



Core self-evaluations mediate the association between leaders' facial appearance and their professional success: Adults' and children's perceptions

Erik Dietl^{a,*}, Nicholas Rule^b, Gerhard Blickle^c

^a Business and Organizational Psychology, University of Hohenheim, Stuttgart, Germany

^b Department of Psychology, University of Toronto, Toronto, Canada

^c Industrial, Organizational, and Economic Psychology, University of Bonn, Bonn, Germany

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ABSTRACT

Although the link between facial appearance and success is well established, the mechanisms responsible for this association have remained elusive. Evolutionary theory suggests that perceived leadership characteristics should be important for men's self-concept. Drawing on implicit leadership theory and evolutionary perspectives, we therefore examined the associations between first impressions based on facial appearance, core self-evaluations (CSEs), leadership role occupancy, and career success among a sample of working men. In Study 1, we found that CSEs mediated the relationship between individuals' facial appearance and measures of their success as leaders. In Study 2, we replicated these results using children's ratings of facial appearance, thus suggesting that basic properties of the targets' faces communicated their leadership ability more than the perceivers' life experience or acquired knowledge. These results suggest that people may use facial appearance as a diagnostic tool to determine the leadership ability of others.

Parents commonly admonish their children not to judge others based on their appearance but, rather, to look “inside” a person to his or her personality, intelligence, and values. In many cases, this may be sound advice. Yet, in other instances, outside appearance may honestly convey some of what lies underneath. For example, people's basic personality traits (Penton-Voak, Pound, Little, & Perrett, 2006), political opinions (Samochowiec, Wänke, & Fiedler, 2010), intelligence (Zebrowitz, Hall, Murphy, & Rhodes, 2002), and leadership success (Rule & Ambady, 2008) all correlate, albeit weakly, with subjective assessments derived from their facial appearance (cf. Antonakis & Eubanks, 2017). In addition, facial appearance can influence one's career and leadership success in various domains (e.g., Antonakis, 2011; Hosoda, Stone-Romero, & Coats, 2003). The mechanisms responsible for these associations have remained elusive, however.

Here, we sought to more directly map out how leadership relates to facial appearance by testing the link between one's outer appearance and inner self-concept, hypothesizing that individuals' self-concepts would mediate the association between their appearance and leadership success. In two studies, we investigated how self-concept mediates the positive association between both children's and adults' subjective assessments of appearance with working men's professional success, as measured by their leadership role occupancy and occupational status. Doing so produced three key contributions.

First, we answered Baruch and Bozionelos' (2011) recent call for research on the mechanisms linking job-irrelevant human capital and success outcomes by examining core self-evaluations (CSEs; the “fundamental assessments that people make about their worthiness, competence, and capabilities;” Judge, Bono, Erez, & Locke, 2005, p. 257) as a mediator of the positive association between facial appearance and leader's professional success. This allowed us to extend prior work showing that CSEs link individuals' attractiveness to their income by examining how facial appearance relates to leadership attainment via CSEs (Judge, Hurst, & Simon, 2009).

Second, by sampling judgments of leadership from both adults (Study 1) and children (Study 2), we tested and extended theories suggesting that individuals without prior experience can reliably intuit others' leadership ability with the face serving as a diagnostic tool (Spisak, Dekker, Kruger, & Van Vugt, 2012). Concordant results from adults and children would suggest that first impressions based on facial appearance may not completely arise from socialized experience within the work environment but may also stem from a possibly innate sensitivity to detect hierarchical cues. Moreover, if leadership appearance relates to individuals' CSEs, selecting these leaders might suggest a “kernel of truth” in leadership judgments by reflecting internal traits associated with effective leadership and work behaviors (Berry, 1990; Chang, Ferris, Johnson, Rosen, & Tan, 2012; Hu, Wang, Liden, & Sun,

* Corresponding author at: Business and Organizational Psychology, University of Hohenheim, Wollgrasweg 49, 70599 Stuttgart, Germany.
E-mail address: erik.dietl@uni-hohenheim.de (E. Dietl).

2012; Penton-Voak et al., 2006). In addition, by examining how both adults' and children's leadership judgments relate to leadership attainment, we attempted to conceptually replicate previous work on political leaders (Antonakis & Dalgas, 2009), thereby providing a much needed replication of an intriguing finding in another context (i.e., the world of work; see Antonakis, 2017).

Third, although evidence suggests that facial appearance predicts success among political, military, and business leaders, this research has focused almost exclusively on elite leaders (see Re & Rule, 2015, for review). Thus, because empirical studies examining the association between facial appearance and leadership success in the world of work are scarce (limiting the generalizability of prior studies), we tested how facial appearance and leadership outcomes relate among nonelite leaders across a broad variety of jobs and industries, thereby allowing for generalization beyond a specific company or profession. In addition, our study heeds the call that organizational and management research should also focus on “lower-echelon employees” (Bamberger & Pratt, 2010), who represent the majority of people working in organizations.

Facial appearance and leadership

Several recent studies have shown that people can reliably infer leaders' success from mere photos of their faces. Judgments of personality traits (e.g., competence) predict the outcomes of elections in countries on almost every continent (Lawson, Lenz, Baker, & Myers, 2010; Little, Burriss, Jones, & Roberts, 2007; Martin, 1978; Rule et al., 2010; Todorov, Mandisodza, Goren, & Hall, 2005) and correlate with the amounts of profits that chief executive officers (CEOs) earn for their companies (Harms, Han, & Chen, 2012; Rule & Tskhay, 2014). Despite the importance of leadership evaluations (such as deciding for whom to vote), quick and unreflective judgments predict these outcomes better than more thoughtful assessments do (Ballew & Todorov, 2007). More astonishing, even children's subjective judgments of political candidates predict electoral outcomes just as effectively as adults' evaluations do (Antonakis & Dalgas, 2009).

Other studies have suggested that these superficial judgments may probe individuals' actual dispositions. For example, Mueller and Mazur (1996) found that perceptions of West Point cadets' facial dominance predicted their military ranks at the ends of their careers. Similarly, perceptions of corporate lawyers' personality traits in college predicted their accomplishments as leaders of their firms as much as 50 years later (Rule & Ambady, 2011).

Implicit leadership theory (ILT; Lord, Foti, & De Vader, 1984) may help to explain why facial appearance relates to leadership success outcomes. The theory explains how leaders emerge, why someone is accepted as a leader, and why a leader can exert influence upon others. Individuals' ILTs refer to representations nonconsciously held by followers that help discriminate “leaders” from “non-leaders” and facilitate instant assessments of the leadership qualities of another person (Shondrick & Lord, 2010). Observers use these prototypes to automatically determine whether a leader matches their prototypical expectations. Individuals who match the leader prototype are considered more favorably and can emerge more easily as leaders (Lord et al., 1984). Consistent with these arguments, research has shown that first impressions of leadership from faces were higher when facial appearance and expressions matched the observers' prototypes (Trichas & Schyns, 2012). Furthermore, ILTs guide judgments of leadership from nonverbal cues, which relate to measures of leaders' success (Tskhay, Xu, & Rule, 2014).

People with good ideas frequently struggle to implement them because they cannot inspire others to follow them or adopt their ideas. Leadership may thus require the ability to entrain other people towards compliance, commitment, and positive affect (Pfeffer, 1981). Yet, despite these important functions, individuals' height, sex, or facial appearance may influence whether others view them as leaders (e.g., Elgar, 2016; Re et al., 2013). Thus, prototypical images of a leader,

rather than substantive evaluations of their skills, may shape followers' perceptions of whether someone is worth following. Followers' and observers' perceptions of faces and their attributions of leadership qualities are influenced by ILTs as well (e.g., Antonakis, 2011; Trichas & Schyns, 2012). Therefore, favorable leader perceptions based on one's face may relate to an individual's leadership success. Taken together, perceptions of leadership ability from the face (whether through direct assessments of how effective a leader looks, or indirectly through judgments of traits like competence and dominance) correlate with elite leaders' success. In an attempt to replicate prior work, we therefore expected:

Hypothesis 1. Perceptions of leadership from the face positively relate to leadership role occupancy and career success for people working at various levels of leadership within an organization.

