The big man has a big mouth: Mouth width correlates with perceived leadership ability and actual leadership performance

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ABSTRACT

Previous studies have found that facial appearance can predict both the selection and performance of leaders. Little is known about the specific facial features responsible for this relationship, however. One possible feature is mouth width, which correlates with the propensity for physical combat in primates and could therefore be linked to one's perceived dominance and achievement of greater social rank. Here, we found that mouth width correlated with leader selection in experimentally standardized (Study 1A) and experimentally manipulated (Study 1B) faces. Applying these findings to real leaders, we observed that mouth width correlated with judgments of CEOs' leadership ability and with a measure of their actual leadership success (i.e., the profitability of their companies; Study 2). Individuals with wider mouths were also more likely to have won U.S. senate, but not gubernatorial, races (Study 3). Mouth width may therefore be a valid cue to leadership selection and success.

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One of the most cherished rights in modern society is the freedom to choose our leaders. Even outside the limits of political governance, few contemporary leaders occupy their roles based on entitlement. Rather, everyone ranging from the Chief Executive Officer (CEO) of Microsoft to the shift manager at the local McDonald's restaurant is selected by the evaluation of others. Naturally, choosing a leader is a task of no small consequence. Billions of dollars are spent annually on political campaigns across the globe, and thousands of people squeezed into St. Peter's Square for over a day to await the outcome of the Catholic Church's 2013 papal conclave (Donadio, 2013; Pinto-Duschinsky, 2002). Given this premium placed on leadership selection, it is all the more surprising that a significant predictor of a leader's selection and success is his or her facial appearance (e.g., Zebrowitz & Montepare, 2005). The present work therefore attempted to better understand how specific facial features can contribute to the perception and success of leaders.

Recent studies have found that judgments made from the faces of political candidates predict real-world election outcomes at various levels of government throughout the world. In the U.S., perceptions of facial photographs predict Senate, House, and gubernatorial election outcomes (Ballew & Todorov, 2007; Todorov, Mandisodza, Goren, & Hall, 2005), as well as the popular vote totals in presidential elections and in Democrat and Republican party primaries (Armstrong, Green, Jones, & Wright, 2010). Other studies have demonstrated that naïve observers' judgments of political candidates' facial appearance predict electoral outcomes in several other nations across Asia (Rule et al., 2010), Australia (Martin, 1978), Europe (e.g., Little, Burriss, Jones, & Roberts, 2007), and South America (Lawson, Lenz, Baker, & Myers, 2010).

People therefore seem to agree about what a good leader looks like and evidence suggests that they go on to cast their votes for that person. Perhaps more surprising, however, is that these judgments may contain a degree of validity for predicting measures of *actual* leadership performance. Although leadership ability is fairly difficult to measure among politicians due to the multifaceted nature of their position, leaders' success can be more easily quantified in the corporate world in the form of company profits, which act as a "bottom-line" for businesses (e.g., Kaiser, Hogan, & Craig, 2008). Several studies have demonstrated that social judgments made from the faces of CEOs (the highest position and thus "leader" in a business corporation) correlate with their companies' profits. For example, studies have found that inferences of leadership drawn from the faces of CEOs of Fortune 1000 companies predict their organizations' profits (e.g., Rule & Ambady, 2008) and that judgments made from the faces of Managing Partners (a leadership role in law firms) also correlate with firms' financial success (Rule & Ambady, 2011a) — even when the photos are taken decades before they attain their positions (Rule & Ambady, 2011b). The facial features associated with leadership therefore appear to be present early in adult life, and thus are likely not the product of experiencing the pressures associated with obtaining and holding leadership roles.

Several studies have uncovered facial cues that correlate with measures of perceived or actual leadership performance. Features conveying tall physical height or masculinity predict leadership selection in

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laboratory experiments (Little et al., 2007; Re, DeBruine, Jones, & Perrett, 2013; Re, Hunter, et al., 2013; Spisak, Homan, Grabo, & Van Vugt, 2011) and judgments of social traits like competence and power predict leadership selection in the real world (Rule et al., 2010; Todorov et al., 2005). One study found that male CEOs' facial width-to-height ratio (fWHR; a measure of the horizontal distance between the left and right zygion divided by the vertical distance between the brow and upper lip) positively correlated with their companies' financial performance in certain contexts (Wong, Ormiston, & Haselhuhn, 2011). Despite these findings, however, no study has investigated how internal features of the face relate to leadership ability or has described the facial features that bridge perceivers' impressions of leaders' faces to measures of their actual success. Yet previous research has shown that minimal cues from facial features can be enough for perceivers to extract a wealth of complex social information; for example, perceivers can accurately judge sex and sexual orientation from as little as men's and women's eyes (Brown & Perrett, 1993; Rule, Ambady, Adams, & Macrae, 2008; Rule, Ambady, & Hallett, 2009). Thus, particular facial features may express sufficient information for perceivers to reliably predict measures of objective leadership performance as well.

Building on studies showing that judgments of physical dominance and power from individuals' faces predict leadership selection and performance (Little et al., 2007; Rule & Ambady, 2008), researchers have also demonstrated that experimentally enhancing facial dominance by increasing perceived height or masculinity boosts a person's perceived leadership ability (Little et al., 2007; Re, DeBruine, et al., 2013). These studies did not examine whether specific features support leadership judgments, however, focusing instead on changes to face shape overall. One possible internal feature that may relate to leadership perceptions is mouth width.

