

1 **THE EVOLUTIONARY PSYCHOLOGY OF LEADERSHIP TRAIT PERCEPTION**

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5 Many researchers now approach the understanding of how facial characteristics  
6 shape the perception of leadership ability through the lens of human evolution.  
7 Evolutionary psychology considers what skills and characteristics would have been  
8 valuable for leaders to possess in our evolutionary history, including dominance,  
9 masculinity and trustworthiness. Moreover, it gives an understanding about why rapid  
10 categorisation of these social cues from faces is adaptive. In this chapter, I present  
11 evolutionary arguments for social inferences based on faces, and discuss how our  
12 understanding of this categorisation has shifted away from purely associative  
13 phenomena toward evolved, innate processes. I explain how the perception of  
14 leadership ability in faces is linked to variance in facial morphology, and how these  
15 morphologies tell us something about the individuals who carry them. Specific facial  
16 cues relating to leadership-relevant traits are discussed, as well as the underlying  
17 biological systems that accompany these traits. I also explain the importance of  
18 context and individual differences on the prioritisation of seemingly disparate facial  
19 cues to leadership: dominance and trustworthiness. I also discuss recent findings in  
20 this area which further extend these concepts to examine cues to leadership in  
21 women's faces, generally overlooked by evolutionary psychologists, and how political  
22 ideology can interact with these effects.

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## 28 **THE CASE FOR AN EVOLUTIONARY APPROACH**

29

30 Facial appearance has a remarkable ability to affect a wide range of social  
31 judgements (Todorov & Oosterhof 2011; Todorov et al., 2013). Far from  
32 communicating solely emotional and mental states, facial appearance can also  
33 inform a wide range of social trait judgments based on differences in morphology. For  
34 example, judgements of traits like attractiveness, dominance and trustworthiness  
35 have been linked to differences in facial shape characteristics that vary with facial  
36 masculinity (Perrett et al., 1998; Mueller & Mazur 1997; Oosterhof & Todorov 2008).  
37 That these judgements are generally automatic, reliable and somewhat accurate (see  
38 e.g. Bar et al., 2006; Todorov et al., 2009; Willis & Todorov 2006; Todorov et al.,  
39 2008) suggests this stereotyping behaviour may work as a useful heuristic, helping  
40 humans to navigate their important and complex social systems.

41

42 Indeed, as modern environments differ substantially from evolutionary environments,  
43 the role of these heuristic judgements may be even more pronounced. Consider that  
44 in historical small-scale societies, ancestral humans are likely to have had first-hand  
45 knowledge of any given individual's behavioural qualities, personalities and  
46 reputation – information that is unavailable in modern societies, where larger  
47 populations make this information more difficult to attain. It is well-established that  
48 low-information settings exacerbate reliance on heuristic judgements in decision-  
49 making (see e.g., Tversky & Kahneman 1974). This bias also extends to political  
50 leadership judgements, which in modern settings are characteristically information-  
51 deprived (Converse 1975; Delli Carpini & Keeter 1996; Kinder & Sears 1985). As a

52 result of this information deficit, voters are more likely to rely on heuristic judgements  
53 to assess leadership competence (Lau & Redlawsk 2001). It is proposed that voters  
54 use information from facial appearance as a heuristic to aid in leadership decision-  
55 making (Little et al., 2012; Lau & Redlawsk 2001; Riggle et al., 1992; Antonakis &  
56 Eubanks 2017), particularly in the absence of political knowledge (Ahler et al., 2017;  
57 Lenz & Lawson 2011; Hassin & Trope 2000).

58

59 Historically, these automatic trait inferences have been considered the result of  
60 learned associations, developing through the detection and internalisation of regular  
61 occurrences (Cogsdill et al., 2014; Fazio et al., 1986; Smith & DeCoster 2000), but  
62 the automaticity and early appearance of face-based trait inferences during  
63 development suggests these intuitions are at least partly innate (Saxton et al., 2006;  
64 Cogsdill et al., 2014). While some cultural variation exists in the generation and  
65 perception of facial *expressions* (see e.g. Schmidt & Cohn 2001), many researchers  
66 now consider social judgements based on facial morphology as having evolutionary  
67 origins (e.g. Feinberg, 2008; Little, Jones, & DeBruine, 2011; Little & Roberts, 2012;  
68 Puts, Jones, & DeBruine, 2012; van Vugt & Grabo, 2015).

