidate (assumed linear) were instrumented simultaneously using all exogenous variables; those instruments were used as part of a linear regression on vote choice.
[38] With fear of the Democrat (Table 31, column 6) and fear of the Republican (Table 34, column 6); see endnote 13.

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