

# Voting for a Male Warrior or Female Peacekeeper? Testing the Evolutionary Contingency Hypothesis in the 2016 U.S. Presidential Elections

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## Abstract

The present research replicates and extends previous literature on the evolutionary contingency hypothesis of leadership emergence. Using artificially masculinized versus feminized versions of the faces of the candidates for the 2016 U.S. presidential elections, we demonstrated that different contextual cues produced systematic variation in both preferences for and personality impressions of leadership. We describe results of an online study ( $N = 298$ ), demonstrating that followers who perceived a match between the contextual prime (*intergroup conflict or cooperation*) and a leader candidate's relevant physical cues (*masculinized or feminized versions of their faces*) both (a) preferred them as leaders and (b) rated them more positively on personality attributes commonly associated with effective leadership such as *trustworthiness, warmth, competence, and charisma*.

## Keywords

leadership preferences, facial appearance, personality attribution, evolutionary psychology, evolutionary contingency hypothesis

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The connection between facial appearance and perceptions of leadership abilities has become a major topic of interest across a range of disciplines. Facial attractiveness, for example, has been shown to play a major role in perceptions of leadership ability—possibly as a result of the “halo effect” (Zebrowitz, Hall, Murphy, & Rhodes, 2002). The influence of such snap judgments on leadership emergence has been demonstrated in numerous samples and across various contexts (see Antonakis & Eubanks, 2017; Todorov, Olivola, Dotsch, & Mende-Sidlecki, 2015). However, the outcomes of real-world political elections are determined by more than merely who is perceived to be the most attractive or intelligent candidate. Instead, they are also likely to be affected by what candidates say, the context in which they seek to lead, and how well these match up with candidates' verbal and nonverbal cues.

An evolutionary psychological perspective on leadership and followership—what we have termed the “evolutionary contingency hypothesis”—begins with the assumption that our decisions are influenced by a set of heuristics which extend far beyond a relatively simple decision rule like “follow the most attractive, or most competent leader” (Spisak, Grabo, Arvey, & Van Vugt, 2014). Instead, followers appear to be influenced by a range of heuristics that cause

them to vary systematically in their leadership preferences based on seemingly superficial physical cues such as sex, facial appearance, or body posture. The aim of the present research is to provide evidence of the external validity of this evolutionary contingency hypothesis of leadership (Van Vugt & Grabo, 2015) by making predictions about how differences in facial appearance would affect voting behavior in the “real world”—specifically during the run-up to the 2016 U.S. presidential elections.

## Theoretical Background

It has been over a decade since researchers first demonstrated that priming followers with the need for intragroup cooperation increases support for more feminine-looking leaders, while the

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threat of intergroup conflict increases preferences for more masculine-looking leaders (Little, Burris, Jones, & Roberts, 2007). Subsequent studies have continued to support the hypothesis that followers are influenced by a range of such contextual and individual cues as gender, age, and in-group versus out-group status (e.g. Laustsen & Peterson, 2017; Zebrowitz & Motepare, 2008), as well as more domain-general heuristics (e.g. individuals perceived as highly competent or attractive are more likely to emerge as leaders; Berggren Jordahl & Poutvaara, 2010; Praino, Stockemer & Ratis, 2014).

By considering the kinds of adaptive problems that would have confronted our ancestors, an evolutionary perspective has developed a set of adaptive context-dependent followership heuristics that enable us to coordinate rapidly and effectively in response to recurrent fitness-relevant challenges, based on information about both the environment and the individuals around us who would be most likely to successfully resolve such challenges (Spisak, Homan, Grabo, & Van Vugt, 2012; Van Vugt, Hogan, & Kaiser, 2008). Support for this theory comes from a large body of research which has found evidence that perceptions of leadership ability correlate with a wide range of personality assessments including attractiveness, warmth, competence, and trustworthiness (Rule & Ambady, 2008; Lawson, Lenz, Baker, & Myers, 2010; Riggio & Riggio, 2010).

However, one interesting question which has emerged from this line of research is to what extent these heuristics continue to effect voting decisions in the modern world (Antonakis & Dalgas, 2009; Jones & Cuzán, 2008; Laustsen & Peterson, 2017; Lawson et al., 2010). Recently, the underlying evolved psychological mechanism responsible for this unique ability has been conceptualized as a type of internal regulatory variable—the “leader index”—which determines both when such coordination is needed and if so, who is the best to follow (cf. Grabo & Van Vugt, 2017; Tooby & Cosmides, 2005).

