Decomposing the Relationship Between Candidates' Facial Appearance and Electoral Success

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Abstract:

Numerous studies show that candidates' facial competence predicts electoral success. However, a handful of other studies suggest that candidates' attractiveness is a stronger predictor of electoral success than facial competence. Furthermore, the overall relationship between inferences from candidates' faces and electoral success is challenged in two ways: (i) non-facial factors in candidate photos such as clothing and hair style as well as (ii) parties' nomination strategies are suggested as potential confounds. This study is based on original data about all 268 candidates running in three local elections in 2009 in Denmark and supports a two-component structure of the relationship between candidates' facial appearance and their electoral success. Facial competence is found to mediate a positive relationship between candidates' attractiveness and electoral success, but simultaneously facial competence also predicts electoral success over and above what can be accounted for by attractiveness. Importantly these relationships are found when seven different non-facial factors, parties' nomination strategies and candidates' age and gender are controlled for. This suggests that the two-component structure of the relationship between candidates' facial appearance and electoral success is highly robust.

Introduction

The quality of public opinion has long attracted considerable attention from political scientists. One key insight from this literature is how citizens make use of mental shortcuts, such as party affiliation or likability of a candidate, to form opinions and decide whom to vote for on election day (e.g., Campbell, Converse, Miller, & Stokes, 1980; Lupia, McCubbins, & Popkin, 2000). However, recent work shows that factors such as the performance of local football teams, shark attacks, and polling locations affect citizens' opinions and decision-making, which potentially raises new concerns about the quality of citizens' political attitudes (Achen & Bartels, 2004; Healy, Malhotra, & Mo, 2010; Rutchick, 2010). Another such seemingly irrelevant factor in democratic elections is candidates' facial appearance, which is found to have pronounced effects for voters' decision making (e.g., Olivola & Todorov, 2010).

The predictive power of candidate faces has been demonstrated in both laboratory settings and across various real-world election contexts (for review articles see Hall, Goren, Chaiken, & Todorov, 2009; Olivola, & Todorov, 2010). Despite widespread support for the relationship between candidates' facial appearance and their electoral success, disagreement exists regarding which specific facial traits are most strongly related to candidates' electoral success. One group of results show that facial competence predicts electoral success when attractiveness is controlled for (e.g. Olivola, & Todorov, 2010), other results show that attractiveness is the stronger predictor or even theorize that attractiveness drives the predictive power of facial competence (e.g. Berggren Jordahl, & Poutvaara, 2010; Verhulst, Lodge, & Lavine, 2010).

Based on these diverging results regarding facial competence and attractiveness, I hypothesize a two-component framework in which facial competence plays a double role: (1) It serves as mediator for a positive relationship between attractiveness and electoral success; and (2) it distinctly and unrelated to the mediator-role predicts a significant part of the variance in electoral success. Analyses of original data from Danish local elections in 2009 support the hypothesized

two-component structure. Furthermore, this result holds when recent challenges to the overall relationship between candidates' facial appearance and electoral success are taken into account by controlling for seven different non-facial factors of candidate photos, parties' nomination strategies, and candidates' gender and age

Theory

When asked to pick the most competent-looking person from photos of two unknown political candidates, respondents tend to pick the winning candidate significantly more often than chance would suggest (Todorov, Mandisodza, Goren, & Hall, 2005). Similar results are found across different countries, political cultures and institutional settings (for review articles see Hall, Goren, Chaiken, & Todorov, 2009; Olivola & Todorov, 2010). That is, candidates' facial appearance seems to be a robust predictor of electoral success. However, the psychological and theoretical foundation of this series of findings has been debated.

Facial competence and/or attractiveness

The literature on political candidates' facial appearance has extensively demonstrated that inferences of competence from candidates' faces predict election results (Hall, Goren, Chaiken, & Todorov, 2009; Olivola & Todorov, 2010). Moreover, this finding holds when subjects' competence inferences from candidate faces are based on only 100 ms exposure to candidate photos, suggesting that the results reflect spontaneous and automatic psychological processes (see Olivola & Todorov, 2010). Political scientists have demonstrated that competence is one of the most important traits for evaluation of politicians (Miller, Wattenberg, & Malanchuck, 1986; Todorov, Mandisodza, Goren, & Hall, 2005). This is also reflected in the literature on face-based trait inferences with competence inference being a stronger predictor of election results than inferences of other traits (Hall, Goren, Chaiken, & Todorov, 2009). Olivola & Todorov (2010)

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further identify three features that potentially drive these competence inferences: attractiveness, facial maturity, and masculinity.

For this study attractiveness is of major importance since another set of results show that attractiveness (or beauty) predicts electoral success (see for example Berggren, Jordahl, & Poutvaara, 2010; Hart, Ottati, & Krumdick, 2011; King & Leigh, 2009; Rosar, Klein, & Beckers, 2008). This is largely in line with findings across other social science disciplines that physical attractiveness relates positively to earnings and generally has positive effects throughout the life-course (see for example Hamermesh & Biddle, 1994; Jæger, 2011). Going one step further, Verhulst, Lodge, & Lavine (2010) even argue that assessments of attractiveness are more fundamental than inferences of competence, and using the 'attractiveness halo effect' as theoretical point of departure they reexamine existing data and show that attractiveness (and familiarity) could operate indirectly through perceptions of candidate competence on vote outcomes (Verhulst, Lodge, & Lavine, 2010, p.112-115). In other words, if attractiveness assessments are more fundamental than competence assessments attractiveness might play a larger role than facial competence, and even relationships that at first glance seem to be facial competence centered could in fact be driven by candidates' attractiveness.