Facial appearance, core self-evaluations, and success

Job-irrelevant human capital denotes individual characteristics that logically should not relate to job performance but that nonetheless seem to influence career success (Baruch & Bozionelos, 2011). Facial appearance is a typical example of job-irrelevant human capital that nevertheless relates to career success and leadership emergence (Antonakis & Eubanks, 2017; Hosoda et al., 2003). Hence, understanding the mechanisms that mediate the association between facial appearance and workplace outcomes can expand models seeking to predict organizational efficiency and productivity.

The mechanisms responsible for these associations have remained elusive, however. We contend that favorable perceptions of a face may not only relate to an individual's leadership success, but may also influence that person's self-concept. For instance, an attractive appearance can elicit positive expectations and stereotypes (Dion, Berscheid, & Walster, 1972), and these positive impressions can turn into self-fulfilling prophecies whereby one gradually adopts the traits and behaviors that others expect, allowing the person to develop a favorable self-concept (e.g., higher self-esteem, self-efficacy; Antonakis, 2011; Langlois et al., 2000; Rosenthal & Jacobson, 1968; Snyder, Tanke, & Berscheid, 1977). Indeed, Judge, Hurst, & Simon (2009) found that CSEs mediated the association between individuals' attractiveness and their income. In this vein, we investigated whether CSEs might similarly mediate the relationship between perceptions of leadership from facial appearance and two measures of leadership success: leadership role occupancy and occupational status.

Though often considered a stable trait, experiences can also influence CSEs (Nübold, Muck, & Maier, 2013; Wu & Griffin, 2012). Extending and building on prior work on facial appearance and self-concept, we thus propose that perceptions of leadership from the face (e.g., competence, trustworthiness) should positively influence individuals' global self-concept in three ways. First, observers (e.g., coworkers, clients, supervisors, mentors) might treat individuals as if leader-like facial features reliably indicate their true underlying skills and, consequently, trust them more (Rezlescu, Duchaine, Olivola, & Chater, 2012). This positive treatment is likely to have a strong influence on global self-worth (Harter, 2006). Second, individuals who look leader-like might be treated and accepted as leaders more often, positively affecting their CSEs and providing them more opportunities to develop their (leadership) skills—in other words, a self-fulfilling prophecy (e.g., Antonakis, 2011; Friedman & Zebrowitz, 1992; Rule & Ambady, 2011). Consistent with these ideas, individuals with the right look may be more confident in their abilities and more likely to be considered leaders (DeRue & Ashford, 2010; Judge, Hurst, & Simon, 2009; Mobius & Rosenblat, 2006). Third, having a facial appearance that garners impressions of high status and leadership should correlate with a positive global self-concept, especially among men. Indeed, evolutionary models of mate selection suggest that men must advertise their status and resources to succeed in mating because women seek

these qualities in potential mates (Buss, 1989; Li, Bailey, Kenrick, & Linsenmeier, 2002). Accordingly, Campbell and Wilbur (2009) found that status-related attributes (e.g., having a good job, being financially secure, seeking status) importantly influenced men's self-concepts. These qualities should therefore contribute to the development of higher CSEs when a man's face signals status and resources, as through the appearance of leadership, which should prompt reactions from others that positively impact their CSEs (Betzig, 1993; Buss, 2005). Taken together, we therefore hypothesized:

Hypothesis 2. Perceptions of leadership from the face positively relate to CSEs.

Moreover, we expected that CSEs would mediate the positive association between perceptions of leadership and career success. Along these lines, Chang et al.'s (2012) meta-analysis showed that people with higher CSEs performed better at their jobs and enacted fewer harmful behaviors against their organizations and fellow employees. They further found that CSEs positively correlated with individuals' income, suggesting that greater CSEs may encourage occupational status and higher leadership role occupancy (see also Judge, Bono, Ilies, & Gerhardt, 2002; Li, Arvey, & Song, 2011). Men perceived as better leaders may therefore achieve greater career success (e.g., occupational status) and better leadership roles because they develop a more positive global self-concept (i.e., have higher self-esteem, self-efficacy, a stronger internal locus of control, and emotional stability). We therefore hypothesized:

Hypothesis 3. CSEs mediate the positive association between perceptions of leadership from the face and both (a) leadership role occupancy and (b) career success.

Face perception and evolutionary mechanisms

General adaptive mechanisms of face perception, and more specific mechanisms of leadership perception, suggest that humans may have innate mechanisms to quickly recognize others' leadership ability (Short et al., 2012; Spisak, Dekker, et al., 2012). Because both children and "naïve" undergraduates can reliably predict meaningful leadership outcomes, it appears that individuals without leadership experience in an employment setting can reliably intuit others' leadership ability and that the face serves as a diagnostic tool in these judgments (e.g., Antonakis & Dalgas, 2009). To test this, we sampled leadership judgments from both adults (Study 1) and children (Study 2) to investigate whether individuals' ability to detect leadership success from leaders' faces arises from the experience of working with leaders (i.e., the correlation emerges only for adults' judgments) or from a more basic sensitivity to cues that signal leadership (i.e., the correlation emerges for both adults' and children's judgments). Moreover, given that CSEs reflect valid leadership abilities and relate to effective work behaviors (Chang et al., 2012; Hiller & Hambrick, 2005; Hu et al., 2012; Judge, Piccolo, & Kosalka, 2009), establishing that CSEs mediate the relation between perceived leadership judgments and actual leadership success may suggest that perceivers reliably detect kernels of truth about leaders' abilities from their faces.

Several studies have suggested that people evolved acuity in interpersonal perception to help them resolve recurrent social problems, such as detecting aggression and other related threats to mating and survival (Sell et al., 2009; Short et al., 2012; Spisak, Dekker, et al., 2012). Due to their critical survival-enhancing contributions, these mechanisms may function independently of prior experience (e.g., Spisak, Dekker, et al., 2012). For example, estimates of aggression made by untrained adults and 8-year-old children correlated with aspects of male facial structure related to actual aggressive behavior (Short et al., 2012). People may possess similar mechanisms for perceiving leadership. Van Vugt, Hogan, and Kaiser (2008) have suggested that leadership might have evolved as a strategy for resolving problems such as

group movement, intragroup conflict, and intergroup competition. Successes and failures of leadership might therefore create enough variation between groups that natural selection for leadership could operate at the group level under certain conditions (e.g., if resources were scarce and well-led groups performed better at hunting, food-sharing, and warfare; Wilson, Van Vugt, & O'Gorman, 2008). Faster and more effective group coordination can be essential in emergencies and lead to a first-mover advantage when exploiting resources or attacking other groups (Van Vugt et al., 2008). Identifying individuals with the competence and expertise for leadership can thus have high value, promoting cognitive mechanisms for doing so (see Lord et al., 1984; Spisak, Dekker, et al., 2012; Spisak, Homan, Grabo, & Van Vugt, 2012).

Leadership categorization theory thus posits that individuals resembling the leader prototype are more likely to emerge as leaders (Lord et al., 1984), to which Spisak, Homan, et al. (2012) added the suggestion that leader prototypes evolved to include both psychological (e.g., socialized and culturally-specific ILTs) and physical markers (e.g., the face). Categorizing leaders versus nonleaders from their faces could therefore facilitate leader emergence across situations and in specific contexts (e.g., Bøggild & Laustsen, 2016; Laustsen & Petersen, 2017; Little et al., 2007); for instance, masculine and feminine facial cues facilitate leader emergence during intergroup conflict and cooperation, respectively (e.g., Spisak, Homan, et al., 2012).

Current work

We tested our three hypotheses across two cross-sectional field studies. In Study 1, we investigated whether CSEs mediated the anticipated positive associations between individuals' facial appearance and two measures of their success as leaders (leadership role occupancy and career success) via direct assessments of leader choices based on the face. In addition, we collected trait judgments (e.g., trustworthiness, dominance) to explain adults' leadership preferences. In Study 2, we extended and generalized this mediation model by replicating it with a sample of child participants. Overall, we sought to measure whether perceptions of leadership predict the success of nonelite leaders from a working population and to test the role that CSEs might play in linking perceptions of leadership ability to actual leadership success. Studying these judgments within an unconventional and working population should permit greater generalization of leadership theory to diverse settings. Moreover, corroborating such an association with children could help to buttress the potentially inherent basis for the cognitive-perceptual mechanisms supporting this link, thereby helping to establish the fundamental nature of leadership perception among both targets and perceivers.

