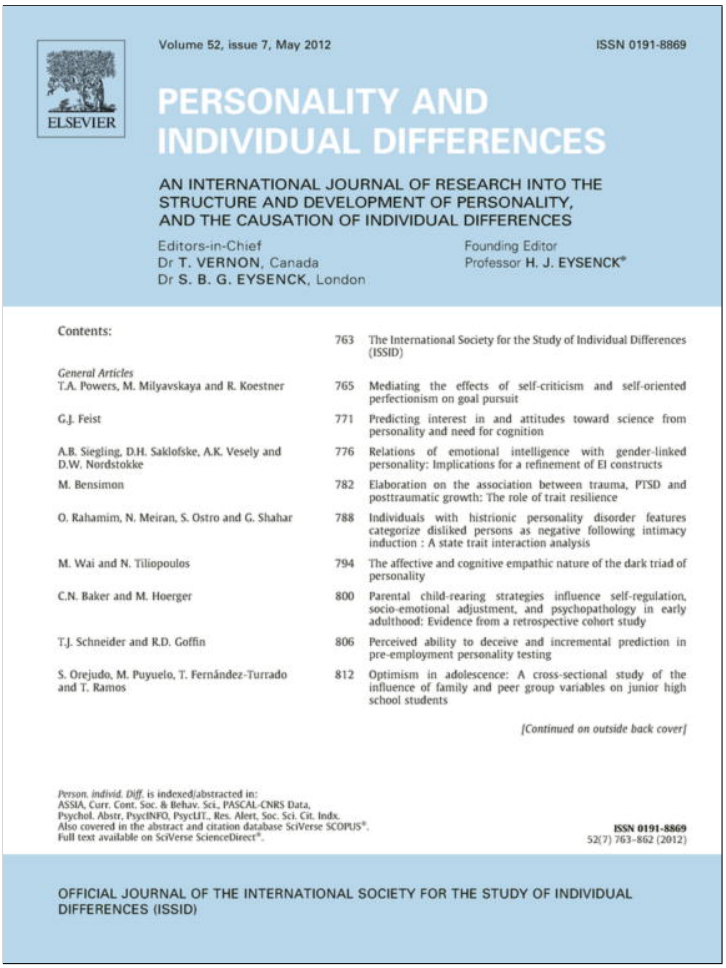

Volume 52, issue 7, May 2012 ISSN 0191-8869

PERSONALITY AND INDIVIDUAL DIFFERENCES

AN INTERNATIONAL JOURNAL OF RESEARCH INTO THE STRUCTURE AND DEVELOPMENT OF PERSONALITY, AND THE CAUSATION OF INDIVIDUAL DIFFERENCES

Contents:

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ISSN 0191-8869
52(7) 763–862 (2012)

OFFICIAL JOURNAL OF THE INTERNATIONAL SOCIETY FOR THE STUDY OF INDIVIDUAL DIFFERENCES (ISSID)

Personality and Individual Differences 52 (2012) 855–857

Contents lists available at SciVerse ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Short Communication

Facial width-to-height ratio predicts achievement drive in US presidents

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ARTICLE INFO

Article history:
Received 28 September 2011
Received in revised form 14 December 2011
Accepted 29 December 2011
Available online 30 January 2012

Keywords:
Facial structure
Facial width-to-height ratio
Dominance
Achievement drive
Political behavior
Presidents

ABSTRACT

Facial width-to-height ratio (fWHR) has been associated with aggression, unethical behavior, company profit, and dominance; however, it is currently unclear whether this facial trait relates to politically relevant character traits. Here we examine fWHR in an elite sample of political leaders, former US presidents ($n = 29$), who were rated for forcefulness, pacifism, inflexibility, and achievement drive; traits potentially linked to fWHR. The first three of these traits were unrelated to fWHR, but we found a positive association between fWHR and achievement drive ($r = .58$, $p < .01$), and a negative association to the trait "poise and polish" ($r = -.38$, $p < .05$). These results extend associations of behavior with facial structure to individuals in the highest echelons of power, suggest connections from biology to politically relevant character traits, and indicate that fWHR may also be associated with achievement-striving alongside associations with dominance and aggression.