69

70 Evolutionary approaches to leadership propose that leadership and followership are  
71 social structures that are subject to evolutionary mechanisms. It is thought that these  
72 structures are the result of recurrent problems in the environment in which humans  
73 evolved. The coordination of group members, either in response to the environment  
74 or to other groups of people, is believed to have constituted significant evolutionary  
75 pressure to facilitate the evolution of a leadership-followership social construct (van  
76 Vugt & Ronay 2014; van Vugt et al., 2008). One such evolved mechanism may

77 include the internalisation of leadership prototypes, which are partly based on  
78 physiological features (including facial morphology), but are also activated by  
79 appropriate contingencies in the environment (van Vugt & Grabo 2015; van Vugt &  
80 Ronay 2014).

81

82 In order to understand the evolutionary roots of these prototypes, we should first  
83 consider the environment in which our species evolved, and the environmental and  
84 social demands our early hominin ancestors are likely to have faced. The small-scale  
85 societies of our evolutionary past suggest an environment in which resource  
86 allocation played a key role, particularly with respect to leadership, and scarce  
87 resources could be defended and/or seized (Petersen 2015). Naturally, leaders  
88 emerge from competition, both between-persons and between-groups, and  
89 individuals that are large, strong and aggressive are likely to have distinct  
90 advantages in competitive environments. While competition is not the only way to  
91 achieve leadership status (see also: experience, problem-solving ability, social  
92 prestige), individuals that succeed in intra- and inter-group competition enjoy the  
93 biological benefits conferred upon winners of dominance contests, human and non-  
94 human alike: namely, reproductive success (von Rueden et al., 2011; Cowlshaw &  
95 Dunbar 1991). Furthermore, the ability to quickly and accurately judge an individual's  
96 dominance, for example by perceiving facial morphology, may avoid the severe costs  
97 associated with a failed contest. Thus, we can consider humans' ability to make rapid  
98 and reflexive social judgements based on facial cues as an adaptive quality,  
99 conferring survival benefits and avoiding maladaptive costs.

100

101 In this chapter, I will firstly explain the generalised perceptions of dominance and  
102 trustworthiness based on facial morphology, how these morphologies are related to  
103 leadership characteristics, and how these cues (and the perception thereof) can be  
104 the result of evolved mechanisms.

105

## 106 **Face research as evolutionary research**

107

108 For better or worse, we tend to make social judgements about faces rapidly and  
109 reflexively (Oosterhof & Todorov 2008; Willis & Todorov 2006; Bar et al., 2006;  
110 Todorov et al., 2009). From an evolutionary perspective, these reflexive judgements  
111 should serve some functional role. Furthermore, these trait inferences should have  
112 particular value when they (1) are based on cues which have evolutionary  
113 significance, and (2) the detection of which would be adaptively beneficial<sup>1</sup>.

114

115 When evaluating faces on social dimensions, the most salient cues utilised are those  
116 to gender, age and ethnicity. Zebrowitz & Montepare (2008) propose that observers  
117 are biased toward perceiving these traits in faces, resulting in an *overgeneralisation*  
118 *effect*: even when cues to these dimensions are weak, they still elicit a response. It is  
119 further argued that stereotyping in this manner is a case of stimulus generalisation  
120 (Zebrowitz & Montepare, 2008). Well-known to cognitive psychologists, stimulus  
121 generalization occurs when a novel stimulus elicits a similar response to that  
122 generated by a previously encountered, similar stimulus. This overgeneralisation is  
123 argued to be an adaptive behaviour— any errors produced by the overgeneralisation  
124 are much less costly, compared to failing to respond appropriately in a social  
125 situation. That is, a false-positive, such as deferring to a dominant-looking individual

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<sup>1</sup> See chapter by Petersen, Dubuc & Higham for a further discussion.