Study 1

Method

Stimuli

Target persons worked across a broad range of occupations and industries. They were at least 29 years old because leadership and career success need time to evolve in the world of work and most adults have entered the labor force in Germany by 29 years of age (Wingerter, 2011). All targets shared handball sports as a common interest and were similarly active handball players or coaches, allowing us to roughly equate physical fitness and its correlates in our target sample (see Ehrenspiel & Strahler, 2012).¹ As mentioned above, this unconventional context allows for generalization of leadership theory to a broader context than past studies, which have focused predominantly on elite leaders in high-status corporate and political positions.

¹ Interested readers may also wish to consult Elgar's (2016) study of how physical stature relates to leader performance in Olympic and Paralympic teams.

We collected two head-shot photos of each of 130 Caucasian ($M_{\text{age}} = 46.00$ years, $SD = 7.81$) male players, who were either A-level coaches or players on senior teams (i.e., older than 29 years) within the German Handball Association. A-level coaches (who hold the top coaching license of the German Handball Association) were contacted through workshops, whereas senior players were contacted through their team coaches. The targets displayed a simple neutral expression in one of the photos. For the other photo, we instructed each target to present himself as a successful coach, taking as many as 10 photos and asking him to choose the one he thought best represented him as a leader by displaying the photos on the screen of the digital camera (henceforth referred to as the “impression-management” photo). We asked each person to take off his glasses and wear a cloak to obscure any clothing. Afterward, we standardized each photo's size so that the height from the chin to the top of the head was uniform across targets and converted each photo to grayscale to control for differences in lighting.

Measures

Core self-evaluations

We measured targets' global self-concept with the German-validated version of the Core Self-Evaluations Scale (CSES; Judge, Erez, Bono, & Thoresen, 2003; Stumpp, Muck, Hülshager, Judge, & Maier, 2010). The CSES contains 12 self-report items with a response scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include *When I try, I generally succeed* and *Overall, I am satisfied with myself* (see Appendix A for all items). The internal consistency of the CSES was acceptable ($\alpha = .72$).

Occupational status

Occupational status reflects the amount of power, prestige, and authority that society ascribes to a particular profession (e.g., Schooler & Schoenbach, 1994). We asked targets to assess their occupational status from 1 (*unskilled worker*) to 15 (*proprietor of a large company*) using a scale frequently employed in sociology and organizational behavior that is very similar to the Occupational Scale of Hollingshead's Index of Social Position (see Blickle et al., 2011; Dietl, Meurs, & Blickle, 2017; Hartmann, 2002; Miller & Salkind, 2002). Although self-reports of career success strongly correlate with objective measures from archived company data (Judge, Cable, Boudreau, & Bretz, 1995), we validated the association by manually coding a random subsample of 17 targets' reported professions using the International Standard Classification of Occupations 2008 (ISCO-08; Züll, 2016) to calculate two indicators of occupational status: the International Socio-Economic Index (ISEI) of occupational status (Ganzeboom, 2010) and the Standard Occupational Prestige Scale (SIOPS, Ganzeboom & Treiman, 2003; Treiman, 1977). Both indices strongly correlated with the self-reported occupational status scale: $r(15) = .63$, $p = .006$, and $r(15) = .70$, $p < .001$, respectively). Both the target's occupational status and leadership role (described below) referred to full-time jobs that were *outside* the sports leisure activity through which they were recruited, except for 10 targets who worked full-time as professional coaches.

Leader role occupancy

We measured the leadership role that each individual occupied with a scale consisting of different hierarchical levels in organizational leadership. Specifically, targets reported their management level from 1 (*no leadership position*) to 5 [*upper management level (executive board)*]. Previous research using this scale (Blickle, Witzki, & Schneider, 2009) revealed positive associations between the respondents' scores and their salary, $r(279) = .30$, $p < .001$, hierarchical position within their company (0% = bottom, 100% = top), $r(300) = .51$, $p < .001$, and number of employees that they supervise, $r(285) = .24$, $p < .001$.²

² Based on reanalysis of original published data; full results available from the first author.

Control variables

Because working as a Professional Coach might relate to CSEs, occupational status, and leadership, we modeled our data with and without controlling for whether each target worked full time as a Professional Coach using a dummy variable (0 = not a professional coach; 1 = professional coach; see Becker et al., 2016).³

Participants

In order to sample participants from a homogeneous context, we contacted active and former handball players via invitations to follow links to an online survey. Participants were recruited either personally at their sports clubs or via public postings in online social networks and forums frequently used by handball players. A total of 366 participants started the survey and 276 (194 male, 82 female; $M_{\text{age}} = 29.73$ years, $SD = 11.33$) completed the online questionnaire (completion rate 75.4%). Of these, 168 (60.8%) came from the working population, 71 (25.7%) were undergraduates, 33 (12.0%) were students at other levels, and four (1.4%) were occupied in some other way.

Procedure

We created an online survey using Inquisit 3.0.5.0 (2011). To keep the online study brief, we split the 260 photos into twelve sets following a 2 (photo type: neutral, impression-management) \times 6 (target age: 29–39 years, 39–42 years, 43–46 years, 46–49 years, 49–54 years, and 54–65 years) between-subjects design with 22 photos in each set. Two targets (aged 39 and 46 years) appeared in two of the sets to yield equal numbers per set and because including them twice assured that we could accrue sufficient judgments from people who did not recognize them, as they were relatively famous handball coaches (indeed, we excluded 204 ratings of these targets for a total of 633 and 429 valid ratings). Moreover, the 46–49 year age set and 54–65 year age set overlapped with the 49–54 age set. In these cases, we randomly assigned three of the five 49 year-old targets and two of the four 54 year-old targets to one or the other group. Grouping the targets by age prevented age-related contrasts that might have affected participants' judgments (e.g., Krendl, Rule, & Ambady, 2014; see also Biernat & Manis, 1994).

We randomly assigned approximately 23 participants to rate one of the 12 sets of photos. The participants viewed all 22 faces in random order, blocked by rating type. Two of the blocks assessed leadership. In one, we asked the participants to “Imagine that you are playing on a capable team. Next season, your team could ascend to a higher league. You just need a good new coach. Several people introduce themselves. You get to co-decide who will be considered for preselection and could be your new coach. Should this person be considered for preselection?” and then rate each face on a 4-point scale from 1 (*Certainly not*) to 4 (*Definitely yes*). In the other, we asked them to “Imagine that you are working in a company. Because your department has been very successful, your supervisor has been promoted. The vacancy needs to be filled now. Several people introduce themselves. You get to co-decide who will be considered for preselection and could be your new supervisor. Should this person be considered for preselection?” using the same scale. The two leadership judgments correlated very strongly for both the neutral, $r(128) = .82$, $p < .01$, and impression-management photos, $r(128) = .80$, $p < .01$. We therefore averaged the ratings and refer to this composite variable as Choice as Leader.

Following this, the participants rated the faces along several trait dimensions (attractiveness, competence, dominance, facial maturity, likeability, strength of leadership, and trustworthiness) from 1 (*Not at all X*) to 7 (*Very X*) in random order. We selected these traits based on a multitude of previous studies implicating their importance for perceptions of leadership from faces (e.g., Rule & Ambady, 2008). Finally, the

³ The targets completed a variety of measures in addition to those reported here; see Appendix B for a full list of all questions asked.

participants viewed each photo and indicated whether they recognized the person from outside the study. Consistent with prior research (e.g., Rule & Ambady, 2008), we were interested in naïve judgements and therefore removed the data for recognized faces prior to analysis (10.1% of all trials). In addition, we removed data from blocks in which the participant gave identical ratings to every target (i.e., participants who did not follow the instructions and/or who finish the study quickly), and excluded in toto data from participants who provided strings of identical ratings in at least one third of the blocks (3.3% of all trials).⁴

Estimation strategy

We calculated single- and average-score intraclass correlation coefficients (ICC1, ICC2; Bliese, 1998, 2000) to justify aggregating the judgments of the targets for each rating.⁵ We found a high degree of inter-rater agreement (all ICC2s > .80; see Table 1). The judgments of the neutral and impression-management photos significantly correlated for the Choice as Leader composite, $r(128) = .73, p < .01$, and all of the trait ratings, $r_s(128) \geq .57, p_s < .01$; thus, we averaged the ratings for each judgment across the two photo types (see the Supplemental Materials for results decomposed for the two photo types separately).