In the present article, we start from the assumption that this leader index does continue to affect our voting behavior today and seek to provide further empirical evidence for that claim in two ways: first, by using the faces of the actual candidates for the 2016 U.S. presidential elections; and second, by priming participants with contextual cues revealing the kinds of issues that polls indicated truly mattered to voters at the time.

### Limitations of Previous Studies

One of the main limitations of previous research on context-specific leadership preferences is that participants are typically asked to choose between the faces of leader candidates who are either completely unknown to them or images which were entirely artificial outputs of software designed to create faces according to a predetermined algorithm (e.g., Spisak et al., 2012; Todorov, Mandisodza, Goren, & Hall, 2005). This is not to say there is something fundamentally wrong with this methodology, as there are valid reasons to begin testing the hypotheses in this way. Because our followership preferences almost certainly evolved in an environment in which leader candidates would have been well-known community members, in a sense it can be seen as the most conservative possible test of the theory. Arguably, the introduction of the

additional information conveyed by the real faces may have made the results more difficult to interpret. Given the subsequent replications of these effects, we feel it is now appropriate to investigate the extent to which these heuristics continue to operate even in the more “noisy” environments of real-world elections.

For example, the male- and female-peacekeeper hypothesis (Spisak, Dekker, Krüger, & Van Vugt, 2012: 2) suggests that voters possess an evolved heuristic that could be effectively summarized as “if at war—follow a more masculine leader, if at peace—follow a more feminine leader.” Subsequent studies have refined and expanded on this initial hypothesis by focusing on particular contextual triggers coordination challenges which increase the perceived need for leadership and the kinds of cues and signals which followers attend to when choosing the right leader for the situation (for an overview, see Van Vugt & Grabo, 2015). In the case of masculine-looking leaders, subsequent research has shown that while they may be preferred in the context of intergroup conflict, there are good theoretical reasons and increasing evidence suggesting that physical formidability or dominance can also increase leadership attributions in situations of intragroup conflict (Bøggild & Laustsen, 2016) and when negotiating with out-groups (Lukaszewski, Simmons, Anderson, & Roney, 2016).

As our understanding of the variety of evolved heuristics that contribute to leadership and followership behavior continues to expand, it is also important to test their ecological validity. In the present article, we do so by investigating both personality attributions and leadership preferences in contexts where followers possess prior information about the context of the election as well as the personality and political beliefs of the candidates themselves. Such information has been argued to create a situation of “attributional ambiguity” in which followers are influenced by two separate processes, namely, (a) *inferential* judgments about the fit between the candidate and an implicit prototype of the ideal leader and (b) *attributional* evaluations based on knowledge of past performance (e.g., the success or failures of the individual in their previous occupations or of the political party they represent; cf. Jacquart & Antonakis, 2015).

Another limitation of the design employed by the majority of the above-referenced studies is that participants are aware from the outset that their choice is either hypothetical (e.g., participants are asked to imagine they are citizens of one of the two fictional countries) or has no potential impact on their own future well-being (e.g., the faces are drawn from candidates for an election in another country, which they are not even aware of). Thus, there is reason to question whether followers in such circumstances are sufficiently motivated to carefully process information about the candidates and the potential impact of their decision as they would be when making similar decisions in the real world (though cf. Olivola & Todorov, 2010, for a review of the existing literature). Using both hypothetical scenarios and the faces of unfamiliar leader candidates puts limitations on the conclusions of previous studies. For instance, it does not allow for the possibility to test whether such effects can be moderated by the degree to which voters are informed about the candidates’ positions or the extent to which they are engaged with and participate in politics in general.

