

Elected in 100 milliseconds: Appearance-Based Trait Inferences and Voting

Christopher Y. Olivola · Alexander Todorov

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Abstract Recent research has shown that rapid judgments about the personality traits of political candidates, based solely on their appearance, can predict their electoral success. This suggests that voters rely heavily on appearances when choosing which candidate to elect. Here we review this literature and examine the determinants of the relationship between appearance-based trait inferences and voting. We also reanalyze previous data to show that facial competence is a highly robust and specific predictor of political preferences. Finally, we introduce a computer model of face-based competence judgments, which we use to derive some of the facial features associated with these judgments.

Keywords First impressions · Voting · Political decision making · Face perception · Social cognition

“Men in general judge more from appearances than from reality.”
—*The Prince* (1532/1898) (Niccolò Machiavelli 1469–1527)

In their attempt to understand and model voting behavior, modern political scientists and public choice economists have largely assumed that voters are rational actors, whose political choices are free from biases and resistant to the influence of irrelevant cues (Kuklinski and Quirk 2000; Quattrone and Tversky 1988). A functioning democratic system, which gives its citizen the power to choose their leaders and shape critical policies, requires that voters are, for the most part, reasonable and that society can trust them to make sound judgments.

C. Y. Olivola (✉)
Department of Cognitive, Perceptual and Brain Sciences, University College London,
26 Bedford Way, London WC1H 0AP, UK
e-mail: c.olivola@ucl.ac.uk

A. Todorov (✉)
Department of Psychology, Princeton University, Princeton, NJ 08540, USA
e-mail: atodorov@princeton.edu

However, voting is no simple process. Today's political candidates hold complex and nuanced views. The choice of which candidate to elect requires voters to make tradeoffs on a number of important dimensions, including religious, economic, moral, security, social, international, and domestic issues. The flood of information about candidates coming from newspapers, radio, television, and the Internet, also means that voters are inundated with facts, rumors, quotes, interviews, pictures, and other cues that they must properly filter, encode, organize, retain, and later retrieve, to make fully informed choices.

Yet the field of cognitive psychology teaches us that, when faced with more information than it can (or chooses to) handle, the mind tends to simplify the decision process by relying on simple rules or heuristics (Kahneman et al. 1982). Given the complexity of voting, it should come as no surprise that voters take mental shortcuts to arrive at their final decisions. Indeed, research on political choice has identified a number of heuristics that voters use to simplify the decision process (Lau and Redlawsk 2006; Riggie 1992). For example, many voters seem to rely heavily on party affiliation when selecting candidates (Bartels 2000). This is a reasonable strategy to the extent that party affiliation is a good predictor of a candidate's positions on many issues. Other strategies involving the use of superficial cues, however, are not so normatively defensible, and thus call into question the notion of the rational voter.

Nonverbal cues, in particular, provide a channel, separate from more explicit verbal information, through which voters often form impressions about candidates (Noller et al. 1988). Indeed, a variety of nonverbal cues have been shown to correlate with political perception and decision making. For example, Gregory and Gallagher (2002) performed a spectral analysis of candidates' voice frequencies in 19 nationally televised American presidential debates. They found that this nonverbal auditory cue revealed a candidate's relative social dominance within a debate, and it also predicted his vote share in the election. Given evidence that visual cues are becoming more prevalent in presidential elections, while auditory cues are becoming less so (Bucy and Grabe 2007), we might expect the former to be especially influential. Indeed, a number of studies have demonstrated a relationship between various forms of nonverbal visual cues and political preferences. Cherulnik et al. (2001) found that audience members were more likely to imitate the nonverbal behaviors of highly charismatic political candidates (who exhibited more smiling and visual attention to the audience) than to less charismatic candidates. Presumably, this emotional contagion would lead to increased liking of the charismatic candidates. Bucy (2000) found that politicians' nonverbal reactions to important news events impacted how voters perceived them.

Nonverbal visual cues can also impact politicians' electoral success indirectly. Friedman et al. (1980) analyzed the facial expressions of news broadcasters who covered the 1976 presidential election campaign. They found significant differences in the perceived positivity of broadcasters' facial expressions when they uttered different candidates' names. Mullen et al. (1986) replicated this result with the 1984 presidential election and demonstrated, further, that a broadcaster's facial expressions could be related to voters' political preferences. Specifically, voters seemed to favor the candidate for whom the biased broadcaster exhibited more positive facial expressions. Babad (1999, 2005) obtained similar results in the domain of political interviews: He found, not only that interviewers exhibited differential levels of positive and negative nonverbal behaviors toward the politicians they were interviewing (Babad 1999), but that an interviewer's nonverbal behavior could impact how viewers perceived the politician (Babad 2005). In particular, a politician's image suffered when the interviewer was hostile rather than friendly.

In this paper we focus on one particularly superficial nonverbal-cue-based strategy: judging a candidate's personality traits from his or her facial appearances, and using this cue to inform one's political choices. Although appearances also provide us with information about a candidate's gender, ethnicity, and physical attractiveness—variables that have been shown to impact voting (e.g., Banducci et al. 2008), we limit our inquiry to personality traits.

In the first section entitled “[Trait Inferences from Appearance](#)”, we briefly review the literature on appearance-based trait inferences, which shows that people draw rapid inferences from appearances and that these inferences, in turn, affect their judgments and choices. In “[Trait Inferences in the Political Domain](#)”, we turn to studies that have examined the relationship between appearance-based inferences and political decisions, to show that voters may in fact be influenced by appearances (see also Hall et al. 2009). We specifically focus on inferences of competence, as these seem to be particularly strongly correlated with election outcomes (Ballew and Todorov 2007; Todorov et al. 2005). In “[The Predictive Power of Facial Competence Judgments](#)”, we provide additional evidence for the predictive power of perceived competence from facial appearance. We analyze data from multiple trait judgments of politicians' faces to determine the correlates of facial competence judgments and whether these correlates can account for the observed relationship between perceived competence and electoral success. In “[Facial Determinants of Competence Inferences](#)”, we explore the potential determinants of face-based competence inferences by building a computer model of variations in facial competence. By exaggerating faces along the competence dimension, we can determine the facial cues that give rise to inferences of competence. We report three behavioral studies exploring these cues. The results show that inferences of competence are tightly linked to facial maturity and attractiveness. In the final section entitled “[Appearance Effects in the Real World](#)”, we discuss, in light of recent political science studies (Lenz and Lawson 2008), the potential impact of inferences from facial appearance on actual voters. This impact is related to external variables such as the visibility (e.g., Senate vs. House) and the competitiveness of the races, as well as internal variables such as voters' political knowledge and exposure to television. Consistent with psychological models of persuasion (Todorov et al. 2002), appearance is most likely to influence less knowledgeable voters who watch a lot of TV (Lenz and Lawson).

Trait Inferences from Appearance

People draw inferences about others' traits and underlying characteristics from their appearances (e.g., Hall et al. 2009; Hassin and Trope 2000; Langlois et al. 2000; Montepare and Zebrowitz 1998; Olivola and Todorov *in press*; Todorov *in press*; Todorov et al. 2008; Zebrowitz 1997; Zebrowitz and Montepare 2005). In fact, these inferences often occur spontaneously (Todorov and Uleman 2002, 2003) and rapidly (Bar et al. 2006; Locher et al. 1993; Olson and Marshuetz 2005; Todorov 2008; Todorov et al. 2009; Willis and Todorov 2006), thereby leaving little room for deliberate thought processes to inhibit or correct the resulting judgments (Kahneman 2003). For example, Willis and Todorov (2006) showed that trait judgments (e.g., competence, trustworthiness, aggressiveness) made after 100-ms exposures to faces were highly correlated with judgments made in the absence of time constraints. Subsequent studies showed that as little as 33 ms of masked exposure to faces is sufficient for people to make trait judgments (Todorov et al. 2009). The correspondence between rapid-exposure judgments and control judgments made in the

absence of time constraints improved substantially when time exposure was increased to 167 ms but very little with longer exposures. The minimum exposure needed to make these judgments is quite remarkable given that exposures shorter than 100 ms are not sufficient for saccadic eye movements and, thus, do not allow for visual exploration of the face. In other words, these impressions are “single glance” impressions. More generally, speed and spontaneity seem to characterize the way our minds process many nonverbal cues (Hassin et al. 2005; Lakin 2006).

