FACIAL SIMILARITY BETWEEN VOTERS AND CANDIDATES CAUSES INFLUENCE

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Abstract   Social science research demonstrates that people are drawn to others perceived as similar. We extend this finding to political candidates by comparing the relative effects of candidate familiarity as well as partisan, issue, gender, and facial similarity on voters' evaluations of candidates. In Experiment 1, during the week of the 2006 Florida gubernatorial race, a national representative sample of voters viewed images of two unfamiliar candidates (Crist and Davis) morphed with either themselves or other voters. Results demonstrated a strong preference for facially similar candidates, despite no conscious awareness of the similarity manipulation. In Experiment 2, one week before the 2004 presidential election, a national representative sample of voters evaluated familiar candidates (Bush and Kerry). Strong partisans were unmoved by the facial similarity manipulation, but weak partisans and independents preferred the candidate with whom their own face had been morphed over the candidate morphed with another voter. In Experiment 3, we compared the effects of policy similarity and facial similarity using a set of prospective 2008 presidential candidates. Even though the effects of party and policy similarity dominated, facial similarity proved a significant cue for unfamiliar candidates. Thus, the evidence across the three studies suggests that even in high-profile elections, voters prefer candidates high in facial similarity, but most strongly with unfamiliar candidates.

Introduction

Voters identify with political candidates in many ways, including agreeing with their positions on issues, holding the same party affiliation, belonging to the same social categories such as race or gender, or even having common physical traits such as height and facial appearance. An extensive literature across the social sciences demonstrates that people are often drawn to others perceived as similar (see Baumeister 1998 for a review). In the current work, we examined the relative effects of different forms of similarity on candidate evaluations by using an experimental design that manipulated the degree of candidate–voter facial similarity. We were particularly interested in how facial similarity compares to other forms of similarity such as partisanship or policy agreement and with other nonverbal cues including gender and candidate familiarity.

COGNITIVE AND NONVERBAL BASES OF CANDIDATE EVALUATIONS

Political scientists typically focus on candidates' policy positions, performance records, and party affiliation as the fundamental determinants of voter preferences (see Mutz, Brody, and Sniderman 1996 for a review). With a few notable exceptions (e.g., Rosenberg et al. 1986; Sullivan and Masters 1988; Masters 1991; Way and Masters 1996), nonverbal cues are conspicuously absent from the list of "usual suspects." The cognitive paradigm so dominates voting studies that even when researchers detect the effects of similarity based on a candidate's physical traits (most notably, race and gender), they typically attribute the propensity to support same-gender or ethnicity candidates to voters' tendency to infer agreeable policy positions from these traits (Granberg 1985; McDermott 1988; Iyengar et al. 1997; Koch 2000).

Other studies have, however, documented direct effects of nonverbal cues on candidate evaluations. In one widely cited example, Richard Nixon's unattractive appearance in the first televised debate of the 1960 campaign is widely believed to have strengthened JFK's candidacy. People who listened to the debate on the radio thought Nixon had won, while those who watched on television preferred Kennedy (Jamieson and Birdsell 1988; Kraus 1988; Druckman 2003). Similarly, with other factors held constant, more attractive candidates are preferred over less attractive ones (Sigelman, Sigleman, and Fowler 1987) and changes in facial expressions cause shifts in voting preferences (Rosenberg and McCafferty 1987). More recently, ratings of the candidates' competence based solely on their facial appearance predicted the outcome of congressional elections at better than chance levels (Todorov et al. 2005; Willis and Todorov 2006). To date, however, researchers have failed to isolate the particular facial features that enhance a candidate's appeal.

There is an abundance of evidence demonstrating that faces can and do influence how we judge others. The ability to recognize faces is well developed in humans (see Nelson 2001 for a review), even among the very young

(Fagan 1972), and facial stimuli are processed by specialized areas of the human brain (Phelps et al. 2000; Golby et al. 2001; Lieberman et al. 2005; Kanwisher and Yovel 2006). Facial displays are the principal means of conveying affect (Zajonc and Markus 1984; Ekman 1992), and affective arousal is known to precede and guide cognitive processing (Zajonc 1980). In the political world, imagery and messages that elicit emotional responses—including facial displays—boost attentiveness to the campaign (Marcus, Neuman, and MacKuen 2000) and shape voters' evaluations of the candidates (Masters and Sullivan 1993; Marcus, Neuman, and MacKuen 2000).

SIMILARITY AND FAMILIARITY AS RELATED FACIAL CUES

Several lines of argument converge on facial similarity as a likely criterion for choosing between candidates. First, frequency of exposure to any object—including human faces—induces a preference for that object over other, less familiar objects (Zajonc 1968, 1980, 2001). This "mere exposure" phenomenon also extends to objects similar to those previously encountered (Monahan, Murphy, and Zajonc 2000). People are more likely to agree with arguments made by a familiar candidate than a novel one—even when familiarity is manipulated beyond conscious recognition (Bornstein, Leone, and Galley 1987; Weisbuch, Mackie, and Garcia-Marques 2003). For obvious reasons, people are especially familiar with their own faces. Thus, facial similarity should work to benefit the "target" candidate via familiarity.

A second line of reasoning in social psychology points to similarity-based attraction, but independent of familiarity. Incidental similarities—for example, two people having the same birth date—increase the likelihood of prosocial and helping behaviors (Burger et al. 2004). People are also more likely to express willingness to help a hypothetical person with similar attitudes (Park and Schaller 2005). In general, individuals judge similar others more attractive (Berscheid and Walster 1979; Shanteau and Nagy 1979) and persuasive (Brock 1965; Byrne 1971).

Finally, evolutionary psychology offers another potential explanation for similarity-based preferences. Similar-looking people are more likely to be genetically related than dissimilar-looking people. Accordingly, if genetically related individuals favor similar-looking others, they may, as a group, improve their survival chances relative to others. There is ample evidence that humans and other primates have the capacity to recognize their kin (Porter and Moore 1981; Parr and de Waal 1999) and treat their kin preferentially in a variety of contexts (Burnstein, Crandall, and Kitayama 1994; Shavit, Fischer, and Koresh 1994). Furthermore, humans discriminate in favor of similar-looking others in trust games (DeBruine 2002, 2005) and in adoption decisions (DeBruine 2004). Interestingly, this tendency to provide altruism to similar others does not mean that we find them more attractive, presumably due to avoiding mating with close kin (DeBruine 2005).