Finally, a key criticism which has been made regarding the methodology employed by previous studies on leadership and face perception concerns experimental designs which ask participants to make a forced choice between two potential leader candidates and then subsequently to rate the “winner” on a variety of attributes. It has been argued that as a result, participants may be inadvertently influenced by (a) hints this reveals about the nature of the research question and hypothesis and (b) subsequent demand effects and “common method variance,” whereby subjects simply seek to maintain consistency with their initial assessments (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

As we have mentioned above, one way in which the present study attempts to address these concerns is through the use of subtly altered versions of the candidates in the domain of real-world political elections. In addition, the experiment is designed such that participants are shown only one photograph of each candidate—that is, they are randomly assigned to either the masculinized or feminized version at each step. Consequently, the only difference between the experimental conditions was the extent to which the description of the problems that incoming President would face were written to emphasize either the need for cooperation or conflict. By pairing these prompts with high-quality artificially manipulated photographs of the candidates, we feel that the design of this study represents an important extension and confirmation of the theory and addresses several of the most commonly stated concerns and criticisms regarding the methodology typically employed in this line of research.

In summary, the aims of the present study were to investigate the generalizability of the evolutionary contingency hypothesis of leadership, to make several methodological improvements in response to subsequent criticisms, and to provide further empirical support for the claim that our evolved heuristics are still operating today. To do that, we created artificially masculinized and feminized versions of each of the actual candidates in the 2016 U.S. presidential election primaries (on the Republican side: Ben Carson, Ted Cruz, Marco Rubio, Jeb Bush, and Donald Trump; on the Democrat side: Hillary Clinton and Bernie Sanders). Second, we asked participants to indicate their preferences and personality assessments after reading a contextual prime which contained a description of the challenges facing the incoming president which was drawn from real-world challenges which polls indicated were particularly influential factors in voters’ decisions.

## Hypotheses

### *Hypothesis 1*

Consistent with the evolutionary contingency hypothesis (Van Vugt & Grabo, 2015), we predict that followers who are primed with one set of contextual factors (such as the need for intergroup cooperation) will be more likely to vote for and follow a candidate whose facial appearance (e.g., more masculine or dominant features) serves as cues of their ability to successfully coordinate a response. Such “congruent” pairings of context and cues will increase the attribution of positive personality traits related to leadership (i.e., *trustworthiness*, *warmth*, *competence*,

*attractiveness*, *dominance*, and *charisma*) and increase participants’ self-reported likelihood of voting for that candidate.

### *Hypothesis 2: Party Affiliation and Voter Knowledge*

As a series of exploratory hypotheses, we investigate the relationship between party affiliation and voter knowledge on leadership ratings and personality attributions. Previous research (Lenz & Lawson, 2011) has shown that the informed and engaged voters are less likely to rely on appearances in their evaluations, so we therefore predict that the degree to which voters are politically informed or engaged may mitigate the effects predicted in Hypothesis 1.

## Method

### *Participants and Procedure*

Participants were 298 Americans (183 males, 115 females;  $M$  age = 33.98) recruited via Amazon’s Mechanical Turk crowdsourcing platform (Amazon Mechanical Turk, 2016). All participants were of voting age, gave informed consent, and were paid for their participation. After completing the informed consent, participants were randomly assigned to either the intergroup *conflict* or *cooperation* condition. Both conditions consisted of reading a short written prompt that described several realistic political problems that would confront the incoming President. However, the details in each text were altered in order to prime the reader into either the *conflict condition*—in which the leader who would be called on to resolve problems related to intergroup conflict (e.g., competition with China, Russia, international terrorism)—or the *cooperation condition*—which stressed the importance of cooperation between nations (e.g., in fighting terrorism, trading). The text of the intergroup “conflict” scenario was as follows:

As you know, there are still several candidates currently running for president. Whoever ends up winning the presidential election will need to address several issues to ensure that our country remains a powerful player on the international stage. Here are a few of the most urgent issues facing the next president.

#### Confronting Russia and China

Most experts agree that one of the key tasks for American leadership in the near future will be to confront Vladimir Putin and put a stop to his aggressive and dangerous expansionism. Doing so will require the next President to project an image of strength, and to ensure that our military remains powerful enough to deter Putin from further intervention in the EU or the Middle East. A similar task confronts American leadership in regards to China. For example, the Council on Foreign Relations recently published a report indicating that as a result of increasing territorial disputes and China’s recent push to increase and modernize their naval forces in the region, the “risk of conflict in the South China Sea is significant,” and that capabilities being developed by the Chinese “would put U.S. forces in the region at risk in a conflict.”

#### Fighting illegal immigration

Another key task for the next president will be to protect our borders from the threat of illegal immigration. Some candidates have

suggested that without stricter border control and harsher penalties for those who have already entered the country, illegal immigration will cause serious harm to both the American culture and our economy. Without firm leadership in this area, the country could ultimately be so weakened from within that many in the middle- and lower-classes might lose both their jobs and their way of life.