126 who is submissive in nature, is less costly than a similar false-negative, such as  
127 failing to defer to a dominant-looking individual who is aggressive in nature. Because  
128 human sociality is complex, and critically important for survival in our evolutionary  
129 history, it makes intuitive sense that cognitive mechanisms have evolved to assist  
130 navigation of our social environment.

131

132 We can also see evolution at work in the specific facial cues which we use to form  
133 such generalisations. For example, it is theorised that attractive faces are preferred in  
134 leaders because traits which make faces attractive are linked to health, such as  
135 masculinity (in males), femininity (in females), symmetry, averageness and  
136 youthfulness. In male faces, masculinity is considered a marker of health because  
137 testosterone places stress upon the immune system – individuals high in facial  
138 masculinity are better able to withstand this stress (Folstad & Karter 1992). In female  
139 faces, femininity is associated with oestrogen and fertility (Thornhill & Grammer 1999;  
140 Law Smith et al., 2006). Symmetry and averageness (how representative a face is  
141 within a population; average faces lack idiosyncratic or extreme characteristics) are  
142 related to stability during development, evidenced by the absence of childhood illness  
143 and stronger immune function. The underlying cause of this developmental stability  
144 and immune health is thought to be related to genetic diversity and lack of deleterious  
145 alleles in the major histocompatibility complex (MHC) genes, which code for proteins  
146 aiding in immune function (Grammer & Thornhill 1994; Thornhill & Gangestad 1993;  
147 Lie et al., 2008; Rhodes et al., 2001). Youthfulness is also linked to health, with the  
148 age-related emergence of many cognitive and physical ailments. The association  
149 between facial cues of health and leadership ability is considered adaptive because

150 in our evolutionary past, health and physical robustness was necessary for one to  
151 obtain and successfully maintain leadership status (Cowlshaw & Dunbar 1991).

152

153 More than just acting as a cue to health and physical prowess, facial masculinity is  
154 also used as a cue to secondary behavioural characteristics that are aligned to  
155 leadership, including dominance and trustworthiness. Broadly, this is due again to the  
156 presence of testosterone, which is needed to develop such facial characteristics  
157 (Verdonck et al., 1999; Verdonck et al., 1998). Testosterone is related to a suite of  
158 behavioural traits linked to dominance, like aggressiveness, risk-taking, and  
159 antisocial behaviour (Mazur & Booth 1998; Archer 1991; Stanton et al., 2011;  
160 Apicella et al., 2008; Coates & Herbert 2008; Rowe et al., 2004; Dabbs & Morris  
161 1990). The presence of masculine facial characteristics can consequently be  
162 associated with a generalisation of behavioural dominance. Indeed, faces which have  
163 been digitally manipulated to appear more masculine receive higher ratings of  
164 dominance, and are perceived as being more cold and dishonest; conversely, more  
165 feminine male faces are considered cooperative, warm and honest (Perrett et al.,  
166 1998).

167

168 Our perceptions of leadership ability in faces, and our preferences in who we  
169 consider to be a good leader, have underlying biological roots. The characteristics  
170 which make a person a good leader (or, at least, good at attaining leadership) can be  
171 traced to biological origins, and evolutionary explanations exist for both the presence  
172 and the perception of these cues.

173

174 **Generalised leadership preferences**

175  
176 Numerous studies conclude that facial appearance has the ability to affect the  
177 outcome of elections. Todorov, Mandisodza, Goren, & Hall (2005) found that  
178 leadership competence ratings based solely on facial appearance predicted the  
179 outcomes of U.S. Senate races at rates above chance (up to 73.3%). Impressively,  
180 these judgements were made after only 1 second of exposure time. Follow-up  
181 studies have shown that judgements of competence remain reliable at exposure  
182 times of as little as 100 milliseconds (Ballew & Todorov 2007; Willis & Todorov 2006),  
183 and judgements of trustworthiness may be reliable with exposures of just 39  
184 milliseconds (Bar et al., 2006), suggesting that these leadership-related judgements  
185 occur rapidly and reflexively, rather than deliberately. But, what are the specific  
186 facial cues associated with the perception leadership competence?