Given the rapid and effortless nature of appearance-based inferences, it is not surprising to find that they impact the decisions that people make in a variety of important domains, including mate choice (Olivola et al. 2009), business/finance (Gorn et al. 2008; Naylor 2007; Pope and Sydnor 2008; Ravina 2008; Rule and Ambady 2008), law/forensic-science (Blair et al. 2004; Eberhardt et al. 2006; Zarkadi et al. 2009; Zebrowitz and McDonald 1991), and the military (Mueller and Mazur 1996). For example, Zebrowitz and McDonald (1991) found judicial decisions to be influenced by the defendants’ and plaintiffs’ facial features: Mature-looking defendants were required to pay larger monetary awards, in small claims courts, when the plaintiffs were babyfaced. More recently, we found evidence that appearance-based trait inferences seem to impact mate selection, even after controlling for physical attractiveness (Olivola et al. 2009): Appearing extraverted and open to new experience was positively related to dating success for male users of an online dating site, while appearing ambitious, competent, self-disciplined, and trustworthy had the opposite effect for female users. We also found that appearance-based trait inferences seemed to impact the preferences of speed-dating participants.

It is a puzzle why people make appearance-based trait inferences, given that these inferences often do not facilitate accurate social judgments (Olivola and Todorov *in press*). One possibility consistent with the existing empirical evidence is that such inferences are based on cues that have adaptive significance (Todorov et al. 2008; Zebrowitz 2004; Zebrowitz and Montepare 2006, 2008). For example, computer modeling work suggests that inferences of trustworthiness derive from the similarity of emotionally neutral faces to expressions of happiness and anger (Oosterhof and Todorov 2008). Faces that structurally resemble happy faces are perceived as trustworthy, whereas faces that resemble angry faces are perceived as untrustworthy (see also Montepare and Dobish 2003; Said et al. 2009). That is, inferences from subtle cues related to emotional states may be inappropriately generalized to inferences of personality dispositions. However, this issue is beyond the scope of this paper.

Trait Inferences in the Political Domain

Inferences of Competence and Election Outcomes

As the evidence above makes clear, appearances have been shown to impact peoples’ choices in a variety of contexts. We might therefore expect political decision making to be similarly affected by appearance-based trait inferences, and indeed, a number of recent studies have shown this to be the case. In these studies, participants are shown pictures of people (usually photos of actual politicians) and asked to judge the photos on one or more dimensions (e.g., “how competent does this person look?”). These judgments are then compared to the outcomes of actual elections (involving the relevant politicians) or to the hypothetical voting decisions of a separate group of study participants (who are asked to indicate their willingness to vote for the persons shown in the pictures).

In the first such study (to the best of our knowledge), Martin (1978) found that competence judgments, based on the newspaper photographs of 11 politicians, predicted the outcomes of hypothetical and actual elections. Todorov and his colleagues (Ballew and Todorov 2007; Hall et al. 2009; Todorov et al. 2005) carried out more extensive studies of this sort for several major political races in the US (see Fig. 1). They found that facial competence similarly predicted vote share and likelihood of winning in the Senate, House of Representatives, and gubernatorial elections. These results were found to resist a number of alternative explanations, as the predictive power of facial competence held even when controlling for candidate familiarity, gender, race, incumbency, attractiveness, and age. Some of these alternative explanations are revisited in “[The Predictive Power of Facial Competence Judgments](#)”.

Critically, competence (and related traits such as intelligence and leadership) emerged as the only clear predictor of elections, despite the fact that similar judgments were collected for a number of other traits (see also “[The Predictive Power of Facial Competence Judgments](#)”). This makes sense because competence is considered to be one of the most important traits in a political candidate (Miller et al. 1986; Trent et al. 1993). In fact, the degree to which a specific trait judgment predicted the election outcomes was strongly correlated with the importance assigned to this trait (Hall et al. 2009). For example, judgments about traits that were deemed unimportant for a politician (e.g., reserved) did not predict the election outcomes better than chance. In contrast, judgments about traits that were deemed important (e.g., dependable, honest, organized) predicted these outcomes and the degree of successful prediction could be derived from the importance assigned to these traits. These findings suggest that voters have the “right” notions concerning the kinds of politicians that should be elected. However, some voters (see “[Appearance Effects in the Real World](#)”) may rely on the wrong cues to infer the right attributes. In other words, instead of basing their decisions on valid indicators of competence, they may rely on heuristic cues such as appearance (Lenz and Lawson 2008).

This hypothesis is consistent with evidence that appearance-based inferences can be made after extremely rapid exposures to faces (Todorov 2008; Todorov et al. 2009; Willis and Todorov 2006). In fact, Ballew and Todorov (2007) found that competence judgments made after 100 ms exposure to the faces of the winners and runner-ups in gubernatorial races were almost as accurate in predicting the election outcomes as judgments made after 250 ms and unlimited exposure. The predictive accuracy was indistinguishable in the latter two conditions, although judgments in the unlimited time condition took twice as long to make as those in the short exposure conditions. In a different experiment, Ballew and Todorov showed that forcing participants to make their judgments within 2 s (when no deadline was present, the average response time was about 3.5 s) did not affect the accuracy of predictions. The only manipulation that affected this accuracy was asking participants to deliberate and make good judgments. Under these instructions, predictions were actually *worse*. Additional analyses showed that accuracy could be traced to the automatic, rather than the deliberative, components of judgments. In a sense, given that people can make trait judgments from faces within a single glance, these findings are not surprising. People are generally unaware of the cues they use in their judgments from faces (Rule et al. 2008) and instructions to deliberate cannot help under such conditions (e.g., Wilson and Schooler 1991). These instructions simply introduce noise into the judgments (e.g., Levine et al. 1996). The point of the Ballew and Todorov experiments was to show that impressions of competence could be formed rapidly and effortlessly without any deliberation. Once formed, these impressions can influence voting decisions and this influence may not even be recognized by voters (Hall et al. 2009).

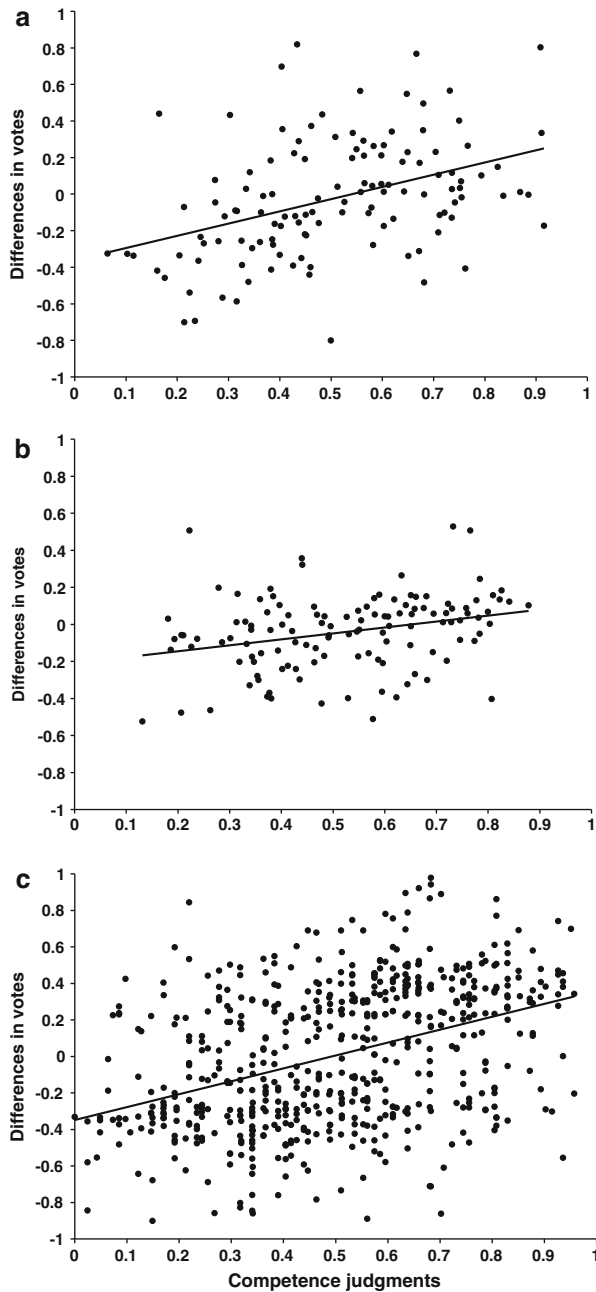


Fig. 1 Scatter plot of differences in vote shares and perceived competence of candidates for **a** Senate races ($n = 120$), **b** Gubernatorial races ($n = 124$), and **c** House races ($n = 600$). Each point represents a specific race. The line represents the best linear fit. These data include the Senate races from 2000 to 2006, the Gubernatorial races from 1996 to 2006, and the House races from 2002 to 2004

Replications and Extensions

A number of additional studies, by other research groups, have replicated the general finding that appearance-based competence judgments predict election outcomes (Antonakis and Dalgas 2009; Atkinson et al. 2009; Castelli et al. 2009; Lawson and Lenz 2007; Poutvaara et al. 2009). Three of these studies are particularly noteworthy because they rule out the possibility that competence judgments simply reflect media familiarity with the politicians despite lack of explicit recognition. Lawson and Lenz asked American participants to make facial competence judgments of Mexican politicians. These judgments predicted Mexican election outcomes and accounted for 18% of the variance in vote shares. Similarly, Poutvaara et al. (2009) showed that competence judgments provided by non-Finnish participants predicted the election outcomes in Finland, while Antonakis and Dalgas showed that competence judgments provided by Swiss participants predicted the results of French parliamentary elections.