#### Defeating terrorism

America is currently involved in active military intervention in Iraq, Afghanistan, and Syria. One of the great challenges for the next President will be to continue leading the global war on terrorism—identifying the leaders of organizations such as Al-Qaeda and Islamic State of Iraq and Syria (ISIS), weakening their social networks and economic infrastructure, and ultimately eradicating them before they can carry out further attacks on innocent civilians at home or abroad.

The text for the intergroup “cooperation” condition reads as follows:

As you know, there are still several candidates currently running for president. Whoever ends up winning the presidential election will need to address several issues to ensure that our country remains a powerful player on the international stage. Here are a few of the most urgent issues facing the next president.

#### Negotiating with Russia and China

Most Americans agree that one of the key tasks for American leadership in the near future will be to come to some resolution with Vladimir Putin regarding the limits of his recent political and military expansionism. To do that will require the next President to work multilaterally with not only Russia and former Soviet states, but with allies in the EU and the Middle East as well. A similar task confronts American leadership in regards to China. For example, the Council on Foreign Relations recently published a report indicating that if territorial disputes in the South China Sea are not adequately resolved, there is a significant risk that these tensions could lead to a conflict which would put U.S. forces at risk. Ultimately, the task facing the next President will be to demonstrate our willingness and ability to negotiate and act in good faith, with the aim of brokering a peaceful resolution to these long-standing disputes.

#### Reaching a consensus on illegal immigration

Another key task for the next president will be to work with Congress to craft sensible legislation addressing concerns surrounding illegal immigration. While these issues are contentious, and achieving a true consensus may prove impossible, the challenge facing our next President will be to leverage their leadership position to achieve meaningful bipartisan compromise so that concrete steps can be taken to address these concerns.

#### Reducing the spread of terrorism

One of the great challenges for the next President will be to continue leading the global war on terrorism. However, while a substantial portion of Americans support continued military intervention in Iraq, Afghanistan, and Syria, many analysts have begun to cast doubt on the idea that terrorism can ever be truly “defeated” through military means. Instead, they argue that our most important goal should be to target their ability to recruit and train new extremists. To do this, the next President must get serious about disrupting the ideological narratives being taught by extremist Imams and forced on populations with no real

alternatives. Instead, we should work with our allies to create our own training centers in Africa, Asia, Europe and North America that can counter the extremist narratives and educate at-risk populations about alternative moderate Islamic practices.

**Agreement.** As a manipulation check, participants were then asked to indicate how strongly they agreed with the description which they had just read of the problems facing the next President (on a scale of 0 = *strongly disagree* to 7 = *strongly agree*).

**Materials—morphed faces.** Participants were then told that they would be shown photos of the candidates currently running<sup>1</sup> for President of the United States and asked to rate both their leadership potential and personality (five Republicans and two Democrats; see Figure A2b in Appendix). Presentation of the seven photos was randomized to minimize any potential order effects. In each trial, participants were randomly shown either an artificially masculinized or feminized version of the candidate’s face. These faces were created from high-resolution photographs using well-validated facial morphing software and techniques (DeBruine & Tiddeman, 2017; Tiddeman & Perret, 2002). Webmorph allows researchers to transform facial images by identifying 184 points located along contours around the major facial features and altering them along specific dimensions that have been validated as relevant to social perception (Todorov, Dotsch, Porter, Oosterhof, & Falvello, 2013). In this case, sexual dimorphism was operationalized by shifting the original image either up or down the vector defined by the differences in facial morphology between a pair of “average” male and female faces (see Figure A1a and b in Appendix).

**Leadership ability.** Underneath each face participants were asked to indicate, on a 7-point Likert-type scale, “Based on your impression of the photo above, how good of a leader do you think this person would be?”

**Personality attributions.** Underneath each face, participants were asked to indicate, again on a 7-point Likert-type scale, “Based on your impression of the photo above, how strongly would you agree with the following descriptions of the person’s personality: *trustworthy, warm, competent, attractive, dominant, and charismatic.*”

**Political affiliation and demographics.** Participants were asked to report whether they were typically more likely to vote for either Republican or Democratic candidates. A third choice was included for those who had no strong preference, but these were excluded from the analysis of the effect of party affiliation on facial preference.