187

188 **Masculinity and dominance**

189  
190 The shape qualities used in most face perception research on leadership ability are  
191 based on sexual dimorphism – the difference in shape between male and female  
192 faces. See Figure 1. The enlarged jawbones, more prominent cheekbones and  
193 pronounced brow ridge are bony structures that characterise a masculine facial  
194 appearance and differentiate male faces from female faces (Little et al., 2011; Enlow  
195 1982). This masculine facial shape emerges at puberty, due in part to an increase in  
196 male circulating testosterone (Penton-Voak & Chen 2004). More than simply  
197 coinciding at this crucial developmental phase, testosterone appears to have a direct,



198 causal link to the growth of these bony structures (Verdonck et al., 1999; Silveira et  
199 al., 1992).

200

201 FIGURE 1 ABOUT HERE.

202

203 How is the accurate assessment of masculinity adaptive, in an evolutionary sense? A  
204 masculine appearance is shaped by testosterone, and testosterone accompanies  
205 dominance, aggressiveness and antisocial behavioural qualities (Mazur & Booth  
206 1998; Archer 1991; Stanton et al., 2011; Apicella et al., 2008; Coates & Herbert 2008;  
207 Rowe et al., 2004; Dabbs & Morris 1990). The accurate identification of a dominant,  
208 aggressive individual would certainly be useful in shaping social responses to such  
209 persons, as a mis-step could prove costly if aggressive conflict ensues. Non-human  
210 primates that respond inappropriately to social cues are not preferred as social  
211 partners, are generally shunned by other group members, and only achieve low  
212 dominance ranks themselves (Sackett 1968; Capitanio 1986; Bastian et al., 2003).  
213 Consequently, it is possible to surmise that accurate judgements in this social domain  
214 could be adaptively beneficial. Indeed, humans are particularly attuned to markers of  
215 physical formidability in faces, body morphology and voices (Sell et al., 2009; Sell et  
216 al., 2010).

217

218 Relating this to leadership, consider that traits associated with masculinity  
219 (dominance, aggressiveness) and femininity (trustworthiness, honesty) could both  
220 easily be considered qualities that are important for a leader to possess (van Vugt &  
221 Grabo 2015). In modern human societies, the democratic selection of a group leader  
222 is now commonplace, but in social primate species, dominance hierarchies and

223 aggressive conflict are ubiquitous (Walters & Seyfarth 1987). Here, group leaders are  
224 more likely to emerge if they have qualities which aid them in dominance contests:  
225 e.g. physical prowess, large body size and aggressiveness (Cowlshaw & Dunbar  
226 1991). It is theorised that humans prefer dominant leaders because these associated  
227 traits and behaviours inspire confidence in members of the group. These preferences  
228 are further theorised to be exacerbated under conditions of threat or inter-group  
229 conflict, when these traits would be considered especially beneficial to the group as a  
230 whole (Spisak et al., 2012; Little et al., 2007; van Vugt & Grabo 2015; Nevicka et al.,  
231 2013). See also the following section on context-specific leadership preferences.

232

233 Dominance is an important leadership quality in many non-human primate species,  
234 not solely because superior fighting ability or body size makes individuals more likely  
235 to win agonistic conflicts. In small-scale traditional societies and large-scale  
236 democratic societies alike, leaders are often taller, stronger and more behaviourally  
237 dominant than their peers (see e.g., Lord, De Vader, & Alliger, 1986; Maybury-Lewis,  
238 1967; Stulp, Buunk, Verhulst, & Pollet, 2013; von Rueden, Gurven, Kaplan, &  
239 Stieglitz, 2014; Werner, 1982). Rather than simply enforcing followership through  
240 physical coercion, it is thought that dominant individuals may also naturally elicit  
241 followership because their appearance reduces conflict in the first instance: a  
242 dominant leader can more effectively act as peacekeeper, reducing intra-group  
243 conflict (van Vugt 2006). Furthermore, many dominance contests in primates are  
244 preceded by demonstrative threat displays that serve to resolve conflict peacefully –  
245 if one can estimate the strength of their opponent before a conflict takes place, costly  
246 escalations are limited. Furthermore, once dominance status has been established  
247 between two individuals, the likelihood of violent aggression is minimised, with

248 participants favouring threat and avoidance as strategies to resolve conflict with  
249 minimal fitness costs. Such conflict avoidance strategies are apparent in humans  
250 (Sell 2011), as well as in numerous primate and mammalian species – including  
251 rhesus macaques (Bernstein & Ehardt 1985), chimpanzees (de Waal 1986), gorillas  
252 (Sicotte 1993) and wolves (Garcia 1983). In this manner, social groups may live in  
253 relative peace with a large, uncontested male as the group leader.