The findings of Antonakis and Dalgas (2009) are particularly striking because they also showed that judgments collected from Swiss children predicted the outcomes of the French elections. Specifically, Antonakis and Dalgas asked children aged 5–13 years to play a computer simulated game in which they were asked to judge which person, in a pair of photos, they would choose to captain a boat through a difficult mission. Remarkably, the judgments of children and older participants were highly correlated. In fact, children's judgments predicted the election outcomes as well as those provided by the older cohort. These findings suggest that appearance-based trait inferences develop quite early and are surprisingly stable throughout a person's life. They are also inconsistent with the possibility that people learn to associate facial cues with actual competence and, hence, to make accurate judgments from faces. Further, this study used only run-off races in which the incumbent lost the election, so these effects cannot be attributed to confounding competence and incumbency (see also Ballem and Todorov 2007). Their results thus provide particularly strong evidence for the impact of facial competence, given that the "losers" in their sample looked competent enough to have won previous elections.

To the studies reviewed above (Antonakis and Dalgas 2009; Lawson and Lenz 2007; Poutvaara et al. 2009), we can add the work of Little et al. (2007) who used a morphing technique to control for recognition of politicians. Little et al. created novel pairs of faces from the faces of the candidates for the highest political posts in the US, United Kingdom, Australia, and New Zealand, using shape differences between the faces relative to an average male face. Hypothetical votes for the novel pairs of faces were highly correlated with actual votes in the respective countries. As we have shown, hypothetical votes are highly correlated with competence judgments (Todorov et al. 2005; see also Table 1 and Table 5 in this paper) and these findings may reflect rapid inferences of competence, on which participants based their choices.

Similar results have been obtained for appearance-based judgments of broader trait constructs that correlate with competence (Banducci et al. 2008; Lenz and Lawson 2008), as well as for judgments of dominance (Chiao et al. 2008; Little et al. 2007), sociability (Castelli et al. 2009), personal threat (Mattes et al. *in press*; Spezio et al. 2008), and other nonverbal information (Benjamin and Shapiro 2009). For example, Benjamin and Shapiro showed that participants were able to predict the outcomes of gubernatorial races from "thin slices" (Ambady and Rosenthal 1992) of nonverbal behavior, namely 10-second silent debate clips. Interestingly, when participants could listen to the debate, and hence infer the party affiliation and policy preferences of the candidates, their predictions were at chance. This provides striking evidence that nonverbal cues can outweigh verbal cues in

Table 1 Correlations of trait judgments with competence judgments, guesses of who won the election, hypothetical vote shares, and actual vote shares from Senate elections

	Competent	Guesses	Hypothetical votes	Actual votes
Competent	–	.73**	.83**	.56**
Dependable, self-disciplined	.69**	.27*	.36**	.36**
Disorganized, careless	–.69**	–.26*	–.37**	–.33**
Calm, emotionally stable	.65**	.44**	.49**	.45**
Anxious, easily upset	–.24	–.31*	–.38**	–.08
Extraverted, enthusiastic	–.19	.13	.13	–.09
Reserved, quiet	.24	–.09	–.04	.11
Open to new experience, complex	–.12	.03	.21	–.22
Conventional, uncreative	.28*	.10	–.01	.23
Sympathetic, warm	.04	.23	.35**	.01
Critical, quarrelsome	.10	–.09	–.21	.13
Honest, trustworthy	.55**	.35**	.51**	.19
Likeable	.10	.30*	.42**	.01
Factor 1 (likeability)	.04	.23	.34**	–.04
Factor 2 (reliability)	.73**	.41**	.53**	.37**

These data were collected on Senate races from 2000 to 2002. The two factors were derived from a factor analysis of the trait judgments excluding competence

* $p < .05$; ** $p < .01$

possibly determining election outcomes. In addition, this finding is consistent with Ballew and Todorov's (2007) argument that the effects of appearances on voting decisions most likely result from rapid, unreflective impressions.

To conclude, there is good evidence that rapid judgments of competence based solely on facial appearance predict election outcomes. At the level of individual judges, the accuracy of prediction is not very high: about 56% where chance is 50%. However, aggregating judgments across judges can dramatically increase predictions. For researchers interested in pursuing this line of work, the optimal sample size seems to be approximately 40 participants (Todorov et al. 2005, supplemental material). This estimate is based on bootstrap simulations showing that accuracy increases dramatically with an increase in the number of judges from 10 to 40, but negligibly with further increases in the sample size.

The Predictive Power of Facial Competence Judgments

Although the relationship between appearance-based trait inferences and voting preferences is now well established, what underlies it or how it interacts with other factors is less well understood. In our prior research, we mostly focused on establishing that inferences of competence predict election outcomes. However, these inferences are complex and we know little about their determinants. In this section, we re-analyze our most extensive data set of election judgments: The US Senate races for 2000 and 2002 (Todorov et al. 2005). The first objective of these analyses is to identify other trait inferences that co-vary with

inferences of competence. In addition to specific trait inferences, we also examine to what extent facial competence judgments correlate with attractiveness, familiarity, and facial maturity. The second objective of the analyses is to test whether correlates of perceived competence can account for its relationship with electoral success.

Competence and Other Trait Judgments from Facial Appearance

There is a general consensus among personality psychologists that personality can be explained in terms of five global factors: extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience (John and Srivastava 1999). We used trait adjectives from a validated scale of 10 pairs of traits to measure perceptions of political candidates on these five trait dimensions (Gosling et al. 2003): extraverted, enthusiastic and reserved, quiet (reversely scored) for extraversion; anxious, easily upset and calm, emotionally stable (reversely scored) for neuroticism; dependable, self-disciplined and disorganized, careless (reversely scored) for conscientiousness; sympathetic, warm and critical, quarrelsome (reversely scored) for agreeableness; and open to new experience, complex and conventional, uncreative (reversely scored) for openness to experience. Specifically, participants were presented with the pictures of the winner and the runner-up in each election, and asked to decide who was more likely to possess the respective trait (e.g., open to new experience, complex; see Todorov et al. 2005 for details of the procedures). In addition to these judgments, participants were asked to decide who was more honest, trustworthy, and likeable.

As shown in Table 1, competence judgments were highly correlated with judgments of dependability, being disorganized, emotional stability, and honesty. Not surprisingly, politicians who were perceived as more competent were also perceived as more dependable and less disorganized. They were also perceived as more emotionally stable and honest. At the same time, competence judgments were practically uncorrelated with judgments related to likeability. This pattern was confirmed in a subsequent factor analysis.

Because the trait judgments were highly correlated with each other, we conducted a factor analysis with Varimax rotation on the 12 trait judgments (see Table 1) excluding competence. The first factor accounted for 54.7% of the variance and could be described as general likeability. The three trait judgments that loaded most heavily on this factor were likeable (.96); sympathetic, warm (.95); and critical, quarrelsome (−.90). The second factor accounted for 30.5% of the variance and could be described as reliability. The four trait judgments that loaded most heavily on this factor were calm, emotionally stable (.92); dependable, self-disciplined (.83); honest, trustworthy (.81); and disorganized, careless (−.80). That is, perceptions of politicians on trait dimensions fell into two relatively independent classes: likeability and reliability. Consistent with the correlations with individual trait judgments, competence judgments were highly correlated with the reliability factor but uncorrelated with the likeability factor (Table 1).

This replicates our prior findings on a subset of these races and a different set of trait judgments (Todorov et al. 2005). Competence-related judgments from faces of politicians were relatively independent of judgments related to likeability. The findings show that people can extract information from faces that is reliably associated with inferences of competence and that these inferences are associated with a meaningful set of attributes.

