

Title:

THE FACES OF LEADERS: SEXUAL DIMORPHISM, PERCEIVED TRAITS,
AND VOTING IN CONTEXT

Running head:

Leadership in faces

Key words:

Leadership, dominance, vote, masculinity/femininity, war-time/peace-time

Authors and Affiliation:

Anthony C. Little¹, S. Craig Roberts¹, Benedict C. Jones², & Robert P. Burriss¹

¹*British Academy Centenary Project, School of Biological Sciences, University of Liverpool*

²*School of Psychology, University of Aberdeen*

For correspondence:

Anthony C. Little,
School of Biological Sciences,
University of Liverpool,
Crown Street, Liverpool
L69 7ZB, U.K.

Telephone no: +44 (0)151 795 4516

Fax: +44 (0)151 795 4408

Email: a.c.little@liverpool.ac.uk

Words in abstract: 223

Total word count: 3232 (inc abstract, references, & figure legends)

1 **VOTING AT FACE VALUE: FACIAL CHARACTERISTICS, PERCEIVED**
2 **TRAITS, AND VOTING IN CONTEXT**

3

4 Human groups are unusual among primates in that our leaders are often
5 democratically selected. Many social judgements are made using only facial
6 information and here we examined the potential influence of facial perceptions
7 on leadership elections. We address this possibility using a case study of the
8 2004 US presidential candidates George Bush and John Kerry. We removed
9 recognition effects by applying the difference between their faces to a neutral,
10 unfamiliar face, and then measured how the difference in their facial
11 physiognomies influenced attributions and hypothetical voting decisions. The
12 'plus-Bush' and 'plus-Kerry' faces were seen to possess different but
13 potentially valued leadership traits. For voting, preference for face version was
14 context-dependent. Raters preferred the plus-Bush face as a war-time leader
15 and the plus-Kerry face as a peace-time leader. We also examined voting to
16 computer graphic manipulations of masculinity showing that masculine faces
17 were voted for more in war-time and feminine faces in peace-time contexts,
18 suggesting that attitudes to sexual dimorphism in faces play an important role
19 in voting decisions. Both findings demonstrate that voter's attitudes to the
20 physical appearance of politicians may interact with their perceptions of the
21 current political climate to determine voting behaviour. Such flexible
22 leadership choice may reflect the selection of leaders who are most beneficial
23 to the individuals of a group at a particular time or in a particular situation.
24

25 **Introduction**

26 Leaders are ubiquitous in human populations and potentially leadership
27 choice has a biological as well as a social basis. Attractiveness may signal
28 quality (Thornhill & Gangestad 1999) and is associated with a variety of
29 positive personality attributions (Eagly et al. 1991). Attractiveness then is a
30 trait likely to be valued in potential leaders. Many studies demonstrate
31 agreement on judgements of facial attractiveness and personality (Perrett et
32 al. 1998; Zebrowitz 1997), and there is evidence that attractive individuals are
33 more likely to be hired for jobs than less attractive individuals (Chiu & Babcock
34 2002; Marlowe et al. 1996). It has also been speculated that facial
35 appearance may influence voting decisions in elections since the famous
36 televised debates of Kennedy and Nixon. In one debate, those with visual
37 information, from television, thought that Kennedy had won the debate, while
38 those with only auditory information, from radio, thought that Nixon had won
39 (Kraus 1988). This implies that regardless of policy and good argument, visual
40 appearance has a striking effect on what individuals think about politicians. In
41 line with many positive attributions to attractive individuals, studies show that
42 attractive individuals are more likely to receive votes than unattractive
43 individuals (Budesheim & Depaola 1994).