Each of the three lines of argument summarized above relies, *albeit* to differing degrees, on judgments of similarity and familiarity. But facial similarity and familiarity are difficult, if not impossible, to disentangle—similar faces may also appear familiar. The proximity of the concepts creates considerable overlap between the evolutionary and social-psychological explanations for the similarity effect. One method of kin recognition, for example, is familiarity: your kin are the people with whom you interact disproportionately early in life, and are therefore more familiar to you. Thus, nature might have selected for people who favored familiar faces regardless of whether or not the faces in question were similar (Hepper 1991; Park and Schaller 2005). On the other hand, there is evidence of kin recognition in the absence of familiarity among some primates (Parr and de Waal 1999) and other animals (Hepper 1991).

The convergence of multiple lines of psychological research constitutes a compelling rationale for investigating the effects of facial similarity on voter behavior. Social psychology suggests that similarity, either as a proxy for familiarity or on its own, engenders preferences. Evolutionary psychology suggests that similarity, in and of itself, influences preferences because humans are driven to propagate their own genes. Moreover, similar faces are inherently familiar. Consequently, candidates whose faces appear similar to large amounts of voters are in unique positions to achieve influence.

Overview of Experiments

We developed the experimental design for manipulating candidate–voter facial similarity in a pilot study (Bailenson et al. 2006) using undergraduate students as the voters and a hypothetical male as the target candidate. In that study, for half of the participants, the photograph of the candidate was morphed with a photograph of the participant. For the other half of the participants, the candidate was shown unaltered. The results from the pilot study suggested first that self-morphing significantly influenced evaluations of the target candidate (at least for male voters, who shared the gender of the candidate), and second that the respondents were unaware that the images of the candidates had been morphed with their own photographs.

The current work strengthens the original design in several respects. First, to isolate the effect of facial similarity from any possible artifacts of digital morphing, we ensured that participants always saw a candidate's face morphed with either themselves or some other participant. In this way, any artifacts caused by the morphing *per se* (e.g., making a face more symmetrical and attractive) were held constant across subjects. Second, to boost the external validity of the findings, we used nationally representative samples as participants instead of college-age subjects and presented real rather than fictitious candidates to model an actual campaign setting. In addition, we adopted more advanced morphing technology and a masking technique that minimized artifacts stemming

from hair length or makeup. Finally, we also varied the gender and familiarity of the morphed candidates so that we could begin to disentangle, if possible, the effects of similarity, familiarity, and gender identity.

We report three studies in the current paper, each using a representative sample of voters. The purpose of the three studies was to systematically vary the factors that may mediate the degree of facial resemblance. By increasing the number of factors with which facial resemblance interacts across multiple experiments, we were better able to understand the theoretical parameters involved in nonverbal and verbal candidate evaluation.

In Experiment 1, we examined the effect of facial similarity among unfamiliar political candidates and hypothesized that the effect of facial similarity would be significant due to the lack of other cues or preexisting biases. One week before the 2006 Florida gubernatorial election we presented a national random sample of voters with photographs of unfamiliar candidates (Charlie Crist and John Davis) that had been morphed either with the voter filling out the survey or with an unfamiliar person. In other words, Experiment 1 allowed us to examine, as a first step, whether facial similarity could be used to sway political outcomes in the least-restricted scenario.

In Experiment 2 we replicated the design with familiar candidates (George W. Bush or John Kerry) one week before the 2004 presidential election. Our hypothesis was that the effect of facial similarity among familiar candidates would be significant, but minimal, due to the presence of preexisting biases and other information surrounding a presidential election. The effect of facial similarity would also be minimized because the study was administered so shortly before the actual election and many voters might have already made up their minds. Thus, Experiment 2 tested the effect of facial similarity in the most conservative and realistic way possible.

In Experiment 3 we combined different aspects of Experiments 1 and 2 by using a set of potential candidates (some familiar, some unfamiliar) for the 2008 presidential election. In the study, we also directly pitted forms of similarity (e.g., facial similarity and gender similarity) against candidate familiarity. We also manipulated candidate gender and pitted the effects of facial similarity against the effects of attitude similarity on salient political issues. Thus, Experiment 3 builds upon the first two studies by allowing us to understand the relative importance of facial similarity among other cues typically present in a political election. While the three studies are not in chronological order of when the election occurred, the current presentation allows the best conceptualization of the theoretical relationship between facial similarity and other factors.

Common Methods

There were a number of procedures and measures shared across the three experiments; for the sake of brevity we describe them all in this section.
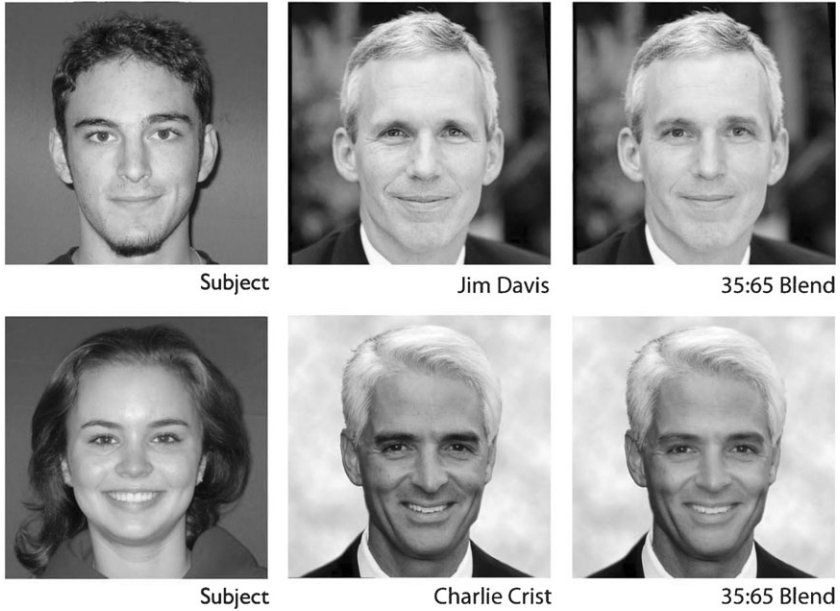
Figure 1. An Example of Two Participants from Experiment 1, One Morphed with Davis and One Morphed with Crist. Participants Saw the Two Images from the Right Panel Positioned Side by Side. Thus in Each Panel, One of the Candidates Was Morphed with the Subject Answering the Question, the Other with a Different Subject chosen Randomly from the Sample of Respondents.