**Voter knowledge and engagement.** Voter knowledge and engagement was assessed via a 3-item self-report measure. Participants were asked to indicate on a 7-point Likert-type scale, with 1 indicating *less than the average voter* and 7 indicating *more than the average voter*: (1) how well informed they would rate themselves about the current primary elections, (2) how important politics were to them personally, and (3) how involved they were in politics (e.g., if they were active in local elections). For the purpose of analysis, these measures were then averaged into a composite measure which showed high internal reliability (Cronbach’s  $\alpha = .84$ ).

**Table 1.** Estimated Marginal Mean Differences in Personality Attributions Between Conflict and Cooperation Conditions by Candidate.<sup>a</sup>

Candidate	Condition	<i>n</i>	<i>M</i> Diff	SE	<i>F</i>	<i>p</i>
Ted Cruz	Cooperation	140	-2.50	2.03	0.50	.48
	Conflict	158	0.42	2.12		
Marco Rubio	Cooperation	140	0.64	1.87	0.02	.88
	Conflict	158	0.24	1.92		
Jeb Bush	Cooperation	140	-0.38	1.98	0.56	.46
	Conflict	158	1.71	1.96		
Ben Carson	Cooperation	140	-3.11	1.93	3.54	.06
	Conflict	158	1.99	1.89		
Hillary Clinton	Cooperation	140	-4.44	1.34	10.32	<.01
	Conflict	158	4.03	1.79		
Bernie Sanders	Cooperation	140	-0.24	2.00	0.10	.76
	Conflict	158	-1.08	1.85		
Donald Trump	Cooperation	140	-1.34	2.22	1.52	.22
	Conflict	158	2.48	2.14		

Note. *M* Diff = Mean Differences; SE = Standard Error.

<sup>a</sup>Negative values indicate a stronger preference for the feminized version. Positive values indicate a preference for the masculinized version.

**Demographics and debrief.** Participants were then asked to provide demographic information including their age and gender, after which they were thanked and debriefed.

### Analyses and Results

#### Hypothesis 1: The Evolutionary Contingency Hypothesis

In order to test our main prediction that followers would prefer congruent (masculine-intergroup conflict, feminine-intergroup cooperation) pairings compared to those who did not, we began by computing the difference scores in ratings of leadership ability for the masculinized and feminized versions of each candidates' face for both of the conditions (cooperation vs. competition). This was done by subtracting the ratings of feminized versions from the ratings of masculinized versions of each candidate. A positive mean difference indicated a preference for the masculinized face, while a negative indicated a preference for the feminized version. Next, we calculated the grand mean by averaging across each of these difference scores. Both the individual and average difference scores were then entered as dependent variables in a multivariate generalized linear model, with condition as the independent variable and both participant gender and party affiliation as covariates. The results indicated that, consistent with our hypothesis, when averaged across candidates participants attributed higher scores on leadership ability for the masculinized faces in the conflict condition (mean [*M*] = 1.56, standard deviation [*SD*] = 11.81) but felt the feminized versions would be better leaders in the peace condition (*M* = -1.74, *SD* = 11.15), *F*(1, 294) = 6.26, *p* = .013. The results for individual candidates and personality traits are shown in Tables 1 and 2.

We then followed a similar procedure and computed the mean differences for each of the six personality attributes commonly associated with leadership potential and then averaged these to create a final composite measure. These difference scores were entered as the dependent variables in a multivariate GLM, with condition as the independent variable. The results indicated that,

**Table 2.** Estimated Marginal Mean Differences in Personality Attributions Between Conflict and Cooperation Conditions.<sup>a</sup>

Attribute	Condition	<i>n</i>	<i>M</i> Diff	SE	<i>F</i>	<i>p</i>
Trustworthy	Cooperation	140	-1.76	0.88	6.94	<.01
	Conflict	158	1.43	0.83		
Warm	Cooperation	140	-2.10	0.87	8.64	<.01
	Conflict	158	1.42	0.82		
Competent	Cooperation	140	-1.90	0.847	8.45	<.01
	Conflict	158	1.48	0.797		
Dominant	Cooperation	140	-1.54	0.85	5.60	.02
	Conflict	158	1.24	0.80		
Charismatic	Cooperation	140	-2.04	0.86	8.47	<.01
	Conflict	158	1.40	0.81		
Attractive	Cooperation	140	0.77	1.08	3.083	.04
	Conflict	158	3.36	1.01		

Note. *M* Diff = Mean Differences; SE = Standard Error.