44 A major aspect of facial appearance potentially associated with
45 leadership is facial dominance. The expression and physiognomic features
46 associated with dominance are agreed upon cross-culturally (Keating et al.
47 1981a; Keating et al. 1981b). Dominant appearance appears to influence
48 occupational status in certain settings. Facial dominance of the graduates
49 from the West Point Military Academy in 1950 predicted their final rank at the

50 end of their careers (Mueller & Mazur 1996; Mueller & Mazur 1997). Facial
51 masculinity, linked to facial dominance (Perrett et al. 1998), positively relates
52 to testosterone level (Penton-Voak & Chen 2004), suggesting a link to actual
53 dominant behaviour (Mazur & Booth 1998) in dominant faced individuals.
54 Unlike attractiveness, dominance may not be a valued trait in leaders. Facial
55 dominance may be linked to leadership status due to acquiescent or
56 submissive responses by other group members rather than by group assent.
57 In fact masculine faces, as well as looking dominant, also appear
58 untrustworthy (Perrett et al. 1998). Many primate societies are characterised
59 by strict hierarchies in which physical dominance is a prominent determinant
60 (Smuts et al. 1987). Humans, however, are somewhat unusual in that many
61 societies choose their leaders democratically, leaving the potential to select
62 individuals with pro-social skills over more physically dominant individuals. It is
63 difficult to then to predict whether dominance will be favoured in leader choice.

64 It has recently been demonstrated that, in a large sample of head shot
65 images of politicians, ratings of competence are related to the outcome of
66 actual US congressional elections (Todorov et al. 2005). This finding links
67 physical appearance from photographs to election outcome (Martin 1978), but
68 included information from facial expression, clothing and posture, as well as
69 facial appearance and shape. Further to these studies, while it is likely that
70 competence is important in almost all leadership decisions, it is possible that
71 different faces hold different valued traits that may be more or less important
72 according to current circumstances. Such context-dependent variability in
73 choice is a common feature in other human preference research (Little et al.
74 2001; Little et al. 2002a; Little et al. 2002b).

75 Here we examine attributions of attractiveness, dominance and
76 personality, as well as hypothetical voting in different contexts based on the
77 facial features of George Bush and John Kerry because these prominent
78 individuals publically argued over their suitability to lead in a time of war
79 during their election campaigns. One significant problem in studying the facial
80 appearance of famous figures is recognition. Once a perceiver recognises an
81 individual they may use previously acquired information in their judgements.
82 To remove recognition of the candidate as a factor in the judgements, the
83 difference in shape between Bush's and Kerry's face was applied to a neutral
84 face image (Tiddeman et al. 2001) creating a face exaggerating Bush's
85 features as they differ from Kerry's and a face exaggerating Kerry's features
86 as they differ from Bush's (Figure 1, methods). The transformed images thus
87 held the features that differentiate the two candidate's faces but did not
88 contain specific cues to their identities. Facial masculinity, because of its link
89 to dominance, was also examined in terms of voting for leaders. In contrast to
90 previous studies described above, our stimuli control for extraneous factors
91 such clothing and expression, restricting any influence on 'voter' perception to
92 differences in facial shape only.

93 We asked two groups of participants to make forced-choice decisions
94 for either physical and personality judgements or hypothetical voting for the
95 Bush/Kerry images. Previous studies have shown that masculinity in faces is
96 associated with personality attributions, masculine faces are seen as more
97 masculine and dominant but less co-operative and less attractive than
98 feminine faces (Perrett et al., 1998), and so we examined only voting to
99 masculine/feminine faces.

100

101 **Methods**102 **Participants** – 57 individuals (45 female, 12 male, aged 18-41, mean = 21.7,

103 SD = 4.6) made forced-choice decisions for the physical and personality

104 judgements. 101 different individuals (69 female, 32 male, aged 18-30, mean

105 = 21.0, SD = 2.3) made forced-choice decisions for the voting judgements.

106 Data was collected in October 2004, prior to the US election. A third sample of

107 91 individuals (44 female, 47 male, aged 18-40, mean = 21.8, SD = 3.9) made

108 forced-choice decisions for the voting judgements for the masculine/feminine

109 faces.

110

111 **Stimuli** - Two face images were presented to participants for judgements of

112 Bush vs. Kerry (Figure 1). A single composite of a young male (10 images,

113 taken under standardised lighting and with a neutral expression) was

114 transformed in shape only using the linear difference between a composite of

115 George Bush and a composite of John Kerry (5 images each, Figure 1).

116 Transformations were based on 50% of the difference between the Bush and

117 Kerry composites. Composites were made by marking a number of landmark

118 features, calculating an average shape for each and warping each constituent

119 image to the average before blending the images together into a single image.