Table 2 Correlations of judgments of attractiveness, baby-faced appearance, familiarity, and age (who looks older) with competence judgments, guesses of who won the election, hypothetical vote shares, and actual vote shares from Senate elections

	Competent	Guesses	Hypothetical votes	Actual votes
Attractive	.50**	.60**	.63**	.26*
Babyfaced appearance	−.38**	−.09	−.04	−.19
Familiar	.67**	.69**	.65**	.41**
Older	.26*	.29*	.08	.32*

These data were collected on Senate races from 2000 to 2002

* $p < .05$; ** $p < .01$

Competence Judgments, Attractiveness, Baby-faced Appearance, Apparent Age, and Familiarity

We also examined how competence judgments correlate with four other attributes that have been shown to be important for the evaluation of faces: attractiveness (Langlois et al. 2000), facial maturity and apparent age (Keating et al. 1999; Montepare and Zebrowitz 1998), and familiarity (Peskin and Newell 2004; Zajonc 1968; Zebrowitz et al. 2008). Judgments of attractiveness, age (who looks older?), and familiarity were already collected (Todorov et al. 2005). We collected new judgments of facial maturity because, as Zebrowitz and Montepare (2005) have argued, appearance-based competence judgments (and their relationship to voting decisions) may be driven by facial immaturity or babyfaced appearance. As with the other judgments, babyfacedness judgments were obtained by having participants ($n = 90$) provide forced-choice responses, for each election, indicating which of the two candidates appeared more babyfaced. The proportion of participants who judged a candidate to be more babyfaced (than his or her opponent) constituted that candidate's babyfacedness score.

As shown in Table 2, competence judgments were highly correlated with judgments of attractiveness and familiarity. Politicians who were perceived as more competent were also perceived as more attractive and familiar. The correlation we find between familiarity and competence connects well with recent studies by Bailenson and his colleagues (Bailenson et al. 2008), who showed that voters were more likely to vote for politicians whose faces were morphed with their own faces. In other words, voters preferred politicians who resembled them.

Consistent with prior findings showing negative correlations between babyfaced appearance and perceived competence (Montepare and Zebrowitz 1998), politicians who were perceived as more competent were also perceived as older and less babyfaced (Table 2). In fact, Zebrowitz and Montepare (2005) have suggested that this relationship can explain the finding that competence judgments predict election outcomes, i.e., babyfaced politicians are less likely to be elected than their mature-faced peers. We address this hypothesis in the next section.

Next, we conducted a regression analysis in which we regressed competence judgments on judgments of attractiveness, familiarity, age, and babyfaced appearance. These four variables accounted for 60% of the variance in competence judgments (Table 3). However, apparent age was no longer a significant predictor of perceived competence after controlling for the other judgments.

Table 3 Standardized regression coefficients of judgments of attractiveness, baby-faced appearance, familiarity, and age (who looks older) as predictors of competence judgments

Predictors	Competence judgments
Attractive	.29**
Babyfaced appearance	–.35**
Familiar	.52**
Older	–.09
Explained variance	60.2%

These data were collected on Senate races from 2000 to 2002

* $p < .05$; ** $p < .01$

Predicting Guesses of Who Won the Election, Hypothetical Votes, and Actual Election Votes

Out of the 13 personality trait judgments from the candidates' faces (see Table 1), only four significantly predicted the differences in vote shares between candidates.¹ In addition to competence judgments, these were judgments of dependability, carelessness (negatively correlated), and emotional stability. These were precisely the judgments with the highest loadings on the reliability factor, as described above. As shown in Table 2, judgments of attractiveness, age, and familiarity were also significantly correlated with differences in vote shares. In sum, the more competent, reliable, attractive, older, and familiar the politicians looked, the wider the margin of their victory was.

We also looked at the correlations with hypothetical votes, where participants were asked to cast a vote for one of the faces in each Senate pair (Todorov et al., 2005). The proportion of participants who selected a candidate constituted that candidate's simulated (or hypothetical) vote share. In addition, for the current paper, we asked participants ($n = 41$) to guess who won the election. The proportion of participants who judged a candidate to be the winner of the election constituted that candidate's election guess score. The pattern of correlations between hypothetical votes or election guesses, on one hand, and facial trait judgments, on the other, was similar to the pattern obtained for the differences in actual vote shares (Table 1). Those judgments that predicted differences in vote

¹ All variables of interest (e.g., facial competence, babyfacedness, and attractiveness) ranged between 0 and 1, and represented, for each candidate, the proportion of participants who considered that person to appear more competent, babyfaced, or physically attractive than his or her opponent (see Todorov et al. 2005). As a result, the facial judgments between opposing candidates are perfectly negatively correlated and thus fully redundant. For our analyses, we therefore selected one candidate from each election: the person whose photo happened to be presented on the right side of the survey that was administered to participants (and relative to the candidate's opponent, whose photo was presented on the left). Because candidate photo positions (right vs. left) were randomly varied across studies, our method for selecting candidates is essentially a random binary process. The differences in vote shares ranged from –1 to +1 and were computed as: (# votes for candidate on the right – # votes for candidate on the left)/(total # of votes). Scores below 0 indicate that the candidate on the left won the election. Scores above 0 indicate that the candidate on the right won the election (a score of 0 would indicate that each candidate received exactly the same number of votes). An alternative analysis, which produces similar results, is to condition the vote share differences and the face judgments on party affiliation (e.g., Democrat vote share and Democrat competence). One disadvantage of this procedure, however, is that it cannot be applied to races where one of the candidates does not belong to one of the two major U.S. parties.

shares also predicted hypothetical votes and election guesses. One interesting difference was that, whereas judgments related to likeability—likeable, trustworthy, anxious, and quarrelsome (the latter two negatively correlated with the likeability factor)—did not predict actual differences in vote shares, they did predict hypothetical votes and election guesses. This finding suggests that experiments limited to the laboratory may overestimate the role of these inferences in predicting real life outcomes.

We also found that, whereas attractiveness and familiarity significantly predicted real votes, hypothetical votes, and election guesses, babyfaced appearance was not significantly associated with any of them (Table 2). Age judgments predicted election guesses but not hypothetical votes.

Although several kinds of judgments predicted actual and hypothetical votes, these judgments were highly intercorrelated. In fact, as an inspection of Tables 1 and 2 reveals, all judgments that were significantly correlated with the actual election votes were also significantly correlated with competence judgments. To test whether judgments of attractiveness, facial maturity, familiarity, and age can account for the relationship between perceived competence and actual or hypothetical votes, we conducted a series of stepwise regression analyses, in which we first entered competence judgments, followed by one of the other four judgments. As shown in Table 4, in all models, competence was the stronger predictor of election guesses, hypothetical votes, and actual votes. In fact, for actual

Table 4 Standardized regression coefficients and additional variance explained in predictions of election guesses, hypothetical vote shares, and actual vote shares from Senate elections, in stepwise analyses that paired competence judgments (entered first) with judgments of attractiveness, baby-faced appearance, familiarity, or age (who looks older)

Regression models	Guesses	Hypothetical votes	Actual votes
Competence	.73**	.83**	.56**
Explained variance	52.8%	68.4%	30.8%
Competence and attractiveness			
Competence	.57**	.68**	.57**
Attractiveness	.32**	.28**	-.03
Additional explained variance	7.5%**	6.1%**	0.1%
Competence and babyfaced appearance			
Competence	.81**	.95**	.57**
Babyfaced appearance	.22*	.32**	.03
Additional explained variance	4.1%*	5.0%**	0.1%
Competence and familiarity			
Competence	.48**	.71**	.51**
Familiarity	.37**	.18	.07
Additional explained variance	7.7%**	1.9%	0.2%
Competence and age			
Competence	.70**	.86**	.51**
Age	.11	-.14	.19
Additional explained variance	1.1%	1.9%	3.4%

These data were collected on Senate races from 2000 to 2002

* $p < .05$; ** $p < .01$

Table 5 Standardized regression coefficients of competence judgments, factors derived from multiple trait judgments, judgments of attractiveness, baby-faced appearance, familiarity, and age (who looks older) as predictors of election guesses, hypothetical vote shares, and actual vote shares from Senate elections

Predictors	Guesses	Hypothetical votes	Actual votes
Competence	.58**	.73**	.70**
Factor 1 (likeability)	.06	.20**	-.09
Factor 2 (reliability)	-.10	.06	-.14
Attractiveness	.33**	.18*	.06
Babyfaced appearance	.29**	.24**	.23
Age	.39**	.04	.38*
Familiarity	.10	.06	-.11
Explained variance	74.4%	84.6%	38.6%

These data were collected on Senate races from 2000 to 2002

* $p < .05$; ** $p < .01$

votes, the additional variance explained by each of the four variables was negligible and non-significant. As a result, none of these variables was included in the final model. For election guesses and hypothetical votes, both attractiveness and babyfaced appearance emerged as significant positive predictors and significantly accounted for additional variance. Familiarity emerged as a significant predictor of election guesses but not hypothetical votes, suggesting that participants used this cue when guessing the winner but not when casting their hypothetical votes.