<sup>a</sup>Negative values indicate a preference for the feminized version. Positive values indicate a preference for the masculinized version. Controlling for gender and party affiliation.

consistent with our prediction, participants rated feminized faces as higher in this composite score of leadership-relevant personality traits in the cooperation condition (*M* = -1.87, *SD* = 9.54) but gave higher ratings to masculinized faces in the conflict condition (*M* = 1.40, *SD* = 10.30), *F*(1, 298) = 7.97, *p* < .01,  $\eta^2 = .03$ .

#### Hypothesis 2: Political Affiliation and Voter Knowledge

In order to investigate the effects of party affiliation on overall preferences for masculinized versus feminized facial appearance, a multivariate GLM was conducted, this time, including only those participants who indicated a preference for one of the two major parties. Despite the many potential interactions between participant gender, party preference, and condition on both personality attributions and leadership ability, the results indicated only one statistically significant effect—a three-way interaction specifically for Jeb Bush, *F*(1, 142) = 5.76, *p* = .018.

**Table 3.** Mean Differences in Leadership Ratings by Party Affiliation and Gender.

Condition	Gender	Political Party	<i>n</i>	Mean	Standard Deviation
Cooperation	Male	Democrat	25	-7.51	11.70
		Republican	18	-0.65	11.07
	Female	Democrat	18	1.64	13.69
		Republican	8	-4.48	11.63
Total			69	-2.98	12.43
Competition	Male	Democrat	27	2.28	12.38
		Republican	17	1.94	14.04
	Female	Democrat	30	1.96	11.64
		Republican	7	2.54	14.49
Total			81	1.90	12.43

**Table 4.** Mean Differences in Composite Personality Ratings by Party Affiliation and Gender.

Condition	Gender	Political Party	<i>n</i>	Mean	Standard Deviation
Cooperation	Male	Democrat	25	-5.01	10.24
		Republican	18	-1.19	6.33
	Female	Democrat	18	0.05	9.22
		Republican	8	-2.59	7.52
Total			69	-2.42	8.87
Competition	Male	Democrat	27	-0.42	10.94
		Republican	17	0.91	8.20
	Female	Democrat	30	2.58	9.72
		Republican	7	-1.91	8.73
Total			81	0.84	9.73

However, it is difficult to interpret this as meaningful support for our hypothesis, given the overall trends shown in Tables 3 and 4.

In order to test whether the above effects would be attenuated when including a measure of voter knowledge and engagement, we created an average of participants' self-ratings on the three self-report items measuring knowledge, importance, and engagement. We then conducted a linear regression with political knowledge as independent and the composite personality difference measure as the dependent measure. Results indicated that, overall, political knowledge was negatively associated with differences in personality ratings ( $B = -.07$ , standard error = .45,  $t = -1.22$ ,  $p = .22$ ), meaning that voters with greater political knowledge seemed less affected by the face manipulations of masculinity versus femininity, though this effect was not at the level of statistical significance. However, the fact that this measure was negatively associated with each of the personality ratings (see Table 5) suggests it may be worth exploring more thoroughly in subsequent studies.

## Discussion

The present study sought to replicate and extend previous research on the influence of facial appearance on voting decisions. After being primed with a text emphasizing the need for either intergroup conflict or cooperation, we found that participants differentially attributed personality traits to artificially masculinized or feminized photographs of the candidates for the 2016 U.S. presidential

**Table 5.** Results of a Linear Regression With the Composite Self-Report Rating of How Politically Informed as Independent Variable and Mean Difference in Personality Ratings as Dependent.<sup>a</sup>

Mean Difference	<i>B</i>	<i>t</i>	<i>p</i>
Trustworthy	-.63	-1.35	.18
Warm	-.58	-1.26	.21
Competent	-.59	-1.32	.19
Dominant	-.58	-1.29	.20
Charismatic	-.34	-0.75	.46
Combined	-.55	-1.22	.22

<sup>a</sup>A negative relationship therefore indicates smaller differences resulting from the experimental manipulation (i.e., the effect of facial masculinity vs. femininity).

elections. These findings provide further empirical support for the evolutionary contingency hypothesis of leadership. They suggest that followership heuristics based on facial cues can still affect leadership and personality attributions, even in real-world elections today, where voters are involved and have some information about the candidates. In addition, we find further evidence for a relationship between party affiliation (Republican vs. Democrat) and preferences for more masculine leaders. Contrary to our prediction, however, this effect was not significantly diminished for participants who were particularly well-informed or involved in politics, though there was an overall negative trend that could merit further research.