120 Masculine/feminine images were made in the same way but using the same

121 composite base image but transforming +/- 50% based on the difference

122 between a composite of 50 male faces and a composite of 50 female faces

123 (Figure 1, see Perrett et al., 1998). All composites were made symmetric

124 before any manipulations. Transforming and composite creation used

125 specially designed software (Perception Laboratory, University of St Andrews,
126 see (Tiddeman et al. 2001).

127

128 **Figure 1 about here**

129

130 **Procedure** - Participants filled in a short questionnaire assessing their age
131 and sex. The face pairs were then presented via a java applet randomising
132 the side on which the images were presented. On each trial clicking a button
133 below the image indicated the raters' choice based on a particular trait and
134 moved the program onto the next trial. Participants made seven physical and
135 personality judgements in response to the on-screen prompt "Please indicate
136 which face you think looks most X by clicking below", where X was replaced
137 by adjectives offered in the following order: attractive, masculine, dominant,
138 strong leader, likable, forgiving, intelligent. The second and third set of
139 participants "voted" in response to the on-screen question "Please indicate
140 which face you would vote for to run your country" and then twice more in
141 response to the same question followed by "in a time of war" or "in a time of
142 peace" for either the Bush/Kerry or masculine/feminine faces.

143

144 **Results**

145 Choice of face was analysed with one-way chi square tests (DF=1). The 'plus-
146 Bush' (anti-Kerry) face was seen as more masculine (65%/35%, $\chi^2 = 5.1$, $p =$
147 .024) and dominant (63%/37%, $\chi^2 = 3.9$, $p = .047$) than the 'plus-Kerry' (anti-
148 Bush) face, while the plus-Kerry face was seen as more attractive (79%/21%,
149 $\chi^2 = 19.1$, $p < .001$), forgiving (82%/18%, $\chi^2 = 24.0$, $p < .001$), likable

150 (75%/25%, $\chi^2 = 14.8$, $p = .024$) and intelligent (67%/33%, $\chi^2 = 6.3$, $p = .012$)
151 than the plus-Bush face. The plus-Bush face was selected by more individuals
152 as a strong leader (58%/42%, $\chi^2 = 1.4$, $p = .23$) though this was not
153 significant. Age was not correlated with any of the choices (all $p > .27$) and
154 independent samples t-tests revealed no difference between male and female
155 raters for the scores (all $p > .18$).

156

157 The plus-Bush face was selected by more individuals as the face they
158 would vote for to run their country (56%/44%, $\chi^2 = 1.7$, $p = .20$) than the plus-
159 Kerry face. While not significant here, such trends could help win elections if
160 they hold for real voting. The faces were differently voted for according to war-
161 or peace-time leadership. The plus-Bush face was 'voted' for most when
162 voting in a time of war (74%/26%, $\chi^2 = 23.8$, $p < .001$) and the plus-Kerry face
163 was voted for most when voting in a time of peace (61%/39%, $\chi^2 = 15.1$, $p <$
164 $.001$, Figure 2). Age was not correlated with any of the voting choices (all $p >$
165 $.43$) and independent samples t-tests revealed no difference between male
166 and female raters for voting scores (all $p > .41$).

167

168 **Figure 2 about here**

169

170 Voting for the masculine versus feminine face revealed that there was
171 no significant difference when individuals were asked to vote for an individual
172 to run their country (51%/49%, $\chi^2 = 0.1$, $p = .92$). The faces were, like the
173 Bush/Kerry faces, differently voted for according to war- or peace-time
174 leadership. The masculine face was 'voted' for most when voting in a time of

175 war (64%/36%, $\chi^2 = 6.9$, $p = .003$) and the feminine face was voted for most
176 when voting in a time of peace (60%/40%, $\chi^2 = 4.0$, $p = .046$, Figure 3). Age
177 was not correlated with any of the voting choices (all $p > .42$) and independent
178 samples t-tests revealed no difference between male and female raters for
179 voting scores (all $p > .13$).