IMAGE CHOICE AND MANIPULATION

In each study, we morphed a photograph of the participant into a photograph of a political candidate. The usability of each participant's photograph was determined based on the following criteria. A photograph was deemed suitable for morphing if (1) the individual was not wearing glasses, (2) the individual had no facial hair, (3) the photograph was taken under normal lighting conditions, (4) the individual was facing the camera, (5) the individual had a neutral facial expression, (6) the image had an acceptable resolution, and (7) the image was not blurred. Each acceptable image was cropped and rotated to be vertical if necessary. We used the software Magic Morph for the actual morphing process (see figure 1).

DEPENDENT MEASURES

Participants were asked to rate political candidates on a number of measures while viewing the manipulated photographs. We provide the exact wording of the survey items in the Appendix.

Table 1. Correlations between Measures Across All Three Experiments

	Affect	Trait	Vote	Thermometer
Affect		.55	.44	.53
Trait	.55		.62	.77
Vote	.44	.62		.59
Thermometer	.53	.77	.59	

Trait ratings: We asked participants to evaluate whether the following traits were applicable to the candidates: dishonest, moral, knowledgeable, cares about people, out of touch, warm, intelligent, friendly, principled, and strong leader. Participants responded on a four-point scale, ranging from "not well" (1) to "extremely well" (4). The negative traits "out of touch" and "dishonest" were reverse coded. We then averaged these trait ratings for each candidate. Cronbach's alphas for all three studies were larger than .80.

Affective response: We asked five questions concerning participants' reactions to the candidates. We specifically asked if there was anything that the candidates had ever done to make the participants feel angry, proud, disgusted, hopeful, or afraid. Every positive affective response was scored as a 1, and every negative affective response was scored as a -1. We then averaged these scores for each candidate. Cronbach's alphas for all three studies were larger than .75.

Feeling thermometer: We used a "feeling thermometer" rating from 0 to 100 in order to assess participants' general evaluation of the candidate. Participants who selected the "can't say" option were scored at 50.

Intention to vote: Participants were asked how likely they were to vote for each candidate in the upcoming election (either on a four-point or nine-point fully labeled scale depending on the study). Participants who selected the "can't say' option were given a score of the mid-range of the scale. We standardized the scores such that 1 was the maximum and 0 was the minimum, with higher scores indicating greater intention to vote for the candidate.

Overall preference score: The four outcome measures were highly correlated (see table 1) and data analysis was similar when evaluating the measures independently; consequently, we standardized ($M = 0$, $SD = 1$) each of the four indicators for each candidate and averaged them. In the first two studies where participants evaluated a pair of candidates, one candidate's preference score was subtracted from the other to create an evaluative difference score. The means and standard deviations of the dependent measures across studies by facial similarity condition are listed in table 2.

Table 2. Estimated Marginal Means and Standard Error of Measures by Facial Similarity Across Experiments

	Affect	Traits	Vote	Thermometer	Overall
Experiment 1					
High facial similarity	−.22 (.05)	.16 (.02)	.55 (.05)	56.11 (2.64)	.38 (.13)
Low facial similarity	−.22 (.05)	−.04 (.02)	.43 (.05)	45.83 (2.64)	−.13 (.13)
Experiment 2					
High facial similarity	−.11 (.34)	−.13 (.03)	.48 (.05)	50.30 (2.97)	.03 (.09)
Low facial similarity	−.35 (.34)	−.10 (.03)	.43 (.05)	49.73 (2.97)	−.02 (.09)
Experiment 3					
High facial similarity	.29 (.07)	−.27 (.03)	.44 (.05)	52.74 (2.67)	.04 (.09)
Low facial similarity	.20 (.06)	−.33 (.03)	.41 (.05)	47.47 (2.41)	−.06 (.09)

NOTE.—Affect and Traits range from −1 (negative) to 1 (positive), Vote ranges from 0 (no intention) to 1 (high intention), and Feeling thermometer ranges from 0 (low impression) to 100 (high impression). Overall is the mean of the standardized means of all four measures.

Strength of party affiliation: Participants were also asked whether they identified as Democrats, Republicans, or Independents. If they identified as Democrats or Republicans, they were asked how strongly they identified with that party. Participants were scored as 1 if they were strong Democrats, and −1 if they were strong Republicans, and weak partisans and independents were collapsed into an intermediate group scoring 0. We divided the variable in this manner because we believed strong partisans would be most resistant to the facial similarity variable.

Education level: Participants were also asked their level of education: less than high school, finished high school, some college, or bachelor's degree or higher. These options ranked from 1 (lowest) to 4 (highest). This measure was used as a covariate in our statistical models.

Morph detection: After each study was completed, we asked participants if they had guessed the purpose of the study and asked them to comment on the pictures of the candidates. Across the three studies, approximately 3 percent of the participants indicated that the pictures might have been retouched or "photoshopped," but not a single participant in any study mentioned the possibility that their own photograph had been inserted into the morph.

Experiment 1

DESIGN

Participants were shown a split-panel image of Charlie Crist and Jim Davis while they completed a multiple-page survey about the two candidates.

Participants had their own face either morphed with Crist or Davis at a ratio of 60 percent of the candidate and 40 percent of themselves. In the split-panel presentation, one candidate was morphed with the participant, while the other candidate was morphed with some other participant. This was done to ensure that observed effects were not attributable to the effects of morphing alone—composited faces in general are perceived to be more attractive than the original faces (Langolis and Roggman 1990). Thus, one of the images was morphed with the self (i.e., the evaluating voter) and the other candidate was morphed with another random subject (i.e., an unfamiliar face). The face used in the "other" condition was always a subject of the same gender and political party from the participant sample used previously in the self condition. Therefore, across participants, the exact same faces were used as self and other. This had the effect of controlling for factors such as attractiveness and idiosyncratic facial features.

We also balanced the experimental design in several ways. First, there was the same number of participants by gender and political affiliation—both existing variables in the prescreening database—in each condition. And secondly, in the split-panel presentation, we balanced the order of presentation (i.e., left versus right) for Crist and Davis.

PARTICIPANTS

Participants were recruited from the Polimetrix national panel, a service that recruits national samples of respondents via the Internet. The Polimetrix panel is opt-in. Approximately 2,000 participants from the Polimetrix panel accessed an invitation for this particular study asking them to upload a digital photograph. The need for the photographs was explained by a cover story describing the study as focusing on visual recognition ability. A total of 450 respondents uploaded their digital photos, of which 105 were selected for the study. The selection criteria were based on the quality of their photographs and the need to balance conditions by party affiliation and gender. Of those 105 subjects, 73 completed the final questionnaire. Consequently, the final stage cooperation rate was 69.5 percent. The average age of this final pool of participants was 51.0 (SD = 11.57, max. = 82, min. = 24).