## Strengths and Weaknesses

The design of this study was an attempt to address some of the limitations of previous methodologies—for example, by asking participants to rate only one version of each face rather than make a forced-choice decision between multiple-pair leader candidates. We would recommend that future studies include not just two artificially manipulated faces but also a control group where participants are shown the original image either with or without the context prime in order to establish a baseline.

Our study made use of a written prompt that was created in collaboration with a group of political scientists to ensure that it reflected realistic concerns. However, we did not explicitly ask participants about the degree to which they perceived them as emphasizing conflict or cooperation—something which could have been measured more extensively through pilot studies. It also incorporated several important determinants of personality and leadership attribution such as the participants' own political orientation and engagement. However, the 3-item self-report scale of political knowledge and engagement could be expanded if their primary aim is to investigate this particular relationship.

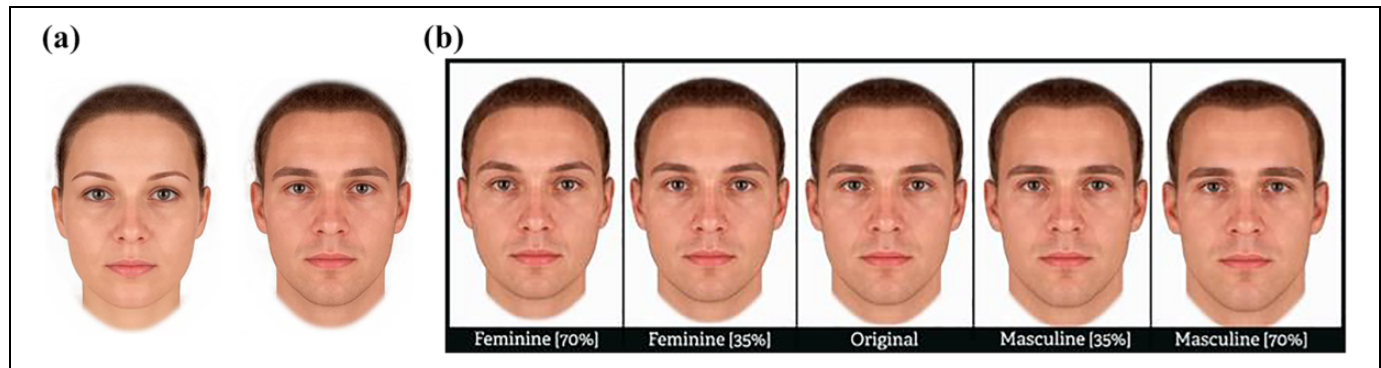
## Future Studies

The present study focused on the impact of facial masculinity and femininity in the context of conflict versus cooperation—but this is by no means the only adaptive problems which leadership has evolved to help resolve. Future studies should continue to investigate the impact of facial features such as warmth, trustworthiness, and competence in domains such as resource scarcity and pathogen concerns.