We conducted a principal components analysis with varimax rotation for the participants' trait ratings (i.e., competence, dominance, facial maturity, likeability, strength of leadership, and trustworthiness). We did not include attractiveness because it would highly correlate with the trait inferences and leadership ratings (due to common source and method effects; Antonakis, Bendahan, Jacquart, & Lalive, 2010; Podsakoff, MacKenzie, & Podsakoff, 2012), following previous research (Rule et al., 2010). Ratings of likeability and trustworthiness loaded together into a factor we named Warmth, and ratings of dominance and facial maturity loaded together into a factor we named Power (see Table 2 for factor loadings). Competence and strong leadership loaded highly on both Power and Warmth, however. Consistent with prior research (Rule et al., 2010), we therefore decided to remove competence and strong leadership from the exploratory analyses. We averaged the mean scores for each target into the composite variables: Power (dominance and facial maturity) and Warmth (likeability and trustworthiness).

Because we nested the targets' aggregated appearance ratings (Level-1) within photo sets (Level-2), we used a cluster-robust maximum likelihood (MLR) estimator with robust variance estimates to account for the nonindependence using Mplus 7.3 (Muthén & Muthén, 2012) and modeled the data using a mediation framework in which CSEs mediated the association between the Choice as Leader ratings and the outcomes (occupational status leadership role).

Although CSEs are often considered a trait, physical appearance and other variables (e.g., general mental ability and work experiences) may influence them (Judge, Hurst, & Simon, 2009; Wu & Griffin, 2012). One's occupational status or leadership role might even influence a person's CSE and self-efficacy (a component of CSEs considered state-like and malleable to mastery experience and social modeling; Bandura, 1986). The hypothesized mediation model may therefore be partly influenced by other omitted causes and the mediating variable (CSEs) is likely endogenous (Antonakis et al., 2010; Judge, Hurst, & Simon, 2009; Wu & Griffin, 2012), potentially leading to inconsistent parameter estimates. In addition, CSEs could also be endogenous because they share

⁴ The participants rated the likelihood that each person is an employee or leader, and the likelihood that each person is a player or coach prior to the recognition question. We also asked participants to self-report their education level, occupation, sports club, and sports league alongside the other demographic variables before rating the targets. These variables were exploratory and thus not included in the present analyses.

⁵ Given that participants rated only some of the targets, we could not compute the indices $ICC(C,1)$ and $ICC(C,k)$ – known as Cronbach's alpha – which control the inter-rater variance and usually produce larger coefficients. For this reason, our reliability indices are probably underestimated (McGraw & Wong, 1996).

Table 1
Intraclass correlation coefficients of adult's (Study 1) and children's (Study 2) ratings of the targets' overall (combined) photo scores.

	Overall photo scores		
	ICC1	ICC2	k
Adults' ratings (Study 1)			
Leadership preferences			
Preselection as coach	.20	.91	39.36
Preselection as supervisor	.21	.91	39.74
Choice as leader composite ^a	.28	.94	38.65
Trait inferences			
Competence	.19	.90	39.32
Dominance	.18	.90	39.87
Facial maturity	.18	.91	38.85
Likeable	.21	.92	40.15
Trustworthiness	.17	.89	39.48
Strong leadership	.20	.91	39.62
Children's ratings (Study 2)			
Leadership ratings			
Calms sailors down	.07	.72	35.15
Chooses a good passage	.06	.70	35.11
Explains what to do	.07	.73	35.13
Looks like a captain	.08	.76	35.28
Preselection as captain	.08	.74	34.18
Leadership composite ^b	.12	.83	36.10

Note. $N = 130$ targets in each condition.

ICC1 = Single-score intraclass correlation coefficient, ICC2 = Average-score intraclass correlation coefficient; k = Average number of raters contributing to the mean for each target.

^a An average score consisting of the two leadership ratings listed above.

^b An average score consisting of the five leadership ratings listed above.

Table 2
Factor loadings and variance explained for principal components analyses in Study 1.

Trait inferences	Warmth	Power
Dominance	.14	.94
Facial maturity	.09	.86
Likeable	.97	.09
Trustworthiness	.95	.18
Competence	.76	.62
Strong leadership	.53	.81
Variance explained	45.4%	44.8%

Note. The values in bold indicate high factor loadings on either the factor Warmth or Power.

omitted common-method variance with the outcomes, which were rated by the same source (Antonakis et al., 2010).

To guard against endogeneity bias, we therefore used an instrumental-variable (IV) estimation method to obtain consistent parameter estimates for our potentially endogenous mediator variable (i.e., CSEs) using maximum likelihood estimation in Mplus 7.3 (Muthén & Muthén, 2012; see also Antonakis et al., 2010; Shaver, 2005). We correlated the disturbance of the CSEs with the disturbances of the dependent variables (i.e., leadership role and occupational status) and regressed the outcomes on the mediator CSEs. Stable individual differences can serve as instruments so long as they are mostly exogenous (i.e., depend on genes and are not influenced by other variables) and no selection has taken place on them (Antonakis, 2011; Antonakis et al., 2010). We therefore used targets' age and Choice as Leader ratings to purge the CSEs of endogeneity bias (see Table 3 for descriptive statistics and correlations for all variables).

Results

Consistent with Hypothesis 1, cluster-robust regressions revealed that the targets' Choice as Leader scores positively related to their actual leadership role ($B = 0.72, SE = 0.27, p = .006$; Table 4, Model 3a)

Table 3
Means, standard deviations, and correlations of variables in Study 1.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Choice as leader	2.31	0.39							
2. Warmth	3.85	0.71	.90**						
3. Power	4.26	0.63	.54**	.27**					
4. Age	46.00	7.81	.04	-.14	.13				
5. Professional Coach status	0.08	0.27	.12	.07	.12	.06			
6. Core self-evaluations	3.83	0.42	.16	.17	.03	.12	.11		
7. Occupational status	7.17	2.88	.24	.18	.13	.18*	.24**	.30**	
8. Leadership role	2.65	1.39	.20	.17	.02	.18*	.16	.22*	.49**

Note. *N* = 130.

We used a cluster-robust variance estimator in the predictive models and do not report significance levels for the relations between appearance and age, Professional Coach status, core self-evaluations, occupational status, and leader role because these correlations do not correct for the clustering by photoset (Antonakis et al., 2010).

* $p \leq .05$.

** $p \leq .01$.

and occupational status ($B = 1.80$, $SE = 0.42$, $p < .001$; Table 4, Model 5a), regardless of whether the Professional Coach dummy variable was included (leadership role: $B = 0.67$, $SE = 0.27$, $p = .01$, Model 3b; occupational status: $B = 1.62$, $SE = 0.37$, $p < .001$, Model 5b). Moreover, Choice as Leader also positively related to CSEs ($B = 0.17$, $SE = 0.05$, $p = .001$; Table 4, Model 1a), regardless of whether the Professional Coach dummy variable was included ($B = 0.16$, $SE = 0.05$, $p = .002$; Table 4, Model 1b), supporting Hypothesis 2.