PROCEDURE

Participants were asked to provide digital photographs of themselves approximately four weeks before the 2006 election during the month of October. The study was administered between October 30 and November 6, 2006, approximately a week before the election. Participants were directed to an online survey of political attitudes. The survey included several questions about Crist and Davis. The screens for the candidate questions included photographs of the two candidates shown side by side (see the rightmost panels in figure 1) that were visible on every screen for which subjects answered questions.

RESULTS AND DISCUSSION

For the preference score, we took the difference of the Crist overall score from the Davis overall score. We then conducted an ANOVA with facial similarity, participant gender, and strength of party affiliation as the independent variables, level of education as a covariate, and the overall preference score as the dependent variable. There was a significant effect of facial similarity ($F(1, 60) = 7.10$, $p = .01$, $\eta^2 = .09$). Participants morphed with Crist had a significantly lower overall preference score (i.e., preferred Crist), $M = -0.60$, SE = 0.24, than participants morphed with Davis ($M = 0.37$, SE = 0.27). No other effects approached significance. In sum, we found an extremely large effect of facial similarity in the current study in which respondents evaluated unfamiliar candidates in low-information elections. In Experiment 2 we tested the effect in a high-information election with familiar candidates.
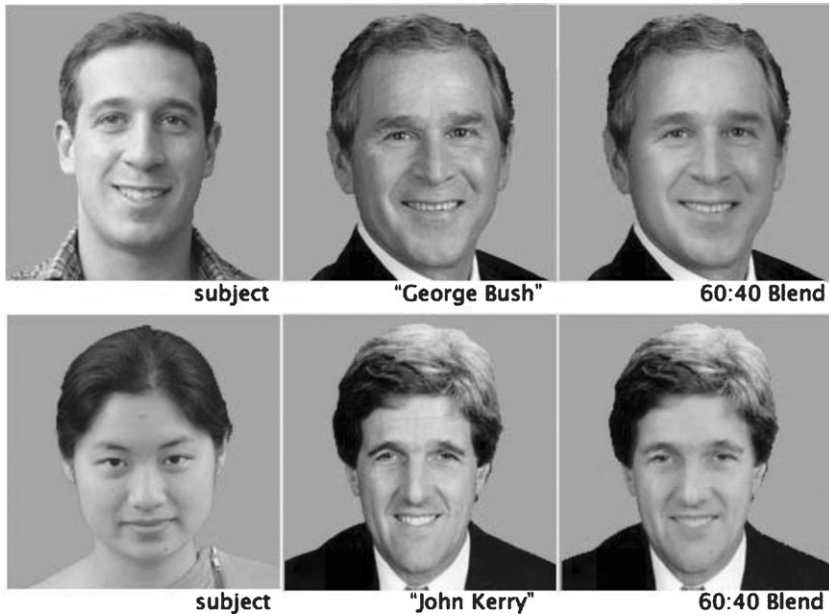
Experiment 2

DESIGN

Participants were shown a split-panel image of George Bush and John Kerry while they filled out a multiple-page survey about the two candidates. Depending on condition, participants had their own face morphed with either Bush or Kerry. Within each of the morph conditions, we varied the contribution of the subject's face to the image of the candidate. Half of the participants saw images that represented a blend of 80 percent candidate and 20 percent self; the remaining half were assigned to a ratio of 60:40. The effects of the morph level manipulation proved nonsignificant, and in the analysis that follows we pool across the two levels. As in Experiment 1, we used a split-panel design where the participant was morphed with one candidate, and a different participant (of the same gender and party affiliation) was morphed with the other candidate.

PARTICIPANTS

Participants were recruited from the Knowledge Networks national panel, recruited through conventional telephone surveys and offered free web access (via Web-TV) in exchange for their regular participation in surveys. For this study, Knowledge Networks reports that the panel recruitment response rate was 27.0 percent and the profile rate was 53.1 percent. A total of 2,777 Knowledge Networks panelists were invited, of which 1,521 completed a screening survey (55 percent). Of the 841 who qualified to participate in the study, 596 uploaded a digital photo (71 percent). The cumulative response rate, based on the AAPOR RR1 formula, through the photo uploading stage was 5.5 percent. We chose 200 of these photographs based on their quality and the need to balance conditions by party affiliation and gender. Altogether

Figure 2. An Example of Two Subjects from Experiment 2, One Morphed with Bush and One Morphed with Kerry. Participants Saw the Two Images from the Right Panel Positioned Side by Side. Thus in Each Panel, One of the Candidates Was Morphed with the Subject Answering the Question, the Other with a Different Subject Chosen Randomly from the Sample of Respondents.

190 people participated in the survey. We eliminated 12 participants due to incomplete survey results. The final stage completion rate was 89.0 percent.

Forty participants were assigned to each of the four conditions resulting from crossing morph target with morph level or percentage. The average age of participants was 41.05 (SD = 14.76, max. = 83, min. = 18).

PROCEDURE

Participants were asked to provide digital photographs approximately three months before the 2004 presidential election. Figure 2 shows images of George Bush, John Kerry, two study participants, and the resulting candidate–participant morphs.

The study was administered between October 24 and November 1, 2004, approximately a week before the election; the remainder of the procedure was identical to the previous study.