1. Introduction

While recent research has expanded our knowledge concerning biological influences on politically relevant attitudes and behavior (e.g. Alford, Funk, & Hibbing, 2005; also see Eaves & Eysenck, 1974; Martin et al., 1986), the identification of specific biological markers linked to behavior amongst those acting in a political capacity is still in its infancy. Here we examine the association of facial width-to-height ratio (fWHR; the bizygomatic width divided by upper-face height: see Fig. 1), a putatively sexually-dimorphic trait previously associated with measures of aggression (Carré & McCormick, 2008), cheating, sense of power, and deception (Haselhuhn & Wong, 2012), and corporate success (Wong, Ormiston, & Haselhuhn, 2011), to a set of conceptually related character traits with relevance to political decision-making amongst a set of elite political leaders: Former US presidents.

The sexually dimorphic nature of fWHR in the human skull was first highlighted by Weston, Friday, and Lio (2007); but see Özener (in press), indicating that adult men had higher fWHR than women, independent of body size and age. Speculating that the sexual dimorphism of fWHR may represent an honest signal of physical dominance, perhaps as a function of developmental testosterone exposure (e.g. Verdonck, Gaethofs, Carels, & de Zegher, 1999), Carré and McCormick (2008) found that fWHR was associated with aggressive behavior in men, (although not in women). Haselhuhn and Wong (2012) reported broadly similar results, finding that men with higher fWHR self-reported a greater sense of power, and were more likely to deceive or cheat when this would increase their personal financial gain. Furthermore, Stirrat and Perrett (2010) observed that males with greater fWHR were more prone to exploit the trust of others and were less trusted than counterparts with lower fWHR.

While a range of character traits likely influence political attitudes (Lewis & Bates, 2011), those linked to fWHR – dominance, aggression, and a greater sense of power – are perhaps of special importance for political decision making (along with conceptually related traits such as forcefulness, (low) pacifism, and inflexibility; Simonton, 1986; see also Winter, 2003). It is currently unclear, however, if any of these politically relevant character traits are associated with fWHR. For instance, if fWHR, as a possible proxy measure of testosterone exposure, is a direct marker of increased aggression (Finkelstein et al., 1997), then pacifism should be associated with lower fWHR. Alternatively, if fWHR represents status concerns rather than aggression per se, it may be linked to achievement striving, with connections to factors such as military decisions being contingent on circumstance (e.g. van Honk, Terburg, & Bos, 2011).

To better understand the association of fWHR with politically relevant personality traits, we investigated fWHR in all former US presidents for whom adequate photographs and character information were available. This group presented a set of key advantages for the study: firstly, reliable measures on a range of politically relevant character traits have been reported for the

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doi:10.1016/j.paid.2011.12.030

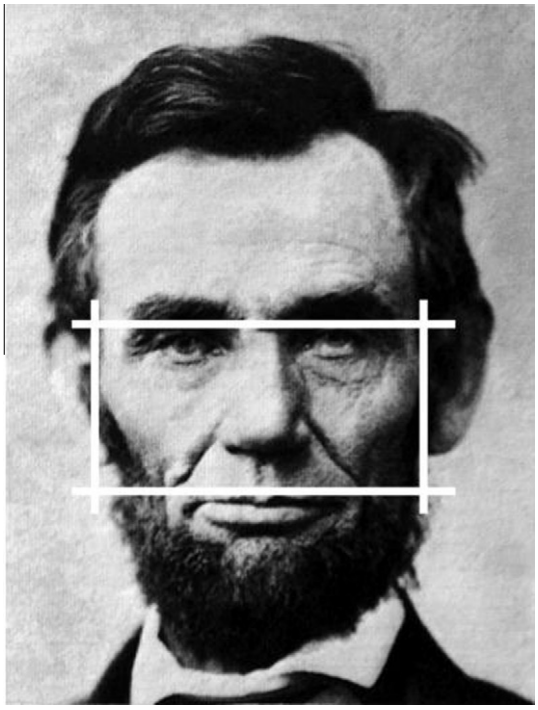

Fig. 1. Illustration of the facial width-to-height ratio (fWHR) measure: Horizontal lines represent the distance between the upper-lip and the highest point of the eyelids (upper-face height); vertical lines represent the maximum distance between the left and right facial boundary (bizygomatic width). fWHR was calculated as bizygomatic width divided by upper-face height.