254

255 Groups also benefit from dominant leaders because of the access to resources they  
256 provide. Large, dominant individuals are likely to have increased fighting and hunting  
257 abilities (von Rueden et al., 2014), and are more able to monopolise resources and  
258 maintain larger territories, all of which would benefit groups as a whole and inspire  
259 freely-conferred leadership status. Von Rueden & Gurven (2012) suggest that  
260 physical dominance may reduce the effort required to coordinate group members,  
261 because these dominant individuals can more readily solicit joint attention of group  
262 members, thus facilitating group cooperation. Such mechanisms for mutually-  
263 beneficial conflict resolution, freely-conferred followership and group coordination are  
264 likely to be favoured by natural selection as they minimise fitness costs at both the  
265 individual- and group-level (Silk 1998).

## 266 **Trustworthiness**

267

268 Trustworthiness is also an important quality in a leader. In an experimental study  
269 wherein faces were altered to appear more or less trustworthy, participants  
270 consistently chose the more trustworthy faces in a hypothetical national leadership  
271 election (Little et al., 2012). Cues to facial trustworthiness generally align with  
272 femininity: feminised faces receive higher trustworthiness ratings than their

273 masculinised counterparts (Perrett et al., 1998). While many species benefit from  
274 social hierarchies determined primarily by physical dominance (Smuts et al., 1987;  
275 Cowlshaw & Dunbar 1991), modern human populations are unique in that leaders  
276 are democratically selected, allowing more prosocial and diplomatic traits to gain  
277 importance as leadership qualities (Little et al., 2012).

278

279 Considering the apparent relatedness of the dimensions of submissiveness-  
280 dominance and trustworthiness-untrustworthiness, where submissiveness and  
281 trustworthiness may capture similar attributions, Oosterhof & Todorov (2008)  
282 examined both dimensions to model how these map on to social perceptions. The  
283 correlation between trustworthiness and dominance attributions was small, and the  
284 authors found that the trustworthiness dimension seemed related to valence or  
285 emotional state (happy faces appearing more trustworthy), and, to some extent,  
286 youthfulness. The dominance dimension seemed more related to masculinity and  
287 facial maturity, perhaps due to the age-related emergence of masculine facial  
288 characteristics.

289

290 While these findings suggest that femininity and trustworthiness may not be captured  
291 by the same facial morphologies, and that trustworthiness may be better captured by  
292 general valence, studies have found that feminine facial features are related to  
293 perceptions of pro-social leadership traits including trustworthiness and  
294 cooperativeness. Gladstone & O'Connor (2014) found that would-be negotiators  
295 tended to prefer feminine-faced social partners, perhaps because of an  
296 overgeneralisation of submissiveness rather than a desire for a diplomatic,  
297 trustworthy counterpart.