RESULTS AND DISCUSSION

For the overall preference score, we subtracted the preference score of Kerry from the score of Bush, such that a positive score indicated an overall
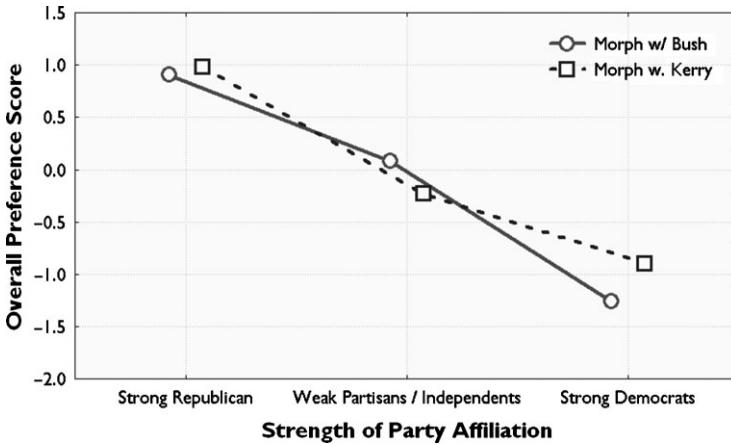
Figure 3. The Effects of Facial Similarity and Party Affiliation on Candidate Preference Score in Experiment 2. Higher Scores Indicate More Support for Bush.

preference for Bush. We ran an ANOVA with facial similarity, strength of party affiliation, and participant gender as the independent variables, education level as a covariate, and the overall preference as the dependent variable. We found a significant main effect of strength of party affiliation ($F(2, 131) = 70.00$, $p < .001$, $\eta^2 = .44$). Strong Republicans were significantly more approving of Bush ($M = 0.95$, SE $= 0.11$) than Strong Democrats ($M = -1.08$, SE $= 0.13$), and this effect was linear in that respondents with strong party affiliations supported their candidates more than respondents with weak party affiliations and independents. No other main effect proved significant.

We observed a significant interaction between facial similarity and strength of party affiliation ($F(2, 131) = 2.72$, $p = .07$, $\eta^2 = .02$), as depicted in figure 3. A comparison of the 95 percent confidence interval of the condition means showed that the only significant effect was that the weak partisan/ independent group had significantly different preference scores depending on whether they were morphed with Bush ($M = 0.08$, SE $= 0.11$) or Kerry ($M = -0.23$, SE $= 0.11$), $p < .05$. Thus, weak partisans and independents moved significantly toward the candidate with whom they had been morphed. None of the other comparisons or two-way interactions proved significant.

These results demonstrate that nonverbal similarity cues exert a significant impact on candidate evaluations, even in "high stimulus" campaigns where voters have ample opportunity to acquire cognitive information (e.g. the candidates' track records, policy positions, personality traits, etc.). In this context, it is not surprising that facial similarity is no match for partisan similarity as a basis for identifying with one of the candidates. Nonetheless, when the partisan similarity cue was weak, facial similarity did act as a political bond. The

magnitude of the facial similarity effect among weak partisans and independents was small, but, as shown in these data, sufficient to prove pivotal in a closely contested election. If we limit the analysis to vote choice, among participants who were morphed with John Kerry, Kerry received a clear plurality of the votes (47 percent, with 41 percent for Bush and 12 percent undecided); however, when participants were morphed with George Bush, Bush won a majority of the votes (53 percent, with 38 percent for Kerry and 9 percent undecided). Using an ANOVA with the factors described above and intention to vote as a dependent variable, the effect of facial similarity is significant with a one-tailed test, $F(1, 137) = 2.74$, $p < .05$, $\eta^2 = .02$.

At the very least, the significant interaction between strength of partisan identity and facial similarity in a campaign as salient as the 2004 presidential race suggests that facial cues are difficult to suppress. Given that Experiment 1 demonstrated stronger effects with unfamiliar candidates than Experiment 2 did with familiar candidates, we designed Experiment 3 to directly test this relationship.

Experiment 3

In addition to the facial similarity manipulation, Experiment 3 incorporated alternative bases for identifying with candidates, most notably, the candidate's familiarity and gender. In addition, we pitted the effects of nonverbal similarity against ideological or policy similarity by providing participants with information concerning the candidates' policy preferences. When voters are simultaneously made aware of the candidates' facial and ideological similarity, which of these cues takes precedence?

DESIGN

In this study, participants were shown a manipulated image of one of eight potential 2008 presidential candidates. These candidates varied by gender, party affiliation, and familiarity. The familiar Democrats were Hillary Clinton and John Edwards; the less familiar Democrats were Jennifer Granholm (Governor, MI) and Evan Bayh (US Senator, IN). The familiar Republicans were Elizabeth Dole and Rudy Giuliani, while the unfamiliar Republicans were Kay Bailey Hutchison (US Senator, TX) and Robert Ehrlich (Congressman, MD). A posttest in which the respondents from the current study rated the familiarity of the eight candidates (after all of the other dependent measures were collected) confirmed the difference between the two conditions. Table 3 shows the means and standard deviations of those ratings. A *t*-test indicated that the four preselected familiar candidates were rated as more familiar than the unfamiliar candidates $t(267) = 11.70$, $p < .001$.

There were two conditions for the facial similarity variable—self and other. Half of the participants saw an image of a candidate that was partially morphed

Table 3. Candidate Familiarity Ratings

| Candidate	Mean	SD	*n*
Robert Erlich	2.80	0.473	35
Jennifer Granholm	2.97	0.177	35
Evan Bayh	2.80	0.473	35
Kate Hutchinson	2.50	0.673	22
Hillary Clinton[a]	1.44	0.504	32
Elizabeth Dole[a]	2.31	0.718	35
John Edwards[a]	2.07	0.785	30
Rudy Giuliani[a]	1.88	0.640	34

NOTE.—Responses were measured on a three-point scale with 1 denoting "very familiar," 2 denoting "somewhat familiar," and 3 denoting "not familiar at all."

[a]Denote familiar candidates.

with their own face (at the ratio of 35 percent participant, 65 percent candidate) and the other half saw an image of a candidate partially morphed, at the same ratio, with another participant's face. The morphed images were displayed at a resolution of 400 × 400 pixels.

In this experiment we also manipulated policy similarity so that the candidate either took the same (or opposing) position as the subject on two prominent policy issues. Participants indicated their positions on how quickly US troops should be withdrawn from Iraq and on whether American jobs should be outsourced abroad. The exact wording of these questions appears in the Appendix. The candidates either presented a similar or opposing opinion on those two issues in an accompanying biographical statement presented beneath his or her photograph. For the troop withdrawal question, the response options included three months, six months, one year, two years, three to five years, and no time limit. In the policy similarity condition, the candidate's position was forced to be identical to the participant's response. In the dissimilar condition, the opinion attributed to the candidate was either two response options to the right or left (depending on the participant's placement on the scale) of the participant. Thus, if the participant responded "six months," the candidate's position in the dissimilar condition was "three to five years." In the case of participants responding "one year," the candidate was randomly assigned to either "three months" or "no time limit." If the participant indicated "can't say," then the candidate was randomly assigned to a position. We used a similar process for the outsourcing question so that the candidates either agreed or disagreed with the participant's own position.