We also regressed election guesses, hypothetical votes, and actual votes on competence judgments, the two factors derived from the other trait judgments, attractiveness, familiarity, apparent age, and babyfaced appearance. As shown in Table 5, the strongest predictor in all three cases was perceived competence. In the case of actual votes, the only other significant predictor was apparent age. Older-looking politicians were more likely to win. For election guesses and hypothetical votes, attractiveness and babyfaced appearance also emerged as significant predictors.

Interestingly, babyfaced appearance emerged as a positive predictor of election guesses, actual votes, and hypothetical votes, contrary to the prediction that babyfaced politicians should be less likely to win elections (Zebrowitz and Montepare 2005). As was described in the previous section, although babyfaced appearance and facial competence were negatively correlated (Table 2), there has not been, to the best of our knowledge, direct evidence that babyfacedness and political success are negatively related in real elections. As shown in Fig. 2a, there was a weak and non-significant relationship between babyfaced appearance and differences in vote shares, in contrast to the reliable relationship between perceived competence and differences in vote shares (Fig. 2b). The latter relationship was practically unchanged after the analysis controlled for babyfaced appearance (Fig. 2c). Even when the analysis controlled for babyfaced appearance, attractiveness, familiarity, and the reliability factor derived from 12 personality trait judgments—4 predictors that accounted for almost 80% of the variance in competence judgments—perceived competence correlated significantly with differences in vote shares (Fig. 2d).

Even more surprisingly, and as noted above in the overall regression analysis, babyfaced appearance emerged as a positive predictor of differences in vote shares, although its regression coefficient did not reach significance ($p = .13$). Thus, the evidence suggests

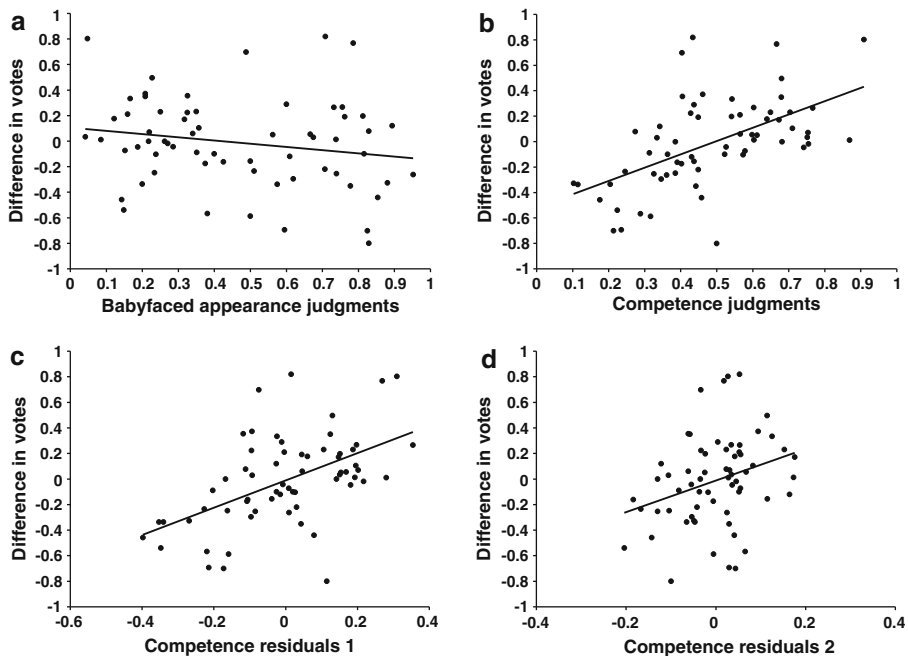


Fig. 2 Scatter plots of differences in vote shares and **a** babyfaced appearance judgments; **b** competence judgments; **c** residuals of competence judgments after controlling for shared variance with babyfaced appearance judgments; and **d** residuals of competence judgments after controlling for shared variance with judgments of babyfaced appearance, attractiveness, familiarity, and the reliability factor, which was derived from 12 personality trait judgments. Each point represents a specific Senate race. These races include elections from 2000 to 2002. The line represents the best linear fit

that, although facial competence judgments may be partly driven by babyfaced attributes, their ability to predict electoral success is largely independent of facial maturity.

Poutvaara et al. (2009) obtained very similar findings using data from 1,785 Finnish political candidates. They found that, although facial competence was negatively related to babyfacedness and positively related to electoral success, babyfacedness itself was not significantly correlated with electoral success for female candidates and it was, in fact, *positively* related to electoral success for male candidates. One potential explanation of the positive relationship between babyfaced appearance and electoral success is that babyfaced attributes signal higher approachability and voters are more likely to vote for approachable candidates. This is consistent with our findings (although see Castelli et al. 2009). Once the shared variance of perceived competence and babyfaced appearance was accounted for (see Tables 4 and 5), subjects were more likely to cast hypothetical votes for more babyfaced candidates. This finding suggests that the negative relationship between facial immaturity and facial competence (Tables 2 and 3) could have suppressed the positive relationship between babyfaced appearance and electoral success, a fascinating possibility that deserves more attention from researchers interested in the relationship between appearances and political success.

Additional indirect support for the explanation that babyfaced appearance could have a positive effect on electoral success via inferences of approachability comes from a recent study by Chiao et al. (2008), who found that judgments of approachability predicted

hypothetical votes for male candidates (see also, Johns and Shephard 2007; Shephard and Johns 2008). The hypothesis that babyfaced appearance affects voting decisions via inferences of approachability remains to be tested, however.

To summarize the correlational findings, a number of personality trait judgments, as well as general assessments of familiarity and attractiveness, correlated with both hypothetical and actual voting. Nevertheless, when these judgments were controlled for, the most reliable predictor of election outcomes was the perceived competence of the candidates. The specificity of this effect is quite remarkable: the relationship between competence judgments and differences in vote shares remained significant even after controlling for a number of variables that, together, accounted for almost 80% of the variance in these judgments (Fig. 2d). This specificity is also consistent with our finding that the degree to which various trait judgments from faces predicted election outcomes was a function of how important they were judged to be for a political representative (Hall et al. 2009).

Facial Determinants of Competence Inferences

Computer Modeling of Face Competence

Recently, Oosterhof and Todorov (2008) introduced data-driven methods for modeling variations of faces on social dimensions (see also Todorov et al. 2008). We used these methods to construct a computer model of facial competence. Specifically, Oosterhof and Todorov used a statistical model for representing face shape, in which faces are represented as points in a multi-dimensional space (Blanz and Vetter 1999, 2003; Singular Inversions 2006). This model allows for the generation of an unlimited number of faces that can be completely characterized according to these shape dimensions. To construct models of social dimensions, Oosterhof and Todorov generated a sample of 300 emotionally neutral faces and had participants rate the faces on the respective dimensions (e.g., trustworthiness and dominance). They then used the mean judgments to build vectors in the multi-dimensional shape space of the face model that were optimal in representing variations of faces on the social dimensions. These vectors are based on the correlations between the social judgments and the shape dimensions that characterize the faces. Using this procedure, we constructed a model of face competence.

We first had participants rate computer-generated faces on competence. We then used the mean competence judgments for each face to build a dimension optimal for changing face competence. The resulting model allows us to parametrically manipulate the competence of any face and, more importantly, can be used to discover some of the facial cues that people rely onto make competence judgments. Specifically, by exaggerating the faces along the competence dimension, we can study the systematic changes in facial features that increase or decrease perceived competence. After constructing the competence model, we asked a new set of participants to judge faces that varied along the competence dimension on masculinity-femininity, facial maturity, and attractiveness.

Method

Participants

Seventy-four undergraduate students participated in the studies for partial course credit. Forty-four were asked to judge the competence of 300 Caucasian computer-generated,

emotionally neutral faces. These faces were generated using *Facegen* software (facegen.com; version 3.1). The exact procedures for generating faces are described in Oosterhof and Todorov (2008). Another 30 participants were asked to judge faces that varied along the competence dimension (based on the mean competence judgments of the previous 300 faces) on attractiveness, facial maturity, and masculinity.