Instrumental-variable mediation analyses

Table 4 presents the summary of the path estimates for the IV-estimator regression models (Models 2a, 2b, 4a, 4b, 6a, 6b). CSEs significantly related to leadership role ($B = 4.61$, $SE = 2.01$, $p = .02$) and occupational status ($B = 10.57$, $SE = 4.35$, $p = .02$), regardless of whether the Professional Coach dummy variable was included (leadership role $B = 4.60$, $SE = 2.05$, $p = .03$; occupational status $B = 10.21$, $SE = 4.26$, $p = .02$). Cluster-robust mediation analyses testing Hypothesis 3 showed that CSEs mediated the positive associations between the Choice as Leader judgments and both success criteria: actual leadership role (indirect effect = 0.74, $SE = 0.18$, 95% CI [0.39, 1.10]; Table 4, Models 2a, 4a) and occupational status (indirect effect = 1.71, $SE = 0.32$, 95% CI [1.08, 2.33]; Table 4, Models 2a, 6a), regardless of whether the Professional Coach dummy variable was included (leadership role indirect effect = 0.69, $SE = 0.19$, 95% CI [0.33, 1.06]; Table 4, Models 2b, 4b; occupational status indirect effect = 1.54, $SE = 0.29$, 95% CI [0.97, 2.10]; Table 4, Models 2b, 6b). In addition, both correlations between the disturbances of CSEs with leadership role ($\Psi = -0.67$, $SE = 0.31$, $p = .03$) and with occupational status ($\Psi = -1.47$, $SE = 0.66$, $p = .03$) were significant, regardless of whether the Professional Coach dummy variable was included. This indicates that CSEs are indeed endogenous and supports our use of instruments to obtain consistent estimates for the endogenous variable (Antonakis et al., 2010). Overidentification tests indicated that the mediation models fit the data well [$\chi^2(2) = 0.18$, $p = .92$; with Professional Coach dummy: $\chi^2(2) = 0.17$; $p = .92$]. The modification indices of the mediation models showed that none exceeded the minimum value, suggesting that our models fit the data well.

Exploratory analyses with trait inferences

The Choice as Leader judgments strongly associated with both Power, $r(128) = .54$, $p < .001$, and Warmth, $r(128) = .90$, $p < .001$. Cluster-robust regressions moreover showed that the targets' Warmth scores positively related to their actual leadership roles ($B = 0.33$,

$SE = 0.14$, $p = .02$), occupational status ($B = 0.73$, $SE = 0.17$, $p < .001$), and CSEs ($B = 0.10$, $SE = 0.03$, $p = .004$), whereas Power did not significantly relate to any of these (all $|B|s < 0.57$, all $|SE|s < 0.50$, all $ps > .20$). We again conducted instrumental variable mediation analyses, as described above, using the respective appearance ratings and targets' ages as instruments for their CSEs. CSEs mediated the positive associations between the Warmth judgments and both success criteria: actual leadership role (indirect effect = 0.41, $SE = 0.11$, 95% CI [0.19, 0.62]) and occupational status (indirect effect = 0.86, $SE = 0.13$, 95% CI [0.61, 1.12]). Yet, CSEs did not mediate the associations between Power and either success criterion (both indirect effect $|s| < 0.27$, $|SE|s < 0.53$, 95% CIs [-0.19, 0.42]).

Discussion

The results of Study 1 confirmed that people who look more like leaders have higher occupational status and leadership roles, and that targets' CSEs mediated the associations between perceptions of their leadership and these measures of their success. Thus, looking leader-like seems central to men's positive self-evaluations and might be important for men's CSEs because it communicates status and resources, which evolutionary theories suggest may hold value for men (e.g., Campbell & Wilbur, 2009; Li et al., 2002). Indeed, looking leader-like is strongly related to inferences of Power but also to inferences of Warmth.

Although people may learn to associate particular appearances with leadership and status through socialization, the predisposition to use scant facial information to evaluate others may form early in childhood (Cogsdill, Todorov, Spelke, & Banaji, 2014). Children's leadership ratings of faces likewise predicted politicians' electoral success in one study (Antonakis & Dalgas, 2009). These findings suggest that the perception of leadership (and possibly the selection of leaders) might arise from basic processes that operate without socialization. Furthermore, if leadership appearance relates to individuals' CSEs, then it might suggest that faces reflect internal traits associated with effective leadership behaviors (Hu et al., 2012). Thus, if children's face-based leadership judgments also relate to targets' CSEs and leadership success, then it would suggest that the processes involve elements that do not wholly rely on socialization, supporting their basic and adaptive nature. We therefore addressed this possibility in Study 2.

Study 2

In Study 2, we investigated whether children's leadership ratings would predict targets' CSEs and leadership success. If children's leadership ratings positively relate to targets' occupational status, leadership role, and CSEs like adults' ratings did in Study 1, then one may infer that leadership perception relies on a basic process that does not necessarily require workplace socialization, and that both adults and children may use similar heuristics to perceive leadership from faces.

Method

Participants

We recruited 878 children to participate in Study 2: 469 at University of Bonn during the German Unity Day celebrations, and another 409 from grades 3–6 at seven schools in a leading economic region of Germany. Of these, 12 children could not complete the task due to technical problems; we excluded another 47 from analysis for providing identical ratings in more than half of the task blocks. The excluded children ($M = 9.19$ years, $SD = 1.84$) were younger than those remaining in the sample [$M = 10.40$ years, $SD = 1.88$; $t(864) = 4.29$, $p < .001$, $r_{\text{effect size}} = .14$], likely because younger children may have had more trouble paying attention throughout the study. The two groups did not differ in gender [28 boys and 19 girls excluded, 460 boys and 359 girls in the final sample: $\chi^2(1$,

Table 4
Unstandardized regression coefficients, corresponding standard error estimates, and test statistics for predicting core self-evaluations, actual leadership role, and occupational status in Studies 1 and 2.

	Study 1: adults						Study 2: children					
	Core self-evaluations			Core self-evaluations			Core self-evaluations			Core self-evaluations		
	Model 1a	Model 1b	Model 2a	Model 2b	Model 2a	Model 2b	Model 1a	Model 1b	Model 2a	Model 2a	Model 2b	
Choice as leader/leadership	0.17**	0.16**	0.16**	0.15**	0.16**	0.15**	0.34**	0.34**	0.30**	0.30**	0.30**	
Age			0.01*	0.01*	0.01*	0.01*			0.01*	0.01*	0.01*	
Professional Coach status		0.14*		0.13†		0.13†		0.14			0.13	
Model significance:	10.24** [1]	18.97** [2]	8.25** [2]	33.64** [3]	8.25** [2]	33.64** [3]	10.35** [1]	11.60** [2]	11.73** [2]	11.73** [2]	12.84** [3]	
Wald χ^2 [df]												
Explained variance R ²	0.025	0.033	0.037	0.044	0.037	0.044	0.074	0.082	0.083	0.083	0.090	
Instrument strength:			8.25* [2]	10.80** [2]	8.25* [2]	10.80** [2]			11.73** [2]	11.73** [2]	11.26** [2]	
Wald χ^2 [df]												
LR test vs. cons dist:									6.40* [2]	6.40* [2]	6.02* [2]	
χ^2 [df]												
	Actual leadership role						Actual leadership role					
	Model 3a	Model 3b	Model 4a	Model 4b	Model 4a	Model 4b	Model 3a	Model 3b	Model 4a	Model 4a	Model 4b	
Choice as leader/leadership	0.72**	0.67*	0.67*	0.60*	0.61*	0.60*	0.81*	0.78*	2.99*	2.99*	2.92*	
Core Self-Evaluations				0.05		0.05					0.33	
Professional Coach status		0.69**		9.30** [2]		9.30** [2]		0.75†			7.81* [2]	
Model significance:	7.42** [1]	27.57** [2]	5.29* [1]	9.30** [2]	5.29* [1]	9.30** [2]	5.06* [1]	8.10* [2]	5.94* [1]	5.94* [1]	7.81* [2]	
Wald χ^2 [df]												
Explained variance R ²	0.041	0.059	0.050	0.050	0.050	0.050	0.037	0.059	0.050	0.050	0.054	
Disturbance correlation			-0.67*	-0.67*	-0.67*	-0.67*			-0.39†	-0.39†	-0.38†	
Indirect effect via CSEs			0.74**	0.69**	0.74**	0.69**			0.91**	0.91**	0.87**	
	Occupational status						Occupational status					
	Model 5a	Model 5b	Model 6a	Model 6b	Model 6a	Model 6b	Model 5a	Model 5b	Model 6a	Model 6a	Model 6b	
Choice as leader/leadership	1.80**	1.62**	1.62**	10.21*	1.62**	10.21*	1.54*	1.43†	5.82*	5.82*	5.50*	
Core self-evaluations				0.85		0.85					1.62	
Professional Coach status		2.25*		7.49* [2]		7.49* [2]		2.43**			11.78** [2]	
Model significance:	18.58** [1]	20.37** [2]	5.91* [1]	7.49* [2]	5.91* [1]	7.49* [2]	4.21* [1]	11.63** [2]	6.04* [1]	6.04* [1]	11.78** [2]	
Wald χ^2 [df]												
Explained variance R ²	0.059	0.102	0.090	0.097	0.090	0.097	0.031	0.082	0.090	0.090	0.111	
Disturbance correlation			-1.47*	-1.42*	-1.47*	-1.42*			-0.65	-0.65	-0.61	
Indirect effect via CSEs			1.71**	1.54**	1.71**	1.54**			1.76**	1.76**	1.65**	