Our third identity cue was partisan similarity. As in Experiment 1, participants were asked to indicate the strength of their partisan affiliation. They were assigned a score of 1 if their affiliation was "strong" and matched that of the candidate whose face was blended with the participant (33 percent of the
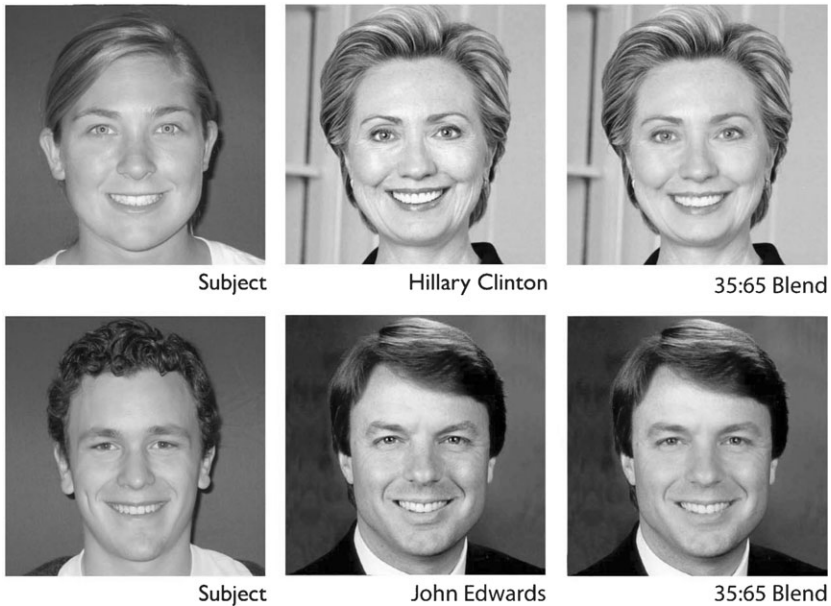
Figure 4. An Example of Two Subjects from Experiment 3, One Morphed with Clinton and One Morphed with Edwards. Participants Saw One of the Morphed Images in the Right Panel.

sample), a −1 if strongly identifying with the opposing party of the candidate whose face was blended with the participant (30 percent), and 0 for all others (37 percent). Thus, as in the previous study, nonpartisans and weak partisans were collapsed.

The final two predictor variables were candidate familiarity (high or low) and gender similarity (high if the candidate's gender was the same as the participant, low if not).

For each of the eight prospective candidates, we balanced the number of participants by gender (male or female) and party affiliation (Democrat, Independent, or Republican) across both morph conditions (self, other). We assigned three participants to each of these 12 cells. Thus, there were 36 participants assigned to each candidate and 288 participants altogether, of which 144 were morphed with a candidate. Figure 4 provides an example of a participant–candidate morph in the Clinton and Granholm conditions.

For each candidate, the morphed images from the self-morph condition served as the stimuli for the participants in the other-morph condition. For example, three male Democrats were morphed with Hilary Clinton. These three morphed images were then presented to the three male Democrats in the other-morph condition.

PARTICIPANTS

Participants were recruited in September, 2005. For this study, Knowledge Networks reports that the panel recruitment response rate was 30.6 percent and the profile rate was 53.5 percent. A total of 8,342 Knowledge Networks panelists were invited, of which 4,237 completed a screening survey (51 percent). Of these, 1,132 qualified for the study and 630 uploaded their digital photos (56 percent). The cumulative response rate (AAPOR RR1) through the photo uploading stage was 4.8 percent. The same cover story was utilized to explain the need for subject photographs. We selected 288 of these participants (none of whom were involved in the previous study) based on the photographic criteria described earlier and the need to balance cells by party affiliation and gender. Of the 288 participants, 144 were assigned images of a candidate morphed with their own face, while the remaining 144 were assigned images of a candidate morphed with the face of another participant of the same gender. Given the high percentage of apparently Caucasian participants in the previous two studies (and the fact that the candidates were all Caucasians), in this experiment we used only Caucasian participants. Of the 288 participants, 270 completed the survey resulting in a final stage completion rate of 93.7 percent. The average age of participants was 40.39 (SD = 14.98, max. = 79, min. = 18).

PROCEDURE

Approximately three months elapsed between the collection of photographs and the implementation of the survey, which was administered between January 1 and January 11, 2006. The details of the procedure were identical to the other studies, except that instead of viewing two candidates in a split-panel image, participants only evaluated a single photograph of one candidate.

RESULTS AND DISCUSSION

We used ANOVA to examine the effects of candidate familiarity and the four different indicators of candidate similarity (facial, policy, partisan, and gender) on the overall candidate preference score. As in the previous experiments, we included level of education as a covariate. Moreover, in this study the ANOVA model was restricted to include only the two-way interactions in order to maintain at least 10 subjects in each cell for all comparisons (see Kenny 1985). Figure 5 shows the means of the three significant interactions. As in Experiment 2, there was a substantial main effect of partisan similarity ($F(2, 220) = 4.45$, $p = .01$, $\eta^2 = .03$). Strong partisans evaluated candidates of their own party rated more favorably ($M = 0.26$, SE = 0.11) than candidates of the opposing party ($M = -0.18$, SE = 0.13), $p < .05$, according to comparisons of 95 percent confidence intervals.

The main effect of policy similarity proved significant, in that participants rated candidates whose positions agreed with their own more favorably
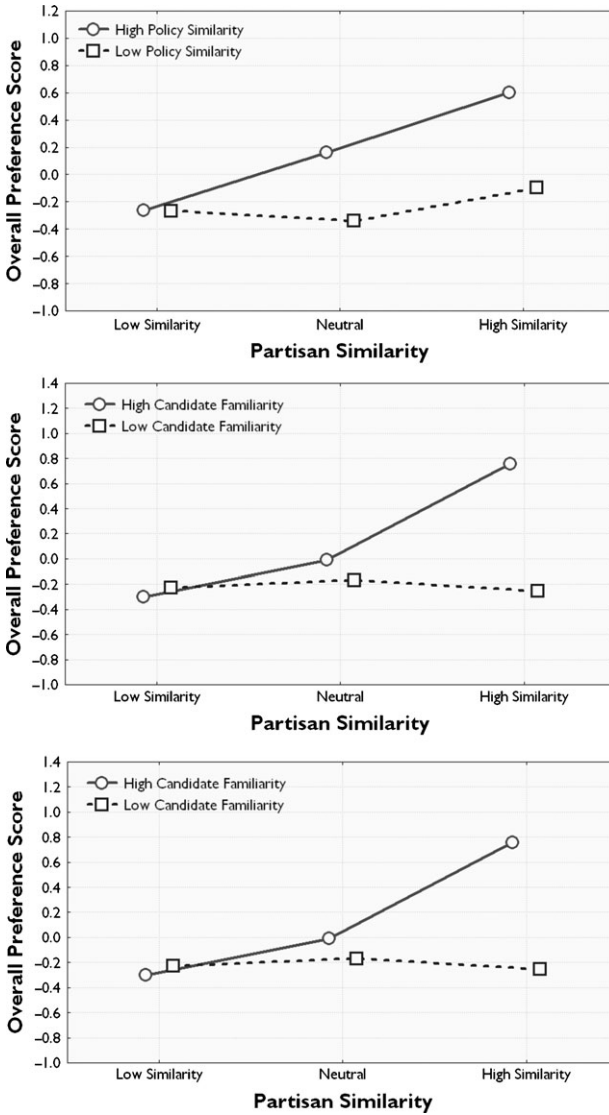
Figure 5. The Three Significant Interactions from Experiment 3. Higher Scores Indicate More Support for a Given Candidate.