Procedures for Competence Judgments

Participants were told to rely on their “gut feeling” and that there is no right or wrong answer. The order of faces was randomized for each participant. Each face was presented at the center of the screen until the participant responded. A 500 ms fixation cross preceded each face. The inter-stimulus interval was 1,000 ms. The response scale ranged from 1 (*Not at all competent*) to 9 (*Extremely competent*). The mean judgments (averaged across participants) were used to find a dimension of competence in the 50-dimensional face space (Oosterhof and Todorov 2008). These judgments were reliable, Cronbach $\alpha = .84$.

Procedures for Judgments of Facial Maturity, Femininity-Masculinity, and Attractiveness

First, we generated ten random Caucasian faces (five males and five females). Then, using the competence model, we generated 5 versions of each face that varied in competence (-4 , -2 , 0 , 2 , and 4 SD on the competence dimension; see Fig. 3). This resulted in 50 faces.

Ten participants were asked to judge these faces on a 9-point scale, ranging from 1 (*baby-faced*) to 9 (*mature-faced*), ten were asked to judge the same faces on a 9-point scale, ranging from 1 (*feminine*) to 9 (*masculine*), and ten were asked to judge the faces on a 9-point scale, ranging from 1 (*unattractive*) to 9 (*attractive*). The rating procedures were the same as those used to obtain the competence ratings.

Results and Discussion

As Fig. 3 illustrates, exaggerating faces in the positive direction of the competence dimension resulted in more mature looking and attractive faces. Faces became less round, the distance between the eyebrows and the eyes decreased, the cheekbones were higher, and the jaws became more angular. Consistent with these changes, participants judged more competent faces to be more attractive and less babyfaced (Fig. 4a and 4b).

In the case of attractiveness (Fig. 4a), although the linear trend was significant, $F(1, 9) = 7.47$, $p < .023$ (i.e. attractiveness increased with the increase in competence), the quadratic trend was also significant, $F(1, 9) = 16.09$, $p < .003$. Participants' judgments were more sensitive to changes in competence at the negative than at the positive end of the dimension. In fact, the difference between judgments of 2SD and 4SD faces was not significant, $t < 1$. Female faces were judged to be more attractive, but this effect did not reach significance, $p = .20$.

In the case of facial maturity (Fig. 4b), judgments changed as a linear function of competence, $F(1, 9) = 16.69$, $p < .003$. This effect was more pronounced for male than for female faces, $F(1, 9) = 5.23$, $p < .048$, for the interaction of gender and the linear

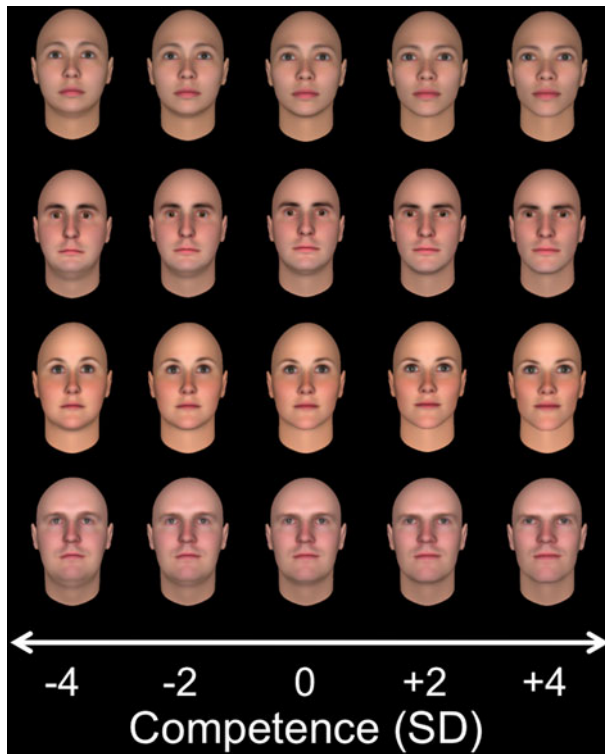


Fig. 3 Examples of faces with exaggerated competence features. The faces in the center column were randomly generated and their features were then exaggerated so as to decrease (*left two columns*) or increase (*right two columns*) their perceived competence. These changes were implemented in a computer model built upon the judged competence of 300 emotionally neutral faces

component. Not surprisingly, female faces were judged to be more babyfaced, $F(1, 9) = 74.38, p < .001$, for the main effect of gender.

Masculinity judgments were the only judgments that did not increase monotonically with facial competence (Fig. 4c). The only apparent trend was that both extremely incompetent and extremely competent faces were perceived to be more masculine, $F(1, 9) = 14.81, p < .004$. Moreover, this seemed to be primarily the case for female faces, $F(1, 9) = 5.92, p < .038$, for the interaction of gender and the quadratic component. This curvilinear trend was significant for female faces, $F(1, 9) = 14.35, p < .004$, but not for male faces, $p = .20$. As expected, there was a large main effect of gender, $F(1, 9) = 270.84, p < .001$, such that male faces were judged to be more masculine than female faces.

The differential perceptions of male and female faces on femininity/masculinity as a function of their competence is interesting with respect to the role of gender in political elections. Prior research has shown that gender affects how voters perceive political candidates (Huddy and Terkildsen 1993). Feminine facial features are typically associated with lower competence and power than their masculine counterparts, but also with greater warmth and approachability (Chiao et al. 2008; Friedman and Zebrowitz 1992;

Johns and Shephard 2007).² As a result, studies examining the relationship between appearance-based trait inferences and voting preferences have typically controlled for gender differences (e.g., by only considering elections in which candidates were matched on gender). The present findings suggest that the “appearance” bar for female politicians may be higher than for male politicians. Whereas changes in male competence did not produce equivalent changes in masculinity, extremely competent females were perceived as having more masculine features than females in the middle of the competence dimension.

Summary

Analyses of the facial judgments of political candidates, computer modeling, and prior studies (Keating et al. 1999; Montepare and Zebrowitz 1998) provide convergent evidence that babyfaced features and attractiveness both contribute to inferences of competence from facial appearance. Nevertheless, even when controlling for these variables, perceived competence emerged as a reliable predictor of election outcomes (see “[The Predictive Power of Facial Competence Judgments](#)”). More studies with diverse sets of political races are needed to test the specificity of the competence effect and to determine under what conditions other trait inferences may emerge as critical factors in voting decisions (see Hall et al. 2009; Little et al. 2007). Furthermore, experimental studies using parametric manipulations of face competence may be useful in delineating the precise features that affect hypothetical voting decisions and to ascertain how appearance cues are weighted against other, more substantive information.

Appearance Effects in the Real World

The fact that voters are influenced by candidates’ appearances (among other nonverbal cues) has a number of implications. The growing use and availability of visual media means that appearances can exert their influence through a large number of channels. Political commentators have long worried that the use of television in politics would have the adverse impact of promoting image over substance (see Lenz and Lawson 2008, for a discussion of this issue). Indeed, recent research provides compelling evidence that voters are influenced by the visual impressions that candidates project on television (Benjamin

² Poutvaara et al. (2009) found that facial competence judgments predicted electoral success for male candidates, but not for female candidates, in Finnish elections. Chiao et al. (2008) found a *negative* relationship between facial competence and electoral success for male candidates, and no relationship for female candidates, in the 2006 House of Representatives races (although they also found that facial competence positively predicted success for both genders in hypothetical elections). Using the data on U.S. Senate, House, and gubernatorial elections (see Fig. 1), we compared the predictive power of facial competence judgments in elections where one candidate was female and the other male (female-male elections) with those in which both candidates were male (male-male elections). Regressing candidates’ vote shares on their facial competence scores (separately for each election type and gender pairing, and after controlling for several other variables) revealed that, across all three political races, facial competence (positively) predicted vote share equally well for female and male candidates who faced-off against a male candidate (i.e., the regression coefficient for facial competence was positive and significant in every case, except the male-male gubernatorial elections, for which it was marginally significant). In fact, in all three types of elections, the beta coefficient for facial competence was higher for female candidates than for their male counterparts (although this difference was never statistically significant). Thus we found, contrary to Poutvaara et al. (2009) and Chiao et al. (2008), that facial competence was at least as good at predicting electoral success for female candidates as it was for male candidates. Clearly, more studies are needed to determine whether gender moderates the predictive power of facial competence.