180

181 **Discussion**

182 Caricaturing a face along a Bush-Kerry dimension revealed different
183 perceptions in terms of physical appearance, personality and hypothetical
184 voting behaviour. The faces of the two appear well matched when it comes to
185 a general vote and this may reflect that Bush and Kerry's faces each hold
186 different aspects that would be valued in a leader – dominance for Bush and
187 likeability/intelligence for Kerry. Attractiveness cannot be the sole determinant
188 of perceived leadership ability in these faces as the plus-Bush face was more
189 likely voted for in a time of war despite being judged of lower attractiveness (it
190 also received a higher percentage choice in a straight vote, though not
191 significantly). Although we acknowledge that voting decisions are dependent
192 on many other factors than the candidate's faces, the findings are also
193 surprisingly consistent with the outcome of the real voting in the 2004 election.
194 The final polling revealed, from a 99% return for the two candidates, that Bush
195 had 51% and Kerry had 48% of votes, very similar to the 56/44% split here
196 when judges were asked which face they would vote for as the leader of their
197 country. This result is inline with Todorov et al. (2005) who show a link
198 between hypothetical votes to images and real voting.

199 The association between perceived dominance and masculine faces
200 (Perrett et al., 1998) is somewhat similar to the association of masculinity and
201 dominance and the plus-Bush face. Likewise the pro-social perceptions of
202 feminine faces resemble the feminine and pro-social attributions to the plus-
203 Kerry face. Potentially it is the masculine/dominant versus feminine/prosocial
204 difference between Bush and Kerry's features that mean masculinised faces
205 are voted for in the same way as the Bush face and femininised faces voted
206 for in the same way as the Kerry face in the different voting contexts. While
207 neither masculinity nor femininity was favoured in a straight forward vote, the
208 masculine face was voted for more in the war-time context and the feminine
209 face was voted for more in the peace-time context.

210 Our results then show that judges have conditional values for the faces
211 of leaders which vary with current circumstances: the dominant features of
212 Bush and masculine faces were favoured in a leader during "war-time", while
213 the more forgiving features of Kerry and feminine faces were favoured in a
214 leader in "peace-time". Preferring a likable, forgiving leader may be expected
215 because traits, such as altruism, trust, and modesty are generally valued
216 characteristics in others (Hampson et al. 1987). In a time of peace, these pro-
217 social attributes may be more beneficial to the group or society and so are of
218 increased value in a leader. However, these same features may not be
219 favoured in a time of war as the possessor may be perceived as being more
220 likely to lose out to more aggressive competitors (Kyl-Heku & Buss 1996). In
221 the context of leadership during a time of war, dominant masculine features
222 may signal that the individual may be better able to stand up for and protect
223 the group or society, while. Facultative choice of leader according to who may

224 be most useful for a particular situation or context may reflect an adaptation
 225 within human social groups, which could potentially benefit the other
 226 individuals in a group.

227 The change in voting for facial shapes according to war or peace
 228 context suggests that an individual's perception of the state of world politics
 229 and current events might strongly influence his or her choice of leader.
 230 Individuals appear to take into account environmental or situational cues, such
 231 as the current political climate that we vary here, and select the best
 232 candidate accordingly. Interestingly, our results suggest the potential for
 233 candidates for leadership positions to promote themselves as a good leader,
 234 and thus win votes, by influencing or manipulating their group's/electorate's
 235 perception of the current climate or situation in such a way as to be consistent
 236 with the particular strengths associated with their facial characteristics and
 237 other aspects of their physical appearance. Our results also highlight flexibility
 238 of leadership choice in a way that could be regarded as adaptive.