($M = 0.16$, SE $= 0.08$) than candidates with opposing positions ($M = -0.16$, SE $= 0.09$), $F(1, 220) = 7.33$, $p = .007$, $\eta^2 = .02$. Candidate familiarity also proved significant as a determinant of voter preference ($F(1, 220) = 7.72$, $p = .01$, $\eta^2 = .05$). Participants rated familiar candidates more favorably ($M = 0.16$, SE $= 0.08$) than unfamiliar candidates ($M = -0.17$, SE $= 0.09$).

There was a significant interaction between partisan and policy similarity ($F(2,220) = 8.95$, $p = .03$, $\eta^2 = .02$). The effects of partisan similarity were strong when the candidates offered similar positions on the issues but negligible when they offered opposing positions. In effect, agreement on the issues is necessary for partisan voting; when voters perceived policy disagreements with the candidate, they ignored the partisan similarity cue.

There was also a significant interaction effect between party similarity and candidate familiarity ($F(2, 220) = 8.95$, $p < .001$, $\eta^2 = .06$). Familiar candidates were rated significantly more favorably when they were of the same party ($M = 0.80$, SE $= 0.15$) than in the opposing party ($M = -0.32$, SE $= 0.15$), $p < .05$, according to post-hoc tests. But for unfamiliar candidates, partisanship made little difference. In other words, it is the more, rather than the less, familiar candidate whose evaluations are based on partisan similarity.

Finally, we replicated the findings from the first two studies via direct comparison with a significant interaction between facial similarity and candidate familiarity ($F(1, 220) = 5.07$, $p = .03$, $\eta^2 = .02$). The effects of similarity were limited to unfamiliar candidates. Among familiar candidates, participants' evaluations were unaffected by facial cues, but when the candidate was unfamiliar, participants' evaluations were significantly more favorable when there was high ($M = 0.02$, SE $= 0.12$) rather than low facial similarity ($M = -0.33$, SE $= 0.12$), $p < .05$. Thus, the effects of facial and partisan similarity diverged with respect to candidate familiarity.

In this study, we did not observe the interaction between strength of party affiliation and facial similarity observed in Experiment 2. In other words, the effect of facial similarity was not amplified among weak partisans or independents. We suspect that the manipulation of policy similarity proved sufficiently overwhelming for both groups to ignore facial cues. When voters were given explicit information concerning a candidate's proximity to their own policy positions, the effects of facial similarity only applied to less familiar candidates.

General Discussion

In these three studies we demonstrated a moderate but consistent effect of facial similarity on evaluations of actual candidates. To further explore the relationship between familiarity and similarity, we pooled data from the three studies into a single analysis (see Ansolabehere and Iyengar 1995 for a similar analysis), and divided the candidates into either familiar (Bush, Kerry, Clinton, Dole, Edwards, and Giuliani) or unfamiliar (Bayh, Crist, Davis, Erlich, Granholm, and Hutchison) categories. We then tested the effects of facial similarity on the overall preference score with the goal of comparing effect sizes for both familiar and unfamiliar candidates. The results indicated no relationship between similarity and preference score for familiar candidates (partial eta-squared $= .00$), but a larger one for unfamiliar candidates (partial eta-squared $= .04$). Overall, familiar candidates were not helped by facial similarity. As in

previous research (Levin, Whitener, and Cross 2006), similarity is a heuristic which is relied upon more in unfamiliar relationships than in familiar ones. In all three studies (as well as the previous pilot study), the effect of facial similarity was heightened when other competing identity cues were less salient.

Of course there are a number of limitations to the current study. For example, given the restrictions we have placed on our pool of respondents—no facial hair, glasses, or non-Caucasians—the findings are not completely generalizable to the entire voter population. Moreover, these restrictions might have actually biased our subject pool toward becoming more similar to our candidates, as visual outliers were excluded from the sample. Future studies should examine the base similarity of voters to candidates on a continuum and examine the distribution of facial resemblance on vote preference.

Furthermore, in the current set of studies, there was no control condition presenting unaltered photographs. In our original pilot study, we included a condition in which voters evaluated unaltered images of candidates with no morph at all (Bailenson et al. 2006), and demonstrated an advantage for candidates morphed with the self over that unmorphed control condition. The problem with that condition as a control is that the mere act of morphing causes an increase in symmetry and decreases blemishes in faces, two mechanisms known to increase attractiveness. Consequently, there is a confound in this type of control, and a better matched control condition is morphing a face with an unfamiliar person (e.g., DeBruine 2002). However, in the context of election applications, it makes sense to examine the pure advantage a candidate would gain given a morphed photograph over an unaltered photograph. A more systematic examination comparing morphed and unmorphed photographs of political candidates would be worthwhile.

Moreover, the current study only examines the static similarity, using simple still photographs to create varying degrees of facial resemblance. An interesting area for follow-up research would be to examine similarity in the typical dynamic exchanges one sees in political advertisements, debates, and speeches. Given that a high amount of contact between voters and candidates occurs via television, radio, and other media that feature dynamic behavior, the opportunities to study similarity and preference would be substantial. In previous research, we have demonstrated that similarity in mediated nonverbal behavior causes high amounts of social influence. Specifically, when one uses digital media to automatically copy head movements (Bailenson and Yee 2005) or handshake styles (Bailenson and Yee 2006), they become more persuasive. Future work should extend these findings to political discourse.