Note. N = 130 targets. Standard error estimates in parentheses. Models estimated with cluster robust standard errors (due to photoset nesting) using maximum likelihood in Study 1. We used an instrumental variable estimator to obtain consistent estimates for core self-evaluations predicting the outcomes (Models 4a, 4b, 6a, 6b) by using choice as leader (Study 1) or leadership (Study 2) and age as instruments. In Models 4a, 4b, 6a, and 6b, we calculated R² by squaring the correlation of y with its predicted value \hat{y} (Antonakis et al., 2010). CSEs: Core self-evaluations. LR Test vs. Cons Dist: Likelihood ratio test vs. a model with constrained disturbances.

† p < .10.

* p < .05.

** p < .01 (or 99% CI > 0).

Table 5
Factor loadings and variance explained for principal components analysis in Study 2.

Trait inferences	Leadership factor
Calms sailors down	.92
Chooses a good passage	.91
Explains what to do	.95
Looks like a captain	.87
Preselection as captain	.90
Variance explained	82.6%

$N = 819$) = 0.21, $p = .66$, $\phi = .02$] or whether they enjoyed the study [excluded children: $M = 4.45$, $SD = 0.77$; vs. remaining children: $M = 4.49$, $SD = 0.71$, on a scale from 1 (*Certainly not!*) to 5 (*Yes, sure!*); $t(863) = -0.45$, $p = .65$, $r_{\text{Effect Size}} = .02$].⁶ All parents provided oral or written informed consent for their children's participation.

Procedure

Children participated in groups of up to seven in the laboratory. An experimenter guided the children to sit in front of a laptop computer running *Inquisit 3.0.5.0* (2011) and listen to the instructions through headphones while they simultaneously read them on the computer's screen. Before asking the children to rate the photos, we presented them with an animated story in which a ship's captain displayed several leadership behaviors and accomplished leadership tasks that included personnel selection, motivating the sailors on the ship, giving directions, and making decisions. These tasks were based on leadership functions described by Mintzberg (1975) and the story was pre-tested and modified several times to assure that it matched the general level of understanding for children in the age range tested.

To keep the study brief, every child provided ratings for only six photos randomly chosen from either the 130 neutral or 130 impression-management photos used in Study 1 (see Table 1 for the average number, k , raters per judgment). The rating procedure consisted of seven blocks; in each block, children rated the same six faces presented in a different random order. The instructional story ended with the old captain retiring to a beautiful island and leaving his leadership position vacant. The animation consisted of drawings showing only the captain's back (thus, they did not provide any facial information that might have otherwise affected the children's subsequent ratings). The children were then asked in the first block to "... recommend men to the old captain. The old captain will choose one of them as the new captain. Would you recommend this man?" by rating each face on a 5-point scale ranging from 1 (*Certainly not!*) to 5 (*Yes, sure!*) with the anchors accompanied by cartoon faces displaying negative (frowning) and positive (smiling) faces, respectively. Although this task always occupied the first block, blocks two through six were randomly ordered and consisted of ratings aligned with the animated leadership story: *Does he always choose a good passage for the boat?*, *Is he good at explaining to the crew what to do?*, *Is he good at calming the crew down when they are afraid on dangerous trips?*, *Does he look like a captain?*, and *Does he look good?* (a measure of attractiveness), all using the same 5-point scale as in the first block. Finally, the children indicated whether they had recognized any of the faces and, if so, rated every face with regard to whether it was familiar to them in a final block; we removed data from recognized faces prior to analysis (2.5% of all trials). As in Study 1, we removed strings of identical ratings for a complete block and excluded in toto data from children who provided strings of identical ratings in more than half of the blocks (10.3% of all trials).

Estimation strategy

We related these judgments to the CSEs, occupational status, and

leadership role data for the targets while accounting for the Professional Coach dummy variable, as in Study 1. To guard against endogeneity bias, we followed the same IV-estimation procedures described in Study 1, except that we did not have to account for nesting by photoset because the photos were chosen randomly in Study 2.

Results

We found an acceptable degree of interrater agreement (all ICC2s $> .70$; see Table 1) and, thus, averaged each target's ratings across all of the children. As in Study 1, we excluded the attractiveness (here, *looks good*) rating from our analyses because it strongly correlated with the leadership ratings due to common source and method effects (all r s $> .49$, all p s $< .001$) (Antonakis et al., 2010; Podsakoff et al., 2012). The other five ratings concerned perceptions of leadership (*preselection as captain*, *looks like a captain*, *chooses a good passage*, *explains what to do*, *calms sailors down*); thus, we examined the appropriateness of combining them into one Leadership score by performing a principal components analysis with varimax rotation (e.g., Rule & Ambady, 2008). Indeed, the analysis returned a one-factor solution in both the neutral-photo and impression-management conditions, so we averaged the individual ratings into a single Leadership composite (see Table 5). We also calculated ICC scores for the Leadership composite after averaging the five ratings within each rater; the resulting ICC2 scores revealed acceptable values for both photo types (see Table 1). Because the ratings of the targets correlated strongly across the impression-management and neutral photos (all r s $> .59$, all p s $< .001$), we averaged them into a single index for our main analyses, as above (see Table 6 for the means, standard deviations, and correlations for all variables).

The associations between Leadership and the targets' leadership roles ($B = 0.81$, $SE = 0.36$, $p = .02$; Table 4, Model 3a) and occupational status ($B = 1.54$, $SE = 0.75$, $p = .04$; Model 5a) were positive and significant, reinforcing our support for Hypothesis 1. The association between Leadership and leadership role remained significant when controlling for Professional Coach status ($B = 0.78$, $SE = 0.36$, $p = .03$; Model 3b) but the relation with occupational status became marginally significant ($B = 1.43$, $SE = 0.73$, $p = .051$; Model 5b). Leadership also positively associated with CSEs ($B = 0.34$, $SE = 0.11$, $p = .001$; Model 1a), regardless of whether Professional Coach status was included ($B = 0.34$, $SE = 0.11$, $p = .002$; Model 1b), consistent with Hypothesis 2.

Instrumental-variable mediation analyses

CSEs significantly predicted leadership role ($B = 2.99$, $SE = 1.23$, $p = .02$) and occupational status ($B = 5.82$, $SE = 2.37$, $p = .01$), regardless of Professional Coach status (leadership role: $B = 2.92$, $SE = 1.24$, $p = .02$; occupational status: $B = 5.50$, $SE = 2.35$, $p = .02$; see Table 4, Models 4a, 6a, 4b, and 6b, respectively). Based on these results, we conducted several mediation analyses using a bias-corrected bootstrapping procedure with 10,000 bootstraps to derive the CIs for the indirect effect.

Supporting Hypothesis 3, we found that CSEs again mediated the positive association between Leadership and both success criteria (leadership role: indirect effect = 0.91, $SE = 0.31$, 95% CI [0.30, 1.49]; occupational status: indirect effect = 1.76, $SE = 0.65$, 95% CI [0.48, 3.16]; see Table 4, Models 2a, 4a, 2a, and 6a, respectively), regardless of whether we accounted for Professional Coach status (all indirect effects ≥ 0.87 , all SE s ≤ 0.63 , all 95% CIs [0.24, 3.01]). Moreover, the correlations between the disturbances of CSEs with leadership role ($\Psi = -0.39$, $SE = 0.21$, $p = .059$) and occupational status ($\Psi = -0.65$, $SE = 0.40$, $p = .102$) approached significance, indicating that the CSEs may be endogenous. We therefore conducted a stronger test for endogeneity and compared the likelihood ratio of the instrumental variable model to one in which we constrained the disturbances of CSE-leadership role and CSEs-occupational status to zero (Antonakis

⁶ One child did not complete this measure.