Evolutionary theory suggests that modern human leader selection is biased by cues to physical formidability, as leadership hierarchies have historically been determined by force (Murray & Schmitz, 2011; Riggio & Riggio, 2010; van Vugt, Hogan, & Kaiser, 2008). Canine dimorphism and tooth size correlate with a propensity for male physical combat in anthropoid primates (Harvey, Kavanagh, & Clutton-Brock, 1978; Plavcan & van Schaik, 1992), and human mouth width is proportional to the distance between the underlying canines (Stephan & Henneberg, 2003). Mouth width may therefore be an internal facial feature that affects the perception of leadership ability in humans. Indeed, narrower mouths are associated with babyfacedness and cuteness in infants (Hildebrandt & Fitzgerald, 1979) — judgments that oppose the perceptions of dominance typically found in the faces of individuals perceived as good leaders (Little et al., 2007). Wider mouths could therefore make faces look more dominant, which could thus increase perceived leadership ability.

Here, we examined whether mouth width relates to both perceptions of leadership and actual leadership performance. We first investigated how the widths of individuals' mouths relate to perceptions of their dominance and leadership ability using a set of standardized faces for which these facial metrics could be measured with high precision (Study 1A). We then manipulated mouth width experimentally and asked participants to choose individuals with either narrow or wide mouths as leaders in a forced-choice task (Study 1B). Next, we examined whether mouth width correlates with a measure of leader performance in the real world in a sample of Fortune 500 CEOs (Study 2). Finally, we tested whether mouth width predicts leadership selection in samples of U.S. senate and gubernatorial races (Study 3). Because the theory that mouth width associates with dominance is based on male primates (Harvey et al., 1978; Plavcan & van Schaik, 1992), and because the vast majority of leadership roles in both business and politics are still occupied by men, we restricted our investigation to male faces. These are the first studies to explore the specific physical features that underlie perceivers' accuracy in inferring leadership ability from faces.

1. Study 1A

To address the question of whether individuals' perceptions of leadership vary according to the width of targets' mouths, we asked participants to rate the expected leadership ability of a sample of standardized faces for which we could measure mouth width with high precision. Considering that past research found that fWHR related to actual leaders' performance in particular contexts (Wong et al., 2011), we also measured fWHR and examined how participants' judgments of leadership ability related to both of these facial metrics. We also tested whether mouth width correlated with perceptions of dominance, as theorized, and with other personality judgments related to leadership.

1.1. Method

We used 50 male faces collected from a publicly-available database (www.3d.sk). All images were of Caucasian men (M_{age} = 24.96 years, SD = 4.66, range = 18–40) photographed under standardized lighting at the same distance from a 0° angle with neutral expressions, hair pulled back, and without facial adornments (glasses, jewelry, etc.); inter-pupillary distance was also standardized. We measured the mouth width (defined as the horizontal distance between the two canthi) and fWHR (as defined in previous studies; e.g., Wong et al., 2011) of the 50 face images in pixels by delineating the faces with 189 facial markers in Psychomorph, a custom face processing software (Rowland & Perrett, 1995) (see Fig. 1).

Forty-eight Mechanical Turk (MTurk) Workers (29 women, 19 men; M_{age} = 37.94 years, SD = 14.33) rated all of the faces for how successful a leader they thought each person would be from 1 (*Not at all successful*) to 7 (*Very successful*). Power analysis indicated that this sample would be sufficient to achieve more than 83% power in a two-tailed one-sample *t*-test based on the average effect size in social and personality psychology (r = .21; Richard, Bond, & Stokes-Zoota, 2003) assuming a false-positive rate of 5%. Because attractiveness influences how people are perceived (e.g., Dion, Berscheid, & Walster, 1972), we asked separate MTurk Workers (N = 17; 11 women, 6 men; M_{age} = 35.82 years, SD = 12.77) to judge each target's facial attractiveness (1 = *Not at all attractive*, 7 = *Very attractive*) to use as a covariate in our analyses.
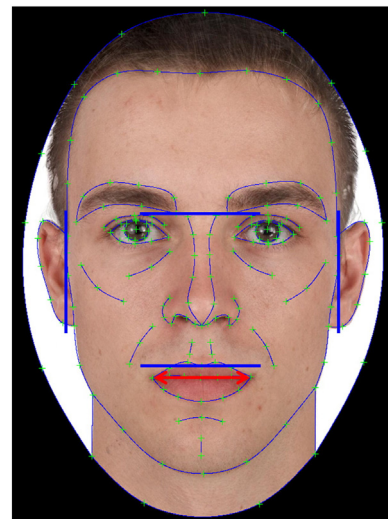

Fig. 1. An example of a standardized face showing 189 delineation points (green crosses) and an outline of face shape (thin blue lines). Mouth width constituted the horizontal distance between the two canthi (shown here with red arrow). Facial width-to-height ratio (fWHR) consisted of the horizontal width between the two zygia divided by the vertical distance between the brows and upper lip (shown here with blue bars). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)