presidents (Simonton, 1986). Secondly, using this sample of elite individuals allowed us to investigate correlates of political behavior at the very highest level of politics, serving to inform whether biological traits associate with actualised politically relevant behavior.

In line with previous work, showing links from fWHR to aggression and dominance, we hypothesised that fWHR would positively predict the character traits of achievement drive, inflexibility, and forcefulness, and negatively predict pacifism.

2. Methods

2.1. Measures

2.1.1. Face stimuli

Twenty nine frontal photographs of former US presidents were analysed (see Table 1). Fourteen Presidents could not be analysed because either no adequate frontal photograph was available (ruling out several early presidents) or had not been rated by Simonton (1986), whose data extended only as far as the presidency of Ronald Reagan.

Prior to fWHR measurement, all images were horizontally aligned and scaled according to inter-pupillary distance. Following the methodology of Carré and McCormick (2008), bizygomatic width was measured as the maximum horizontal distance between the right and left facial boundary; upper-face height was measured as the vertical distance between the highest point of the upper-lip and the highest point of the eyelids. The fWHR was calculated as width divided by height.

2.1.2. Character traits

We utilised Simonton's (1986) psychometric analysis of all former US presidents until Reagan. Personality descriptions were collected for each of the presidents from numerous historical texts, anonymised, rated on the Gough Adjective Scale (Gough & Heilbrun, 1965) by several judges, with item scores then subjected to factor analysis from which 14 factors were retained: Moderation, friendliness, intellectual brilliance, machiavellianism, poise and polish, achievement-drive, forcefulness, wit, physical attractiveness, pettiness, tidiness, conservatism, inflexibility, and pacifism. Of these 14 factors, four were of specific interest here: Achievement-drive (highest factor loadings: persistent = .76; quitting = −.88), forcefulness (highest factor loadings: energetic = .64; active = .63), inflexibility (highest factor loadings: stubborn = .47; rigid = .41) and pacifism (highest factor loadings: peaceable = .61; courageous = −.48), on account of their conceptual overlap with both dominance and aggression.

Table 1
Names and facial width-to-height ratio of the US presidents used in the study.

President	fWHR	President	fWHR
John Quincy Adams	1.99	William H. Taft	2.01
Zachary Taylor	1.86	Woodrow Wilson	1.78
Millard Fillmore	2.04	Warren G. Harding	1.91
Franklin Pierce	1.89	Calvin Coolidge	2.04
James Buchanan	1.88	Herbert Hoover	2.30
Abraham Lincoln	1.93	Franklin D. Roosevelt	1.88
Andrew Johnson	2.18	Harry S. Truman	2.01
Ulysses S. Grant	2.07	Dwight D. Eisenhower	2.04
Rutherford B. Hayes	1.93	John F. Kennedy	2.13
James Garfield	2.06	Lyndon B. Johnson	2.04
Chester A. Arthur	1.80	Richard Nixon	1.91
Grover Cleveland	2.05	Gerald Ford	1.96
Benjamin Harrison	1.88	Jimmy Carter	2.15
William McKinley	1.90	Ronald Reagan	1.98
Theodore Roosevelt	2.03		