298

299 Another element of facial trustworthiness is familiarity – the more familiar a face  
300 looks, the more we tend to trust it (Buckingham et al., 2006). Rather than pointing to  
301 specific morphological facial cues, familiarity and ethnicity both have more to do with  
302 the perceiver than the perceived, reflecting the sum of the perceiver’s life experience.  
303 As such, this is difficult to quantify, but studies do show that when accounting for  
304 these factors, we generally prefer our leaders to look like us (DeBruine 2002, 2005;  
305 DeBruine et al., 2008). Using a novel approach to an economic game study,  
306 DeBruine (2002) manipulated faces of playing partners to resemble either (a) the  
307 player or an unknown person, or (b) a familiar (famous) person or an unknown  
308 person. Manipulations in the direction of the player’s own face served to raise the  
309 trust given to the partner. That no effect was found for familiar (famous) faces  
310 suggests that familiarity may be less important than resemblance. The author  
311 suggests that a mechanism of kin-recognition is activated when making these implicit  
312 trustworthiness attributions, and this finding is repeated when trustworthiness is  
313 judged explicitly (DeBruine 2005). Studies also show that other-race faces are  
314 viewed as less trustworthy than own-race faces (Salam et al., 2017; Kubota et al.,  
315 2013; Stanley et al., 2011), suggesting that these mechanisms of kin-favouritism  
316 might also extend to a general in-group-favouritism (especially when considering the  
317 intrinsic relatedness of small-scale societies). Favouring positive social interactions  
318 with individuals who resemble oneself chimes with kin selection theory (Hamilton  
319 1964), which suggests individuals will show biases in social interactions toward those  
320 who share genetic relatedness. The subtle fitness advantages conferred upon  
321 relatives increases the inclusive fitness of the individual, thus perpetuating the  
322 behavioural bias (DeBruine et al., 2008; Hamilton 1964).

323

324 This trustworthiness of self-similarity may be related to facial averageness – how  
325 representative a given face is, based on the population, or rather, how close the  
326 facial configuration is to the population mean. Early evidence in this domain pointed  
327 to averageness being more important than self-similarity on judgements of  
328 attractiveness (Penton-Voak et al., 1999). To a certain degree, averageness is  
329 considered a marker of developmental stability and genetic diversity, both  
330 themselves indicators of a strong immune system (Thornhill & Gangestad 1999;  
331 Penn et al., 2002). Average faces are considered attractive and trustworthy, while  
332 anomalous or idiosyncratic faces receive generally negative stereotypes (Langolis &  
333 Roggman 1990; Langolis et al., 1994; Zebrowitz et al., 2003). Although Zebrowitz  
334 and colleagues interpret these findings as an overgeneralisation of responses to unfit  
335 or unhealthy individuals, it may be that anomalous faces are non-average (divergent  
336 from the population mean) and therefore appear visually similar to faces of fewer  
337 individuals. A simpler explanation may be that positive attributions (like  
338 trustworthiness) fit with the attractiveness halo, and traits like averageness and  
339 symmetry are associated with positive personality attributions via their effect on  
340 perceived attractiveness (Eagly et al., 1991; Dion et al., 1972).

341

342 In the preceding pages, I have discussed how both dominance and trustworthiness  
343 can be considered valued leadership qualities, and detailed how both of these traits  
344 can be perceived based upon facial morphological features. It is notable that facial  
345 dominance and trustworthiness are not the *only* routes to perceptions of leadership  
346 competence. One such further example centres on the age of the individual; facial  
347 age is associated with leadership ability, inasmuch as it is considered a proxy for

348 experience. Moreover, this experience may be more important in certain leadership  
349 contexts. For example, there is some evidence that older (more-experienced) leaders  
350 are preferred during times of stability, while younger (more-exploratory) leaders are  
351 preferred during times of change (Spisak et al., 2014). What follows is a summation  
352 of a current direction in this research area: how leadership qualities can be differently  
353 favoured, based on the task at hand.

354

### 355 **Task-congruent leadership preferences**

356  
357 As covered in the preceding sections, a number of traits are associated with  
358 leadership ability. While some of these traits may be generally valued in leadership  
359 (e.g., trustworthiness), others may be prioritised differently according to the specific  
360 leadership situation. Dominance and trustworthiness fail to fit together neatly as  
361 leadership qualities, behaviourally sitting at opposing ends of a continuum. Much of  
362 the difference between these traits seems to be captured by variation in  
363 masculinity/femininity. Masculinity is generally aligned with untrustworthiness,  
364 dominance and dishonesty, while femininity is aligned with trustworthiness, honesty  
365 and diplomacy (Perrett et al., 1998). How could it be that apparent opposites could  
366 both be considered important characteristics of a leader?