239

240 **References**

241

- 242 Budesheim, T. L. & Depaola, S. J. 1994 Beauty or the beast - the effects of
 243 appearance, personality, and issue information on evaluations of political
 244 candidates. *Personality and Social Psychology Bulletin* **20**, 339-348.
 245 Chiu, R. K. & Babcock, R. D. 2002 The relative importance of facial attractiveness
 246 and gender in Hong Kong selection decisions. *International Journal of Human*
 247 *Resource Management* **13**, 141-155.
 248 Eagly, A. H., Ashmore, R. D., Makhijani, M. G. & Longo, L. C. 1991 What is
 249 beautiful is good, but ...: A meta-analytic review of research on the physical
 250 attractiveness stereotype. *Psychological Bulletin* **110**, 109-128.
 251 Hampson, S. E., Goldberg, L. R. & John, O. P. 1987 Category-breadth and social-
 252 desirability values for 573 personality terms. **1**.
 253 Keating, C., Mazur, A. & Segall, M. 1981a Culture and the perception of social
 254 dominance from facial expression. *Journal of Personality and Social*
 255 *Psychology* **40**, 615-626.
 256 Keating, C. F., Mazur, A. & Segall, M. H. 1981b A cross-cultural exploration of
 257 physiognomic traits of dominance and happiness. *Ethology and Sociobiology*
 258 **2**, 41-48.

- 259 Kraus, S. 1988 *Televised presidential debates and public policy*. Hillsdale, NJ:
 260 Lawrence Erlbaum Associates.
- 261 Kyl-Heku, L. M. & Buss, D. M. 1996 Tactics as units of analysis in personality
 262 psychology: An illustration using tactics of hierarchy negotiation. *Personality*
 263 *and Individual Differences* **21**, 497-517.
- 264 Little, A. C., Burt, D. M., Penton-Voak, I. S. & Perrett, D. I. 2001 Self-perceived
 265 attractiveness influences human female preferences for sexual dimorphism and
 266 symmetry in male faces. *Proceedings of the Royal Society of London, B* **268**,
 267 39-44.
- 268 Little, A. C., Jones, B. C., Penton-Voak, I. S., Burt, D. M. & Perrett, D. I. 2002a
 269 Partnership status and the temporal context of relationships influence human
 270 female preferences for sexual dimorphism in male face shape. *Proceedings of*
 271 *the Royal Society of London, B* **269**, 1095-1100.
- 272 Little, A. C., Penton-Voak, I. S., Burt, D. M. & Perrett, D. I. 2002b Individual
 273 differences in the perception of attractiveness: How cyclic hormonal changes
 274 and self-perceived attractiveness influence female preferences for male faces.
 275 In *Advances in Social Cognition: Facial Attractiveness*, vol. 1 (ed. G. Rhodes
 276 & L. Zebrowitz), pp. 59-90. Westport, CT: Ablex.
- 277 Marlowe, C. M., Schneider, S. L. & Nelson, C. E. 1996 Gender and attractiveness
 278 biases in hiring decisions: Are more experienced managers less biased?
 279 *Journal of Applied Psychology* **81**, 11-21.
- 280 Martin, D. S. 1978 Person perception and real-life electoral behavior. *Australian*
 281 *Journal of Psychology* **30**, 255.
- 282 Mazur, A. & Booth, A. 1998 Testosterone and dominance in men. *Behavioural and*
 283 *Brain Sciences* **21**, 353-371.
- 284 Mueller, U. & Mazur, A. 1996 Facial dominance of West Point cadets as a predictor
 285 of later military rank. *Social Forces* **74**, 823-850.
- 286 Mueller, U. & Mazur, A. 1997 Facial dominance in Homo sapiens as honest
 287 signalling of male quality. *Behavioral Ecology* **8**, 569-579.
- 288 Penton-Voak, I. S. & Chen, J. Y. 2004 High salivary testosterone is linked to
 289 masculine male facial appearance in humans. *Evolution and Human Behavior*
 290 **25**, 229-241.
- 291 Perrett, D. I., Lee, K. J., Penton-Voak, I. S., Rowland, D. R., Yoshikawa, S., Burt, D.
 292 M., Henzi, S. P., Castles, D. L. & Akamatsu, S. 1998 Effects of sexual
 293 dimorphism on facial attractiveness. *Nature* **394**, 884-887.
- 294 Smuts, B. B., Cheney, D. L., Seyfarth R.M., Wrangham, R. W. & Struhsaker, T. T.
 295 (ed.) 1987 *Primate Societies*. Chicago: University of Chicago Press.
- 296 Thornhill, R. & Gangestad, S. W. 1999 Facial attractiveness. *Trends in Cognitive*
 297 *Sciences* **3**, 452-460.
- 298 Tiddeman, B. P., Burt, D. M. & Perrett, D. I. 2001 Prototyping and transforming
 299 facial texture for perception research. *IEEE Computer Graphics and*
 300 *Applications* **21**, 42-50.
- 301 Todorov, A., Mandisodza, A. N., Goren, A. & Hall, C. C. 2005 Inferences of
 302 competence from faces predict election outcomes. *Science* **308**, 1623-1626.
- 303 Zebrowitz, L. A. 1997 *Reading faces*. Boulder CO: WestviewPress.