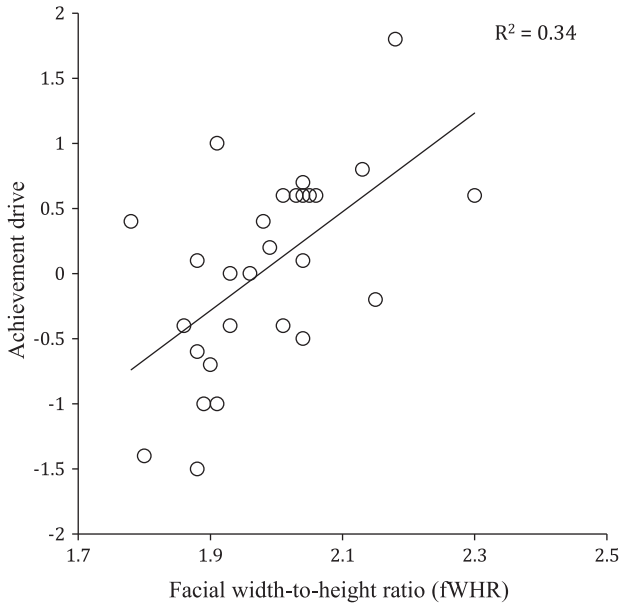

Fig. 2. Association between facial width-to-height ratio and achievement drive in former US presidents.

3. Results

For achievement drive, one datapoint (Grant) was more than four standard deviations from the mean and so was removed from subsequent analyses (no other data point was more than ±1.8 SDs from the mean). fWHR (mean = 1.99, SD = .11) significantly

predicted achievement drive ($r = .58$, df = 26, $p = .001$; see Fig. 2), but not forcefulness ($r = .13$, df = 27, $p = .50$), inflexibility ($r = .17$, df = 27, $p = .38$), or pacifism ($r = -.08$, df = 27, $p = .70$), although these associations were all in the predicted direction. Linear regression was next used to examine the relationship of achievement drive to fWHR, controlling for potential confounds of age at incumbency and rated intellectual brilliance and interactions with age. The overall model was significant ($r^2 = .41$), $F(4, 23) = 5.50$, $p = .005$, with a highly significant independent effect of fWHR ($\beta = .60$, $p = .001$).

The additional 10 factors from Simonton (1986) were analysed in a purely exploratory capacity to investigate further associations with fWHR. Of these, only poise and polish ($r = -.38$, $p < .05$) showed a significant (negative) association with fWHR.

4. Discussion

The current findings relate facial width-to-height ratio (fWHR) to achievement drive in a sample of exceptional political figures: former US presidents. The findings refine and extend recent work indicating fWHR is a morphological marker of dominance-seeking (Carré & McCormick, 2008; Haselhuhn & Wong, 2012). Contrary to prediction, we did not observe an association from fWHR to forcefulness, inflexibility, or pacifism. One possibility for this null finding is that fWHR does not serve as a marker of aggression per se, but is related instead to biological factors influencing striving or capacity for status-achievement. This may reflect the significant association with achievement drive and not with the aggression-linked traits of forcefulness and (low) pacifism. A role in status-seeking would reflect more closely current thinking in endocrinology concerning the behavioral effects of testosterone, a hormone linked to sexually dimorphic traits (e.g. Finkelstein et al., 1997): While testosterone has been linked to aggression (Finkelstein et al., 1997), this link is now argued to be a situationally-contingent manifestation of a broader motivation to achieve status (Eisenegger, Haushofer, & Fehr, 2011; van Honk et al., 2011). For presidents, signs of aggression are likely to be counterproductive – interpreted as a sign of low, rather than high, capacity for status (cf. Furlow, Gangestad, & Armijo-Prewitt, 1998). In contrast, in the sporting arena, aggression may be a more clearly sanctioned method of status achievement (at least in some sports), perhaps reflecting the association of fWHR with aggression in ice-hockey players (Carré & McCormick, 2008).

The natural constraint on the sample size imposes a limitation to this study in that we were unable to detect small effects. Furthermore, it is not clear whether the conclusions of this study generalise to the wider population. Future work utilising larger and more representative samples, as well as extending this work to broader political figures, will be valuable. In addition, we were constrained in the measures of pacifism and forcefulness used. These may not directly assess aggression or dominance but rather be personality concepts linked to sociability and activity. For example, forcefulness had its highest loadings on the items "energetic" and "active", which perhaps reflect trait extraversion (Costa & McCrae, 1992) more so than aggressive forcefulness per se.