367

368 In real-world leadership choices, whether choosing a leader to run a football team, a  
369 company or a country, many factors can influence how we conceptualise what would  
370 make a good leader. For example, if a country is at war, voters may prioritise  
371 leadership qualities that reflect masculine and dominant characteristics. Conversely,  
372 in peacetime, more feminine and diplomatic qualities may be more strongly valued by

373 voters. Such a tradeoff is known as *task-congruent selection* (Little 2014; Little &  
374 Roberts 2012): that is, we value different leadership qualities based on the task for  
375 which the leader is being chosen.

376

377 The first study to experimentally demonstrate this effect in faces examined shape  
378 differences in masculinity. When asked to choose a hypothetical national leader,  
379 participants showed no clear preference for either masculinised or feminised faces.  
380 However, when the context of voting was changed to wartime, participants generally  
381 preferred masculinised faces; in peacetime, feminised faces were chosen to a  
382 greater degree (Little et al., 2007). This finding also extended to faces that were  
383 manipulated to resemble real politicians. Manipulating images based on the  
384 difference in face shape between George W. Bush and John Kerry (former-president  
385 Bush's lead opponent in 2004), Little *et al.*, (2007) were able to create novel face  
386 stimuli that looked more like one candidate, and less like the other. When participants  
387 were asked to choose a hypothetical national leader during a time of war from these  
388 manipulated images, voters generally preferred the faces which looked more like  
389 Bush (and less like Kerry). When making the same decision during a time of peace,  
390 participants preferred the faces which were manipulated to look more like Kerry (and  
391 less like Bush). At the time of the Bush-Kerry presidential race, the U.S. was  
392 engaged in the Iraq war, and constituents were still largely unsettled by the 2001  
393 terror attacks. These findings were the first of their kind to show the importance of  
394 context on the way differing leadership traits could be prioritised, with implications in  
395 real-world electoral outcomes. Many studies have since examined similar concepts,  
396 showing general agreement that masculine/dominant facial features are favoured  
397 during times of war, and feminine/trustworthy faces are favoured during times of



398 peace, or when cooperation/diplomacy is prioritised. A summary of these research  
399 findings is provided in Table 1.

400

401 TABLE 1 ABOUT HERE.

402

403 It makes intuitive sense that we prefer different behavioural traits in leaders based on  
404 the leadership task for which they are being selected. It may surprise many that we  
405 make such decisions based, in part, on automatic attributions drawn from facial  
406 characteristics. That we can make such judgements in a heuristic manner, rather  
407 than entirely deliberatively, serves humans well in navigating complicated social  
408 systems. The question regarding whether these task-congruent preferences are  
409 evolved or learned by association warrants discussion. Historical accounts and  
410 accounts of modern hunter-gatherer societies, which more closely resemble early  
411 human groups, show similar evidence for task-congruent leadership. Price & van  
412 Vugt (2014) report that the Cheyenne (a native American tribe) had more aggressive  
413 and younger leaders during times of war, while peacetime brought leaders who were  
414 more skilled at diplomacy than violence (van Vugt & Grabo 2015).

415

416 Little (2014) demonstrates that these task-contingent judgements are both implicit  
417 and learned. After first showing that masculinity is favoured in wartime over  
418 peacetime contexts, a follow-up study revealed that it is also possible to learn face-  
419 behaviour associations. By manipulating an arbitrary facial feature (distance between  
420 eyes) and pairing these differences with short descriptions of the individual (for  
421 example, "...helps children in training for various sports, including boxing," versus,  
422 "volunteers his time at a care home for the elderly"), it was possible to learn

423 associations between physical prowess or cooperation and the arbitrary facial  
424 features. Results of the study showed that indeed, participants were more likely to  
425 choose leaders for competitive or cooperative tasks that had task-congruent facial  
426 features in the learning trials. This shows that while implicit associations are  
427 unlearned and reflexive, it is also possible that an element of associative learning  
428 takes place in the accumulation of life experience.

### 429 **Current directions: Women's faces and political ideology**

430  
431 A limitation of existing research in this area is that it largely ignores female facial cues  
432 to leadership competencies. Women are generally omitted from this type of research  
433 because of their historically limited access to leadership positions. In tribal or hunter-  
434 gatherer societies, sexually-dimorphic characteristics relating to body size and  
435 aggressiveness leave women *de facto* excluded from leadership roles. The implicit  
436 non-dominance of females (relative to males) may account, in part, for women's  
437 tendency to obtain an overall lesser degree of political influence, at least in  
438 traditional/historical societies (von Rueden et al., 2014).