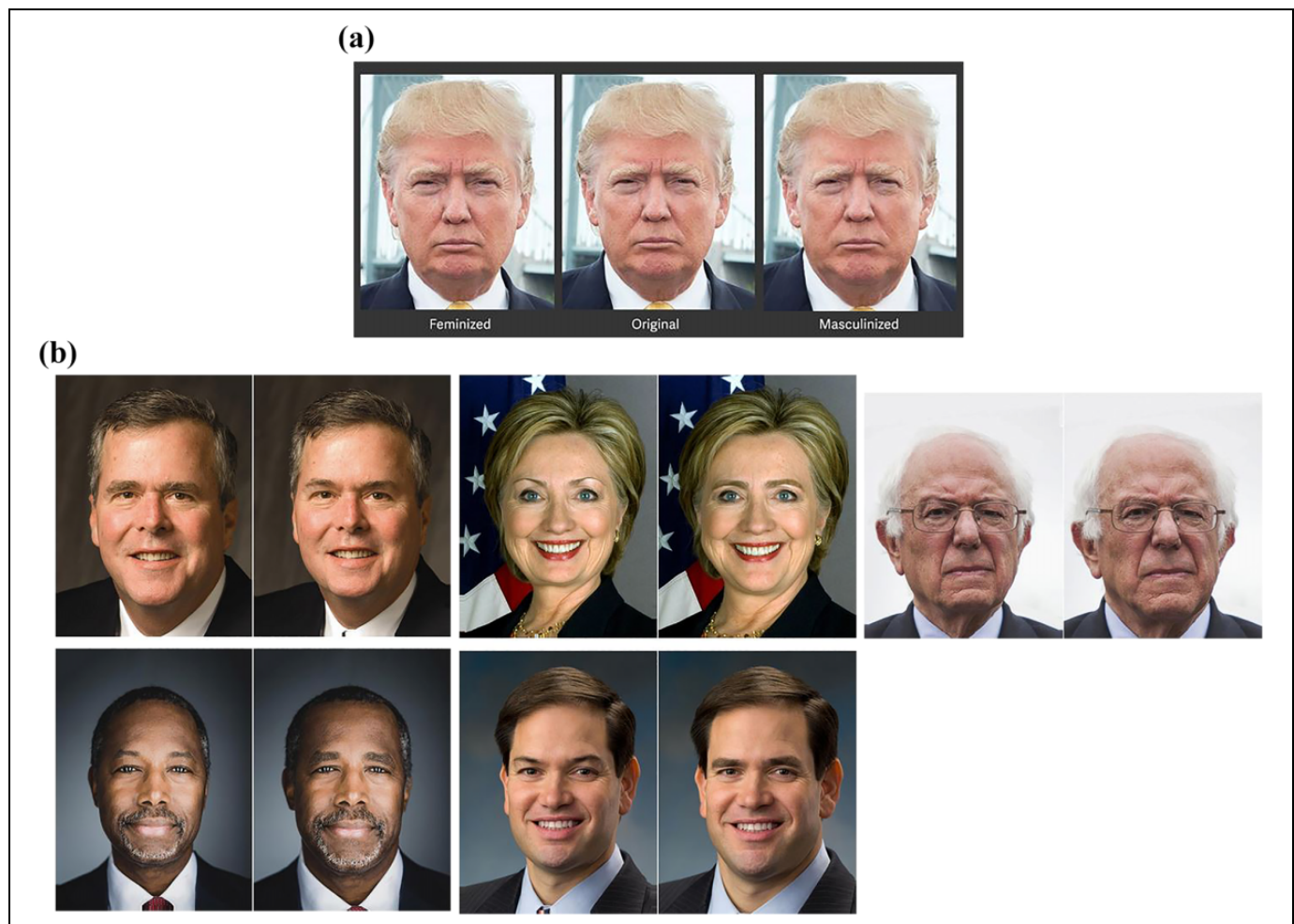
The development of a more reliable and objective instrument for assessing voters’ overall political knowledge would also be an immensely useful tool—though it would need to be continually updated to reflect the platforms of the candidate’s currently running for office. Future research could aim to develop a more comprehensive measure that includes true or false questions about the candidates’ personalities and political platforms.

Finally, although the results of this study did not indicate significant interactions between gender and either personality attributions or voting preferences, there remains much more to be discovered about this relationship, and we would encourage researchers interested in this interaction to make use of both male and female leaders and followers in order to advance our understanding in this often-overlooked area.

**Appendix**



**Figure A1.** (a) “Average” male and female faces used to alter candidates along the dimension of sexual dimorphism. (b) An example of transforming an average face from low to high masculinity.



**Figure A2.** (a) Demonstration of the difference between the original, masculinized, and feminized version of Donald Trump. (b) Faces of the rest of the candidates for the 2016 U.S. presidential election with masculinized versions presented on the right, feminized on the left.

## Authors' Note

A.G. and M.V.V. conceived the basic idea. A.G. wrote the first draft. M.V.V. commented on drafts.

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## Note

1. As of February 19, 2016, when the study was run, this included Ben Carson, Ted Cruz, Marco Rubio, Jeb Bush, Hillary Clinton, Bernie Sanders, and Donald Trump.

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