Table 6
Means, standard deviations, and correlations of all variables in Study 2.

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Leadership	3.03	0.33					
2. Age	46.00	7.81	.02				
3. Professional Coach status	0.08	0.27	.06	.06			
4. Core self-evaluations	3.83	0.42	.27**	.12	.11		
5. Occupational status	7.17	2.88	.18*	.18*	.24**	.30**	
6. Leadership role	2.65	1.39	.19*	.18*	.16	.22*	.49**

Note. *N* = 130 targets.

* $p \leq .05$.

** $p \leq .01$.

et al., 2010). The likelihood ratio test was significant, $\chi^2(2) = 6.40$, $p = .04$ (regardless of whether Professional Coach status was included, $\chi^2(2) = 6.02$, $p = .049$), again supporting the endogeneity of the CSEs and the need for IV-estimation to obtain consistent estimates (Antonakis et al., 2010). Overidentification tests indicated that the mediation models fit the data well [$\chi^2(2) = 1.17$, $p = .56$; with Professional Coach dummy: $\chi^2(2) = 1.12$; $p = .57$]. In addition, none of the modification indices exceeded the minimum value, suggesting that our models fit the data well.

Exploratory analyses with adults' trait inferences

Similar to Study 1, the children's Leadership judgments strongly related to the adults' trait inferences of Warmth [$r(128) = .67$, $p < .001$] and moderately to their judgments of Power [$r(128) = .45$, $p < .001$].

Discussion

The results of Study 2 showed again that men who looked more like leaders had achieved higher positions of leadership and greater occupational status. More important, the men's self-reported CSEs mediated this association. Further, children's perceptions of leadership strongly related to adults' inferences of Warmth, and moderately related to adults' inferences of Power. The similar pattern of results across children and adults in Studies 1 and 2 suggests that both groups use similar heuristics when perceiving leadership from faces, supporting the possibility that such judgments may rely on basic processes that operate without work experience or workplace socialization. In addition, the findings suggest that inferences based on scant facial information can predict important real-world phenomena like increased occupational status, leadership role attainment, and CSEs. Indeed, the association between CSEs and success documented in previous work (e.g., Judge et al., 2003; Judge, Hurst, & Simon, 2009) supports the possibility that perceptions of leadership from the face might reflect the targets' actual leadership ability.

General discussion

Here, we found that perceptions of leadership based on the face correlated with men's success at work. Both children's and adults' judgments of leadership from men's faces significantly corresponded to the leadership roles that they occupied in their jobs and to their occupational status. Critically, the targets' CSEs mediated these associations. Their apparent leadership ability therefore related to their internal traits (i.e., CSEs), which in turn correlated with their success in leadership roles within their professional organizations. This suggests that superficial perceptions of leadership may index abilities that reliably and meaningfully predict legitimate leadership behaviors. Moreover, our observation that judgments made by both children and adults lead to similar conclusions suggests that the processes by which leadership is expressed and perceived might have very basic roots that do not require workplace socialization.

Adults' and children's perceptions of leadership revealed small-to-medium positive associations with occupational status and leadership role. These findings align with the results of previous research showing that first impressions of faces predict leadership outcomes in business, politics, law, and the military (e.g., Mueller & Mazur, 1996; Rule & Ambady, 2008, 2011; Todorov et al., 2005).

The results of both Studies 1 and 2 underscored the importance of perceptions of leadership from the face for men's self-concepts. Evolutionary models of mating posit that status and resources promote competitive advantages among men, and evolutionary models of self-concept have shown that status-related traits are integral for men (e.g., Buss, 1989; Campbell & Wilbur, 2009; Li et al., 2002). Consistent with these ideas, having a face that signals status and resources (as through conveying impressions of leadership, for example) may encourage positive self-concepts in men.

Moreover, the associations between perceptions of leadership, CSEs, and success appeared to be quite robust. We also found remarkable consistency between perceptions made by both the children in Study 2 and the adults in Study 1. In line with findings showing that adults' and children's perceptions of faces follow similar processes with relatively equivalent outcomes (Antonakis & Dalgas, 2009; Cogsdill et al., 2014), the association between success and facial appearance seems to generalize for both children and adult observers. This consistency points to the possibility that people may perceive leadership quickly and without relevant experience due to evolved adaptive mechanisms by which the face functions as a diagnostic tool (Antonakis & Dalgas, 2009; Ballew & Todorov, 2007; Spisak, Dekker, et al., 2012; Spisak, Homan, et al., 2012). Specifically, the similar responses of adults and children suggest that workplace experiences may not be necessary to learn leadership prototypes. Rather, leadership prototypes could stem from more basic processes potentially honed over the course of human evolution (e.g., Rule et al., 2011; Spisak, Homan, et al., 2012), via an innate face template (Reid et al., 2017), or from early rapid learning (Slater & Quinn, 2001). For instance, human groups that could quickly select effective leaders might have enjoyed survival advantages compared to groups that could not (Van Vugt et al., 2008). Honestly advertising leadership ability through one's face might have thus facilitated leader emergence and enabled group coordination. We offer these speculations tentatively, because they involve processes that would be difficult to test directly, requiring substantial future work before permitting strong conclusions. Moreover, self-fulfilling prophecies could explain why appearance, CSEs, and success relate, given that individuals who look like leaders may be treated like leaders and the provided leadership experiences allow them to develop leadership ability, further reinforcing the initial impression (Antonakis & Eubanks, 2017; Rule & Ambady, 2011; Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015). Thus, an individual might not possess leadership ability at the outset but cultivate it as a byproduct of fitting an apparent leader prototype.

Likewise, Judge, Piccolo, and Kosalka (2009) theorized that individual differences may promote the diverse skills needed for leadership, thereby enhancing the survival of a group. Although the advantages of being a leader (e.g., to have more resources, such as opportunities for procreation) and having high CSEs may seem obvious, one might question why anyone would choose to be a follower? First, followers may realize that their traits do not favor their ascension into a leadership position; thus, they increase their chances of survival by following others (Judge, Piccolo, & Kosalka, 2009). Second, leaders often must delegate tasks to followers (e.g., to supplement their own expertise), which can include similar rewards. Following, then, does not purely mean subjugation; rather, it can meaningfully facilitate an individual's survival and prosperity by cooperating with others who have different skills.

Strengths and limitations

Despite many important studies documenting the association

between first impressions of leadership and various real-life outcomes, this is the first empirical investigation of how these associations may manifest within the workplace. Moreover, most of the prior research on this topic has examined individual elite leaders across organizations (see Re & Rule, 2017; Rule & Tskhay, 2014). In contrast, the present work investigated how perceptions of leadership within the rank-and-file members of an organization also predict their success. Thus, both the targets and participants were real employed adults, rather than undergraduates lacking work experience, and we observed parallel results when sampling children. This allows us to generalize the findings beyond a specific company or profession, demonstrating high ecological and external validity. Moreover, using multiple criteria (occupational status and leadership role occupancy) and conducting a multi-sample study of raters further increases the generalizability of our findings. In addition, we found convergent results across multiple standardized stimuli of targets (i.e., photos with a neutral facial expression and an impression-management facial expression), allowing us to control for different gestures and postures in pictures. This not only speaks well to the internal validity of our research, but also helps to efficiently demonstrate the face's role in these judgments (rather than its ephemeral social presentation; see Rule, Krendl, Ivcevic, & Ambady, 2013; Todorov & Porter, 2014).

This research also has several limitations, however. For instance, our cross-sectional design challenges our capacity to draw causal inferences, even though the proposed theory supports our model (Antonakis, 2011; Judge, Hurst, & Simon, 2009; Spisak, Dekker, et al., 2012). Moreover, longitudinal studies found that CSEs predicted individuals' work success and growth trajectories (Judge & Hurst, 2008; Judge, Hurst, & Simon, 2009). Thus, the hypothesized mediation seems sensible, despite the cross-sectional design, because we can assume that the variables we studied exist in a sort of stable equilibrium: facial appearance predicts CSEs, which predict success at work (Fischer, Dietz, & Antonakis, 2017).