Figure 1: Transformed composites representing transforms of Bush vs Kerry (Plus-Bush/Anti-Kerry, A, Plus-Kerry/Anti-Bush, B), original composites of Bush (C) and Kerry (D) used to make the transform, and masculinised (E) and feminised (F) faces.

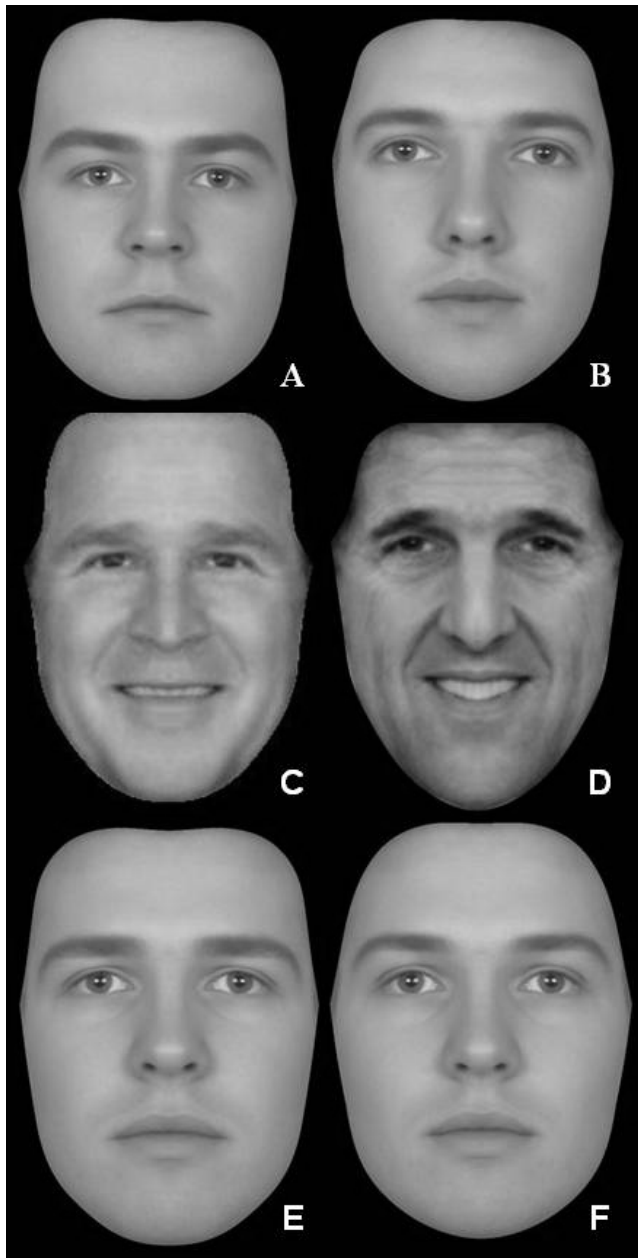


Figure 2: Proportion of 'votes' for "plus-Bush" and "plus-Kerry" (A) and masculine and feminine (B) transformations by scenario