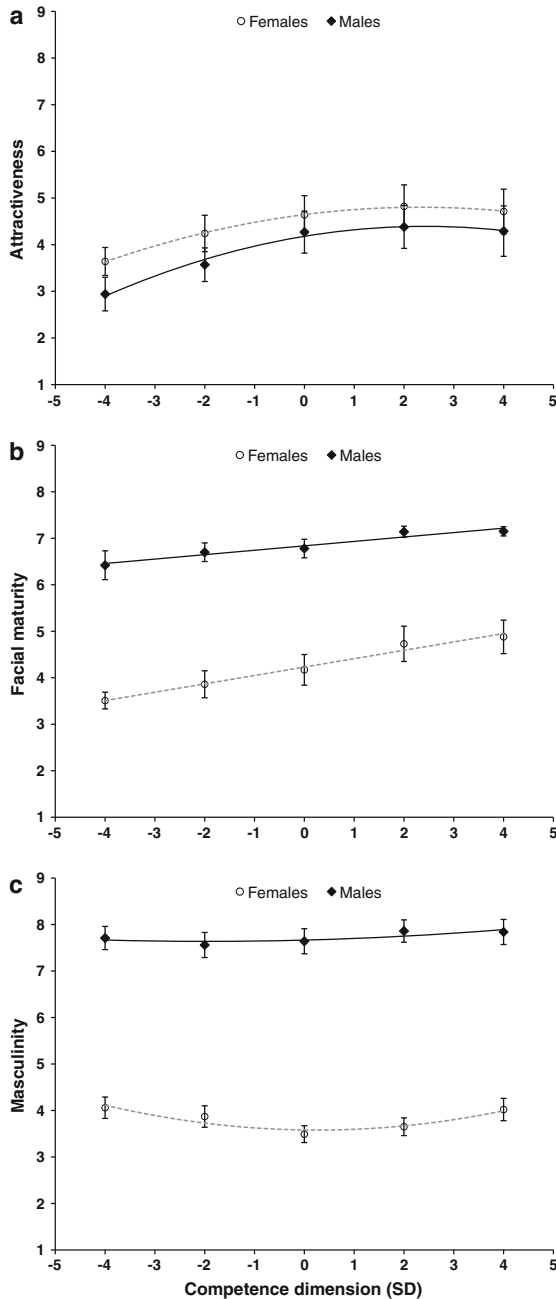


Fig. 4 Plots of changes in judgments of **a** attractiveness; **b** facial maturity; and **c** masculinity as a function of the competence and gender of faces. Attractiveness judgments were made on a 9-point scale, ranging from 1 (*unattractive*) to 9 (*attractive*). Facial maturity judgments were made on a 9-point scale, ranging from 1 (*baby-faced*) to 9 (*mature-faced*). Masculinity judgments were made on a 9-point scale, ranging from 1 (*feminine*) to 9 (*masculine*). Error bars represent the standard error of the mean. The lines represent the best linear or quadratic fits. The *x*-axis in the figures represents the extent of face exaggeration, on the competence dimension, in SD units

and Shapiro 2009; Lenz and Lawson). As was described in “[Trait Inferences in the Political Domain](#)”, Benjamin and Shapiro found that naïve participants who saw 10-second silent video clips of televised gubernatorial election debates were able to predict the winner of each race with surprising accuracy, even after controlling for a number of variables, and even for elections that were judged to be quite close (at the time of the debate). In fact, these predictions accounted for 20 percent of the two-party vote share and were comparable to incumbency status in terms of their forecasting accuracy. In contrast, participants’ ratings of candidate likability, physical attractiveness, and leadership were only weakly correlated with election outcomes, suggesting that forecasts were based on other types of information gleaned from the short clips. Similarly, Druckman (2003) experimentally recreated the exposure environment of the Kennedy-Nixon debates by having some participants listen to the debate by radio, while others were shown the televised debate. The group shown the televised debate tended to allocate more weight to personality characteristics when judging the candidates than did those who were only exposed to the radio broadcast.

Exposure to politicians’ appearances can also occur through other channels, such as campaign flyers (e.g., Rosenberg et al. 1991), newspapers, and various other political media that display static visual images. For example, studies have shown that the impressions conveyed by candidate newspaper photos impact voters’ preferences, even when more relevant information (e.g., an article about the candidate) is readily available (Barrett and Barrington 2005a). Newspapers and magazines can make strategic use of photos that convey a flattering image of the candidate who shares their political leaning, while also displaying unflattering photos of his or her opponent. In fact, there is evidence that they already do this (Barrett and Barrington 2005b; Kahn and Kenney 2002).

Finally, in a number of countries, photos of the politicians are presented on the ballots themselves. Thus voters in these countries may be particularly influenced by candidate appearances at the very moment they vote. To examine this possibility, Banducci and her colleagues (Banducci et al. 2008) had participants rate the ballot photos of 212 British candidates along six personality traits that were correlated with competence: competence, trustworthiness, leadership, qualification, experience, and “shares [the respondent’s] concerns”. They found that these personality ratings predicted electoral success, even after controlling for physical attractiveness, gender, age, ethnicity, and several other variables. Buckley et al. (2007) obtained similar results in the context of elections in the Republic of Ireland. They found that hypothetical votes based on the ballot pictures closely approximated the actual votes.

A key question that needs to be addressed by future studies is how the effect of appearance translates into the decisions of actual voters. For example, although we have amassed evidence that rapid inferences of competence from facial appearance predict election outcomes, much less is known about how these inferences impact the decisions of actual voters. It is unlikely that inferences of competence have the same effect on partisans and independent voters or on knowledgeable and unknowledgeable voters (Hall et al. 2009).

With respect to political knowledge and TV exposure, Lenz and Lawson (2008) have shown that these variables may be critical for predicting the effect of appearance on voters’ decisions. Using survey data from voters who voted in the Senate and gubernatorial elections in 2006, they were able to link competence judgments from the candidates’ faces to the voting choices of different groups of respondents as a function of their political knowledge and TV exposure (see Fig. 5). Their findings clearly indicate that the effects of appearance are much stronger for unknowledgeable voters (Figs. 5a and 5b; these graphs

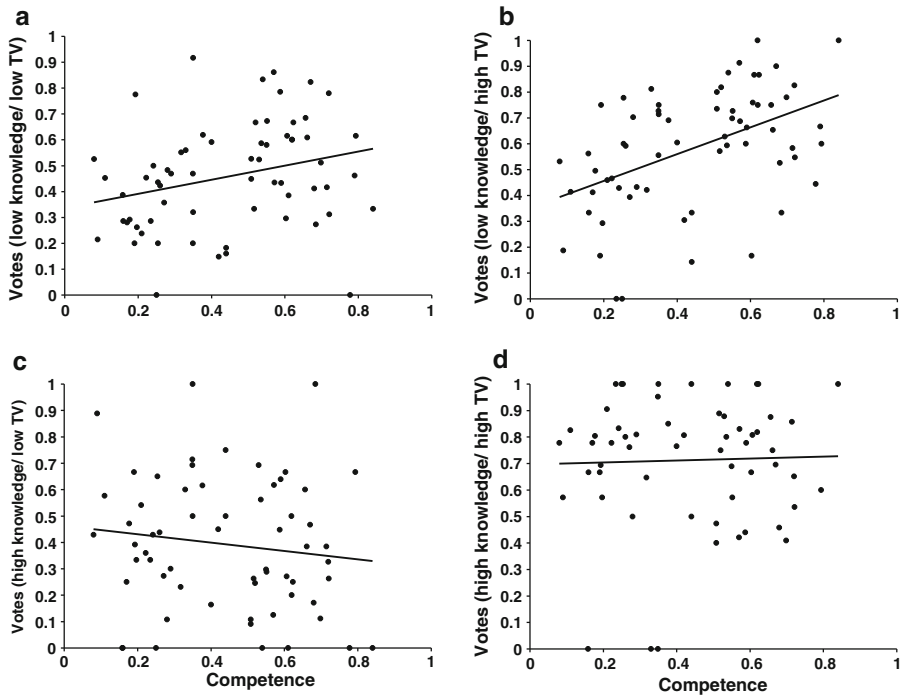


Fig. 5 Scatter plots of perceived competence of candidates and vote share as a function of voters' political knowledge and TV exposure: **a** voters with low knowledge and low TV exposure; **b** voters with low knowledge and high TV exposure; **c** voters with high knowledge and low TV exposure; **d** voters with high knowledge and high TV exposure. Each point represents either a Senate or a Gubernatorial race that occurred in 2006. The line represents the best linear fit. The data for these figures were provided by G. Lenz and C. Lawson and the figure was modeled upon relevant figures in Lenz and Lawson (2008). Vote shares and competence judgments were conditioned on party affiliation (see Footnote 1)

show the choices of the least knowledgeable voters: those in the first quartile of political knowledge). For these voters, there was a clear linear relationship between perceived competence and voting decisions. The more competent the candidate appeared to be, the more likely these voters were to vote for the candidate. In fact, there was no effect for highly knowledgeable voters (Fig. 5c, d; these graphs show the choices of the most knowledgeable voters: those in the fourth quartile of political knowledge). This latter finding is good news. However, since the seminal work of Converse (1964; see also Zaller 1992), it has been known that the majority of voters are largely ignorant about political issues.