439

440 Nevertheless, in modern societies, women obtain leadership roles in ever-increasing  
441 numbers, and face research in relation to women and leadership is still overall  
442 lacking. Increasing the attractiveness of female (and male) faces improves their  
443 likelihood of being elected (Berggren et al., 2010), but there are surely many other  
444 factors to explore within women's faces beyond attractiveness. For example, while  
445 dominance and masculinity can be considered leadership-appropriate qualities in  
446 male leaders, for women, these qualities tend to come with a "dominance penalty."  
447 Both implicit and explicit dominance behaviour in women tends to draw more

448 negative attributions, including a decrease in hireability (for a review, see Williams &  
449 Tiedens 2016). Interesting research has been developed recently, which suggests  
450 this relates to a gender-typicality of appearance (and thus, implicit behavioural  
451 qualities). Carpinella, Hehman, Freeman, & Johnson (2016) report that US  
452 conservatives tend to prefer a greater degree of gender-typicality in both male and  
453 female political candidates – that is, they prefer men to appear more masculine, and  
454 women to appear more feminine, compared with US liberals, who do not exhibit such  
455 preferences.

456

457 By examining differences in ratings of leadership ability in America pre- and post-  
458 9/11, Falk & Kenski (2006) showed that differences in perceived external threats can  
459 influence a preference for male leadership over female leadership. This male  
460 preference was more pronounced for conservative voters than for liberal voters,  
461 suggesting that political ideology can interact with preferences for masculine  
462 leadership prototypes, either by moderating (a) the perceived level of threat, or (b)  
463 the preferred responses to threat. Indeed, research has shown that conservative  
464 voters tend to see the world as generally more threatening and competitive than  
465 liberal voters, who view the world as more peaceful and cooperative (for a review,  
466 see Jost, Federico, & Napier, 2009). Laustsen (2016) suggests that this difference in  
467 perceived threat, based on political ideology, has the potential to influence gender-  
468 specific and context-specific leadership choices.

469

## 470 **Summary and Conclusions**

471

472 When considering the evolved psychological mechanisms for the perception of  
473 leadership in faces, it is important to consider what skills and characteristics would  
474 have been valuable for leaders to possess in our evolutionary history. Human  
475 sociality is complex and important, and cognitive heuristics which allow for rapid and  
476 reflexive social judgements are sure to aid in navigating these social systems. By  
477 guiding appropriate responses to others, these shortcuts allow individuals to benefit  
478 from rapid categorisation of social signals, and avoid maladaptive costs associated  
479 with inappropriate responses.

480

481 The perception of leadership ability in faces is linked to variance in facial morphology,  
482 and these morphologies tell us something about the individuals who carry them.

483 Testosterone, which influences facial masculinity and immune health, is also related  
484 to behavioural dominance. Recognising individuals who are dominant, both physically  
485 and behaviourally, is a valuable skill. Groups benefit from the leadership of dominant  
486 individuals because of the protection, territory and resources they are able to secure.  
487 Dominant individuals may also provide stability to groups because stable dominance  
488 hierarchies reduce intra-group competition and increase group cooperation and  
489 coordination.

490

491 Trustworthiness and dominance are two characteristics that are valued in leaders,  
492 but these traits may be conceptually different: trustworthiness perhaps relating more  
493 to valence or behavioural disposition, and dominance relating more to  
494 masculinity/femininity. Differing scenarios can prioritise whether a trustworthy or a  
495 dominant leader is valued – dominant/masculine leaders are preferred during times  
496 of war, conflict and uncertainty, while trustworthy/feminine leaders are preferred

497 during times of peace, when diplomacy and cooperation are more valued as leader  
498 characteristics. Recent research expands these concepts to include women as  
499 political leaders, and individual differences (such as political ideology) that can  
500 interact with these effects. The perception of leadership ability has much to do with  
501 the face of the proposed leader, but situational contexts and individual differences on  
502 part of the perceivers are beginning to be better understood.

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