In summary, we report the association between the facial width-to-height ratio and individual differences in achievement drive in a sample of former US presidents. These findings extend recent work associating this facial structure to elite political figures and suggest that biology may influence character traits with subsequent political implications.

References

Alford, J. R., Funk, C. L., & Hibbing, J. R. (2005). Are political orientations genetically transmitted? *American Political Science Review, 99*, 153–167.

Carré, J. M., & McCormick, C. M. (2008). In your face: Facial metrics predict aggressive behavior in the laboratory and in varsity and professional hockey players. *Proceedings of the Royal Society B: Biological Sciences, 275*, 2651–2656.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO-PIR) and NEO five-factor inventory professional manual*. Odessa, FL: Psychological Assessment Resources Inc.

Eaves, L. J., & Eysenck, H. J. (1974). Genetics and the development of social attitudes. *Nature, 249*, 288–289.

Eisenegger, C., Haushofer, J., & Fehr, E. (2011). The role of testosterone in social interaction. *Trends in Cognitive Sciences, 15*, 263–271.

Finkelstein, J. W., Susman, E. J., Chinchilli, V. M., Kunselman, S. J., D'arcangelo, M. R., Schwab, J., et al. (1997). Estrogen or testosterone increases self-reported aggressive behaviors in hypogonadal adolescents. *Journal of Clinical Endocrinology and Metabolism, 82*, 2423–2438.

Furlow, B., Gangestad, S. W., & Armijo-Prewitt, T. (1998). Developmental stability and human violence. *Proceedings of the Royal Society B: Biological Sciences, 265*, 1–6.

Gough, H. G., & Heilbrun, A. B. Jr, (1965). *The adjective check list manual*. Palo Alto, CA: Consulting Psychologists Press.

Haselhuhn, M. P., & Wong, E. M. (2012). Bad to the bone: Facial structure predicts unethical behavior. *Proceedings of the Royal Society B: Biological Sciences, 279*, 571–576.

Lewis, G. J., & Bates, T. C. (2011). From left to right: How the personality system allows basic traits to influence politics via characteristic moral adaptations. *British Journal of Psychology, 102*, 546–558.

Martin, N. G., Eaves, L. J., Heath, A. C., Jardine, R., Feingold, L. M., & Eysenck, H. J. (1986). Transmission of social attitudes. *Proceedings of the National Academy of Sciences of the United States of America, 83*, 4364–4368.

Özener, B. (in press). Facial width-to-height ratio in a Turkish population is not sexually dimorphic and is unrelated to aggressive behavior. *Evolution and Human Behavior*. doi:10.1016/j.evolhumbehav.2011.08.001.

Simonton, D. K. (1986). Presidential personality: Biographical use of the gough adjective check list. *Journal of Personality and Social Psychology, 51*, 149–160.

Stirrat, M., & Perrett, D. I. (2010). Valid facial cues to cooperation and trust: Male facial width and trustworthiness. *Psychological Science, 21*, 349–354.

van Honk, J., Terburg, D., & Bos, P. A. (2011). Further notes on testosterone as a social hormone. *Trends in Cognitive Sciences, 15*, 291–292.

Verdonck, A., Gaethofs, M., Carels, C., & de Zegher, F. (1999). Effect of low-dose testosterone treatment on craniofacial growth in boys with delayed puberty. *European Journal of Orthodontics, 21*, 137–143.

Weston, E. M., Friday, A. E., & Lio, P. (2007). Biometric evidence that sexual selection has shaped the hominin face. *PLoS ONE, 2*, 1–8.

Winter, D. G. (2003). Personality and political behavior. In D. O. Sears, L. Huddy, & R. Jervis (Eds.), *Oxford handbook of political psychology* (pp. 110–145). New York: Oxford University Press.

Wong, E. M., Ormiston, M. E., & Haselhuhn, M. P. (2011). A face only an investor could love: CEO facial structure predicts firm financial performance. *Psychological Science, 22*, 1478–1483.