That said, both facial appearance and CSEs may be somewhat plastic. Although many regard CSEs as stable, they show malleability just as other traits do (e.g., neuroticism, self-esteem; Nübold et al., 2013; Orth, Trzesniewski, & Robins, 2010; Roberts, Walton, & Viechtbauer, 2006; Wu & Griffin, 2012). Similarly, experiencing success at work could positively influence one's CSEs and traits like CSEs could influence appearance (e.g., Dorian Gray effects; see Zebrowitz, 1997). Although previous research showing that facial cues predict leadership outcomes decades later casts doubt on the latter (Mueller & Mazur, 1996; Rule & Ambady, 2011; see also Zebrowitz, Olson, & Hoffman, 1993), we recognize that CSEs and success may influence each other bidirectionally (see also Roberts, Caspi, & Moffitt, 2003). Thus, we conducted mediation analyses using an instrumental variable estimator to guard against endogeneity bias and a limited-information maximum likelihood estimator, which is partially robust to weak instruments (e.g., age in our studies) and therefore more reliable in these circumstances than a two-step least squares estimator (e.g., Staiger & Stock, 1997; Stock, Wright, & Yogo, 2002).

Yet, the variables we investigated (facial appearance, CSEs, and success) might still all arise from omitted variables or a common cause that we did not measure (e.g., general fitness; Antonakis & Eubanks, 2017). For instance, indicators of general fitness such as facial symmetry, intelligence, and extraversion all correlate (Antonakis & Eubanks, 2017). In addition, omitted variables such as intelligence and motivation both relate to CSEs and success, therefore potentially accounting for the associations we found (e.g., intelligence and motivation can antecede and succeed CSEs, respectively; Ferris et al., 2011; Judge, Hurst, & Simon, 2009). Moreover, we cannot exclude the possibility that children's and adults' converging leadership perceptions both result from early socialization, particularly as the children were already roughly 10 years old (similar to the ages of participants in Antonakis & Dalgas's, 2009, research). Experiences with one's family, school, or media (e.g., TV, movies) might foster leadership prototypes

in children, though previous research found that the predictions of political leaders' electoral success did not depend on age (regardless of whether a 5-year-old child or a 70-year-old adult made the judgment; Antonakis & Dalgas, 2009). Because children as young as five years do not have much experience with workplace leadership, our concordant results for children and adults appear even more remarkable, and align with research showing that preschool children reliably attributed trustworthiness and competence to faces (Cogsdill et al., 2014).

In addition, although we excluded all ratings of participants who indicated that they recognized a target face, the handball player participants in Study 1 might have given unconsciously biased judgments resulting from mere exposure to the target faces (though replication of those results with the child sample in Study 2 discourages this possibility).

Finally, because the CSES measures CSEs generally, we could not investigate whether these processes might have varied across its four subcomponents (i.e., emotional stability, self-esteem, generalized self-efficacy, and locus of control). Measuring CSEs directly, rather than as a multidimensional construct, can be problematic (Chang et al., 2012; Johnson, Rosen, & Levy, 2008). For instance, multiple CSE components could differentially affect work outcomes, as they may have different antecedents (Johnson et al., 2008). Future research may therefore benefit from examining the relation between appearance and these specific components. Modeling them in future research would also help to determine the robustness of our results.

Directions for future research

Certainly, future studies could extend the present findings in a number of ways. For instance, because of the low frequency of female coaches in A-level workshops of the German Handball Association, we only investigated male targets. This leaves open the question of how gender might influence the internal traits that account for the association between perceptions of leadership and leadership outcomes observed in other work (e.g., Chiao, Bowman, & Gill, 2008; Rule & Ambady, 2009). Indeed, previous studies might suggest that the association between perceptions of leadership, CSEs, and professional success may be deeper and more complex for female leaders (e.g., Hogue & Lord, 2007; Joshi, Son, & Roh, 2015; Silberzahn & Menges, in press).

Similarly, given past research showing that leadership perceptions can vary based on cultural values (e.g., Rule et al., 2010; see also Abdalla & Al-Homoud, 2001; House, Javidan, Hanges, & Dorfman, 2002), extending these tests to targets and participants from diverse cultural backgrounds might help to advance the present findings as well. Consistent findings across such diverse samples might especially help to address the currently speculative possibility that evolutionary processes might partially explain the phenomena we observed.

Future studies might also use a longitudinal design to investigate whether leadership- or status-related impressions might positively influence the development of one's self-concept. These might not only include CSEs, but also other self-concept aspects, such as one's self-perception as a leader and identification with leadership roles.

Finally, although we found that perceptions of leadership related to targets' internal CSEs and demonstrated leadership success, one's appearance does not always convey elements of truth (see Jussim, Crawford, & Rubinstein, 2015, for review). Rather, facial appearance might unproductively bias leader selection and future research could help to discern when facial appearance facilitates or misleads individuals in their decisions to follow a particular leader.

Practical implications

These findings may have practical implications for organizational assessment systems presently used to make decisions about employment and promotion. Decision makers generally seek to minimize the influence of job-irrelevant human capital (Baruch & Bozionelos, 2011).

Yet, ample evidence shows that employers favor people with particular appearances no matter how much job-relevant information they have available to them (Hosoda et al., 2003; Rule, Bjornsdottir, Tskhay, & Ambady, 2016). Thus, decision makers should ensure that organizational assessment systems emphasize the knowledge, skills, and abilities needed for a position. Moreover, interviewers should focus on the relevant behavior of a candidate, which helps to protect against erroneously hiring (or dismissing) someone because he or she simply “looks right” for a particular position.

Conclusion

The present research underscores the importance of facial appearance for career success and leadership role occupancy. Adults' and children's judgments of faces correlated with targets' occupational status and leadership role at their place of work. CSEs mediated this association, suggesting that having a face that conveys status may contribute to a positive self-concept in men. Consistency between the perceptions of adults and children suggests that the mechanism underlying these relations do not rely on socialization within an organizational framework. Thus, what shows on the “outside” of a person may, in some instances, match a bit of what he or she holds on the “inside,” potentially forecasting the efficacy of that individual as a leader.

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Appendix A. The Core Self Evaluations Scale (CSES)

Below are several statements about you with which you may agree or disagree. Please indicate for every item the amount of agreement, which describes yourself best.

1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree.

1. I am confident I get the success I deserve in life.
 2. Sometimes I feel depressed. (r)
 3. When I try, I generally succeed.
 4. Sometimes when I fail I feel worthless. (r)
 5. I complete tasks successfully.
 6. Sometimes, I do not feel in control of my work. (r)
 7. Overall, I am satisfied with myself.
 8. I am filled with doubts about my competence. (r)
 9. I determine what will happen in my life.
 10. I do not feel in control of my success in my career. (r)
 11. I am capable of coping with most of my problems.
 12. There are times when things look pretty bleak and hopeless to me. (r)
- r = reverse-scored.

Appendix B

The individuals serving as targets completed the following additional measures: self-monitoring (18 items; Snyder, 1974), political skill inventory (18 items; Ferris et al., 2005), positive and negative affect schedule (20 items; Watson, Clark, & Tellegen, 1988), and subscales from the work values inventory (18 items; Super, 1973). They also answered demographic questions about their parents' country of origin, height, weight, education, full- versus part-time work, name of occupation, job tenure in years, hours of work per week, number of employees supervised, and prior leadership roles (i.e., which type, how

long, and number of employees supervised). They furthermore responded to relevant questions related to handball: the name and league of their sport club, average age class and sex of their team, number of players on their team, their team's standing in the last season, their number of hours of training per week, and their total hours busy with handball per week. Target coaches also answered questions about their coaching tenure (overall and in their current club) and highest coaching league (and for how long). Target players answered whether they had been a coach before (and, if so, for which team in what league). Finally, the target individuals indicated whether they enacted a leadership role in their spare time in another domain (e.g., another sports club, religious organization, music ensemble, garden plot, political party, etc.) and, if so, the type of position, hours per week spent in that activity, and the number of persons they supervised.

Appendix C. Supplementary materials

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.leaqua.2018.01.002>.

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