In addition, recent research has demonstrated that voters rely on evaluation of the candidates' character when making their decision (Bishin, Stevens, and Wilson 2006). In future work, it would be valuable to examine the relationship between character evaluations and facial similarity. Along those lines, research which examines implicit measures of emotional evaluations (Wilson and Dunn 1986; Marcus et al. 2006) may prove to be a more effective gauge of affective

attitudes than the formal, explicit measures used in the current study. Previous work has used emotional evaluations of trustworthiness as a mechanism to explain the social influence effects of face morphing (DeBruine 2005); extending that methodology to the current studies would be worthwhile.

Previous work (see Marcus, Neuman, and MacKuen 2000 for a review) has suggested that attention to nonverbal cues may depend on emotional arousal. In particular, when people are made anxious, they are more apt to consider novel cues when evaluating candidates. Unfortunately, our studies did not include multiple measures of voter anxiety. In future work, we intend to manipulate the anxiety level of respondents more systematically by having them watch either high-anxiety or low-anxiety political advertisements, and then examine the results of facial similarity on candidate preference in relation to the level of anxiety. Given that previous work has provided a thorough framework for evaluating emotional cues during political judgments (Marcus et al. 2006), measuring these cues should help quantify the effects of facial resemblance.

These results convey clear implications for the study of voting behavior. While other scholars (e.g. Todorov et al. 2005) have demonstrated that candidates who look more "competent" win elections, they have not identified the characteristics of faces that make voters evaluate a candidate more favorably. Our work demonstrates that facial similarity is one such characteristic. Increasing the facial resemblance between candidates and voters can alter electoral results, especially when the candidate is unfamiliar. The effects persist on a limited basis even when the information is conveyed about familiar candidates, one week before a closely contested presidential election. Given the revolution in information technology, we have no doubt that political strategists will increasingly resort to transformed facial similarity as a form of campaign advertising.

Appendix: Details of Survey Questions

SURVEY QUESTIONS: EXPERIMENT 1

How often do you participate in political conversations?
    Almost every day
    Several times a week
    At least once in a week
    At least once in a month
    Only few times a year
    Practically never

How many days did you watch TV news last week?
    Every day
    Four or five

A couple of times
Not all

Describe your interest in politics
Very interested
Somewhat interested
Not very interested
Not all interested

What is your party identification
Democrat
Republican
Independent
Other party
No preference
Cannot say

How strong is your party identification
Strong
Not very
Cannot say

How do you think of yourself ideologically
Extremely liberal
Liberal
Somewhat liberal
Moderate
Somewhat conservative
Conservative
Extremely conservative
Cannot say

Now, we'd like to get your feelings toward [candidate] on a "feeling thermometer." On this scale, ratings between 50 degrees and 100 degrees mean that you feel favorable or warm toward [candidate]. Ratings between 0 degrees and 50 degrees mean that you feel cold or unfavorable toward him. You would rate [candidate] at the 50 degree mark if you didn't feel particularly warm or cold toward him.

———Degrees

Think about [candidate]. Has [candidate]—because of the kind of person he is, or because of something he has done or said—ever made you feel:
[Angry]
[Proud]
[Disgusted]
[Hopeful]
[Afraid]

Yes
No
Can't say

For each, please indicate whether the word or phrase describes [candidate] extremely well, quite well, not too well, or not well at all. If you're not sure, check Can't say.
[Moral]
[Really cares about people like you]
[Knowledgeable]
[Provides strong leadership]
[Warm]
[Dishonest]
[Intelligent]
[Friendly]
[Out of touch with ordinary people]
[Principled]

Extremely well
Quite well
Not too well
Not well at all
Can't say

Would you vote for [candidate] in Florida Gubernatorial Election
Yes, I would definitely vote for
Might vote for
Might not vote for
No, I would definitely not vote for
Can't say

Education status
No HS
HS graduate
Some college
2-year college
College graduate
Postgrad

Marital status
Married
Separated
Divorced
Widowed
Never married
Partnership

Ethnicity
White
Black
Latino
Asian
Native American
Mixed
Other

Gender
Male
Female

SURVEY QUESTIONS: EXPERIMENT 2 (IF NOT REDUNDANT WITH ABOVE)

How closely have you been following the presidential campaign this year?
Almost every day
On a regular basis
Now and then
Hardly at all

Now think about [candidate]. Has [candidate]—because of the kind of person he is, or because of something he has done or said—ever made you feel:
[Angry]
[Proud]
[Disgusted]
[Hopeful]
[Afraid]

1 Yes
2 No
3 Can't say

Now we'd like you to indicate which of the two candidates you think will do a better job on the following issues:
[Unemployment]
[Terrorism]
[Healthcare]
[The war in Iraq]
[Gas prices]
[Social Security]
[Education]

Bush
Kerry
No difference
Can't say

Finally, we'd like to know if you intend to vote in the November presidential election:
    Yes, I will vote
    No, I will probably not vote
    Not sure

Will you vote in person or by absentee ballot?
    In person
    Absentee ballot

    Do you expect to . . .
    Vote for George W. Bush
    Vote for John Kerry
    Vote for some other party's candidate
    Not vote

How certain do you feel you will vote that way? Are you:
    Very certain
    Somewhat certain
    Not very certain

SURVEY QUESTIONS: EXPERIMENT 3 (IF NOT REDUNDANT WITH ABOVE)

How quickly do you believe the US troops should be withdrawn from Iraq?
    Next 3 months
    Next 6 months
    Next 12 months
    Next 3–5 years
    No time limit
    Can't say

What do you think?
    Outsourcing helps the US economy . . .
    In-between/not sure
    Outsourcing hurts the US economy . . .

If [candidate] were the [Republican/Democratic] candidate for President, what is the likelihood that you would vote for [him/her]?
    1 Very high likelihood
    2
    3 Somewhat likely
    4
    5 50–50 chance of voting for him/her
    6
    7 Somewhat unlikely
    8
    9 Zero likelihood

What is [NAME]'s position on the timetable for withdrawing US troops form Iraq?

    Next 3 months
    Next 6 months
    Next 12 months
    Next 3–5 years
    No time limit
    Can't say

And how about free trade, what is [NAME]'s position on that issue?

    Outsourcing helps the US economy . . .
    In-between/not sure
    Outsourcing hurts the US economy . . .

How familiar is this candidate to you?

    Very familiar
    Somewhat familiar
    Not familiar at all
    Can't say

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