Lenz and Lawson (2008) also found evidence that television increases the extent to which voters rely on appearances to judge candidates. As shown in Fig. 5, the strongest effect of perceived competence was on unknowledgeable voters who watched a lot of TV (Fig. 5b). That is, TV exposure exasperated the effect of low knowledge (see also Lau and Redlawsk 2001). These findings effectively rule out the possibility that more competent-looking candidates are, in fact, more competent (if this were the case, we would expect highly-informed voters to show a similar correlation between facial-competence and political choice) or that candidates who are more likely to win because of factors other than their qualifications (e.g., campaign funding) also happen to look more competent (if this

were the case, then television exposure would not moderate the effect of candidate appearances). Additional evidence for the deleterious effects of television exposure comes from the fact that appearances better predict voting in elections in which candidates receive high television coverage, such as the Senate and gubernatorial races, than in elections in which candidates receive very low television coverage, such as those for the House of Representatives (Atkinson et al. 2009; Todorov et al. 2005). Beyond appearances, we might expect Internet, television, and (in some cases) radio exposure to similarly moderate the effects of other nonverbal cues (discussed in the introduction) on voting preferences.

A Note on Differences between Static and Dynamic Facial Cues

In this paper, we focused on the predictive power of static appearance cues in politics. However, faces and other aspects of our appearance also convey much information through their movements. Indeed, there is a large and growing body of evidence that we process dynamic and static facial cues differently. For example, dynamic faces are represented more easily (Thornton and Kourtzi 2002; Yoshikawa and Sato 2006), remembered better (Lander and Bruce 2003), identified more accurately (Lander and Bruce 2000; Lander et al. 1999) and facilitate recognition of subtle emotional facial expressions (Ambadar et al. 2005; Bould and Morris 2008; Bould et al. 2008), compared to static faces. Dynamic emotional facial expressions also elicit more mimicry (Sato et al. 2008; Yoshikawa and Sato 2006) and greater arousal (Sato and Yoshikawa 2007) than static ones; in fact, dynamic and static emotional facial expressions are associated with different neural activation patterns (LaBar et al. 2003; Sato et al. 2004; Yoshikawa and Sato 2006). Observers also seem to use different standards when judging the physical attractiveness of dynamic and static faces (Lander 2008; Rubenstein 2005).

With regards to appearance-based inferences about personality characteristics, however, relatively little research has compared static and dynamic facial cues. Zebrowitz-McArthur and Montepare (1989) found that facial immaturity (i.e., structural babyfacedness) was associated with impressions of weakness for both static and dynamic faces, whereas it was only associated with impressions of warmth for static faces. They also found that the static and dynamic components of moving faces independently predicted impressions of warmth. Berry (1990) presented point-light displays of static and dynamic faces to participants and had them judge how much power (intellectual, social, and physical) they perceived each target to have. She found that perceived power was strongly related to the actual age of the target for the dynamic, but not the static, faces. Furthermore, perceived age could not account for this difference, since the relationship between objective and subjective age was similar for both dynamic and static faces. Finally, Oosterhof and Todorov (2009) recently found an interaction between dynamic facial emotions and facial trustworthiness (both dynamic and static) in people's perceptions of the emotional expressions in those faces. For example, untrustworthy-looking faces that expressed anger were perceived to be angrier than trustworthy-looking faces that expressed anger. Similarly, dynamic facial transitions from high to low trustworthiness increased the intensity of perceived anger but decreased the intensity of perceived happiness.

To the best of our knowledge, no studies have directly compared whether the relationship between facial competence and electoral success differs for dynamic and static faces. Benjamin and Shapiro (2009) did find that participants could predict the outcomes of gubernatorial elections from 10-second silent debate clips (which, of course, included dynamic facial cues), suggesting that the relationship is similar for static and dynamic faces. However, more work needs to be done. Given the growing availability of video

footage of political candidates, both on television and on the Internet, this could be a useful avenue for future research to explore.

Conclusions

First impressions based on appearances are remarkably influential, frustratingly difficult to overcome, and occur with astonishing speed. A number of studies have established that we rapidly and spontaneously draw inferences about other people's personality characteristics from their appearances (e.g., Hassin and Trope 2000; Montepare and Zebrowitz 1998; Todorov *in press*) and that these inferences can impact our decisions in a variety of important domains (e.g., Gorn et al. 2008; Olivola et al. 2009; Zebrowitz and McDonald 1991). Given that appearance-based trait inferences are influential even in domains for which we might be expected to have some amount of natural expertise, such as mate choice (Olivola et al. 2009), it is perhaps not surprising to find that they similarly exert their influence in highly complex decision making situations for which our brains are not as well equipped, such as voting.

Indeed, the literature reviewed in this paper provides strong evidence that much voting seems to be driven, at least in part, by the images that politicians project (even unwittingly). In particular, this research shows that appearance-based inferences about the personality characteristics of political candidates predict their electoral success with remarkable accuracy. This relationship between appearances and voting has been found, not only in the US, but also in a number of other countries, including Australia (Little et al. 2007; Martin 1978), Finland (Poutvaara et al. 2009), France (Antonakis and Dalgas 2009), Ireland (Buckley et al. 2007), Italy (Castelli et al. 2009), Japan (Rule et al. *in press*), Mexico (Lawson and Lenz 2007), New Zealand (Little et al. 2007), and the U.K. (Banducci et al. 2008; Little et al. 2007).

Although voters may be influenced by a variety of personality characteristics in this way, certain traits seem to emerge as the most important predictors. Traits that voters generally agree are critical in politics, such as competence and dominance, seem to account for most of the variance in the predictive power of appearances (e.g., Chiao et al. 2008; Little et al. 2007; Todorov et al. 2005). The analyses we present in this paper further show that facial competence predicts electoral success even after controlling for a number of other predictors, including some that are highly correlated with competence itself. This attests to the power and specificity of facial competence in predicting voting behavior.

One interesting question for future researchers concerns the origins of appearance-based trait inferences. In particular, what features of a person's appearance do we rely on to draw our inferences and how did this tendency evolve? In this paper we presented one approach to answering these questions, which relies on a computer model of facial personality traits to identify characteristics of the face that correlate with these trait judgments. Using this approach, we showed that judgments of facial competence are related to physical attractiveness and facial maturity. Other promising modeling approaches have also been proposed (e.g., Zebrowitz et al. 2003). The results of this modeling work suggest that many facial trait judgments may actually be overgeneralizations of judgments about more basic facial features, such as maturity and various emotional expressions (Montepare and Dobish 2003; Oosterhof and Todorov 2008; Todorov et al. 2008; Zebrowitz et al. 2003; Zebrowitz and Montepare 2008).

Although the fields of political science and public choice economics have generally assumed that voters are sophisticated and rational decision makers who cannot be swayed

by superficial cues, the literature reviewed in this paper suggests otherwise. A large and ever-growing number of studies are showing that, even when it comes to electing their leaders, people's choices are heavily influenced by superficial nonverbal cues such as appearances. While other political decision making heuristics, such as voting according to party affiliation, may be justified in terms of their efficiency and partial accuracy, it is harder to extend a similar justification to appearance-based political preferences. For one thing, evidence concerning the validity of appearances as cues for drawing inferences about others is mixed at best (Hassin and Trope 2000; Zebrowitz and Montepare 2008). Furthermore, our research indicates that even when appearance-based first impressions are somewhat accurate, this accuracy may be largely outweighed by the detrimental effects of relying too heavily on appearances while ignoring the other, more valid cues that are often accessible to us (Olivola and Todorov *in press*). Another goal of future research should therefore be to identify ways of preventing, or at least reducing, the impact of appearances on voting behavior.

However, getting people to overcome the influence of first impressions will not be an easy task. The speed, automaticity, and implicit nature of appearance-based trait inferences make them particularly hard to correct. Moreover, often people don't even recognize that they are forming judgments about others from their appearances. This explains why the actual predictive accuracy of judgments from faces is unrelated to people's confidence in their predictive accuracy (Ballew and Todorov 2007; Benjamin and Shapiro 2009). Some of the research we have examined does offer suggestions for mitigating the impact of appearances in politics. The study by Lenz and Lawson (2008), for example, suggests that exposure to television and political sophistication are both important moderators of the effects of candidate appearances. Controlling exposure to television and other media would be extremely difficult, so educating voters is likely to be a more realistic strategy.

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