In sum, there is strong evidence that trait inferences from candidates' faces predict electoral success, but it is unclear whether facial competence or attractiveness is the stronger predictor even when both variables are included in the analyses. This is not because existing research fails to include both facial competence and attractiveness when predicting electoral success, but because the analyses yield different results (see Olivola & Todorov (2010) for relationship between facial competence and electoral success when attractiveness is controlled for, and Berggren, Jordahl, & Poutvaara (2010) for relationship between attractiveness and electoral success when facial competence is controlled for). Furthermore, Verhulst, Lodge, & Lavine (2010)

suggest that even significant predictions of electoral success by facial competence are a product of candidates' attractiveness being mediated by facial competence.

This study's main contribution is to hypothesize and test the simultaneous existence of (1) a positive relationship between attractiveness and electoral success mediated by facial competence, and (2) a distinct relationship between facial competence and electoral success over and above what can be accounted for by candidates' attractiveness. Following the trend in the existing literature, both attractiveness and facial competence are included as predictors of electoral success, but in order to test the simultaneous presence of the two-component structure a two-step analytic framework is introduced. This framework first conducts standard tests of the mediated relationship between attractiveness and electoral success, and afterwards it seeks to cancel out any explanatory power of attractiveness on facial competence and electoral success to produce evidence that facial competence simultaneously predicts electoral success.

Methods and data gathering

Investigating the relationship between candidates' facial appearance and electoral success requires a research design that links perceptions of real political candidates' faces with their actual numbers of votes. Data of this kind was therefore gathered from the 2009 Danish local elections in three municipalities[1]. Danish local elections are proportional representative elections where usually eight or nine parties can nominate as many candidates as there are seats in the city council (in this case maximum 31 nominated candidates). Voters can then vote for either the party or for a specific candidate from a party. Ahead of the election, local party associations nominate their candidates and assign each candidate a position on the ballot corresponding with the party associations' preferences. After the election, seats are first distributed to parties according to their total number of

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[1] Brønderslev, Frederikshavn and Mariagerfjord municipalities, located in the northern part of Denmark.

votes, and then distributed within the parties in accordance with the candidates' number of personal votes.

Facial Traits

Photos of all 268 nominated candidates (70 female) in the three Danish local elections in 2009 were compiled from an online database provided by a regional news medium. Parties and candidates sent in the photos, and the news medium later standardized (200 X 250 pixels) the size of the photos[2]. To obtain valid ratings of the candidates' facial traits, 646 subjects aged 16–20 years were recruited from Danish high schools[3]. After answering a handful of background questions, each subject was shown one candidate photo at a time and asked to rate the candidate's attractiveness and facial competence based only on the photo. Each subject rated eight or nine candidates[4]. This procedure departs slightly from other studies of physical appearance across disciplines where a relatively low number of subjects rate all candidates' appearance (for a brief overview regarding this topic see King & Leigh, 2009: pp. 582-583). However, it follows procedures applied in other multi-party and multi-candidate electoral contexts (e.g. Rosar, Klein, & Beckers, 2008; Berggren Jordahl, & Poutvaara, 2010). Moreover, Berggren Jordahl, & Poutvaara (2010) find that results do not vary

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[2] Approval for using the pictures was given by Nordjyske Medier. The total number of candidates in each municipality is: Brønderslev (89 candidates), Frederikshavn (87) and Mariagerfjord (92).

[3] The respondents do not constitute a representative sample of the Danish voters. However, prior research gives no reason to expect that using young respondents should create biased face-based trait inferences (Antonakis & Dalgas, 2009). Still, one might expect young respondents to find younger candidates more attractive, which is also the case here (young candidates are on average rated as significantly more attractive than middle-aged candidates ($p = 0.003$); and middle-aged candidates are on average rated as more attractive than old candidates ($p < 0.001$) (see "Non-facial Elements, Ballot Position, Candidates' Gender and Age" below for information on age categories). To minimize any bias stemming from this, the perceived age of the candidates is controlled for in all models.

[4] Besides attractiveness and competence, respondents rated the following traits from the candidate photos: intelligence, responsibility, dominance, friendliness, and physical strength. From this list, intelligence and responsibility are of particular interest, since they correlate strongly with competence ($r = 0.880$ and $r = 0.840$, respectively). Attractiveness is only measured using one item. In order to place attractiveness and competence on an equal basis, the single competence item will be used in the analyses. However, the same substantial results are reached using a scale consisting of competence, intelligence, and responsibility.

between ratings based on a small number of subjects rating all candidate photos and ratings based on a large number of subjects rating a small subset of the candidate photos (Berggren, Jordahl, & Poutvaara, 2010: p. 14). This suggests that having different subjects rate different photos (as in the present study) should not bias the findings.

To secure the measures of candidates' facial competence and attractiveness against idiosyncrasies of certain subjects, the candidate photos were randomly grouped into 34 packages (following Rosar, Klein, & Beckers, 2008) and subjects were randomly assigned to one candidate photo package. The average respondent-to-candidate ratio was 19, which equals the ratios applied in similar studies (Banducci, Karp, Thrasher, & Rallings, 2008; Rosar, Klein, & Beckers, 2008). Each trait was rated on 0–10 scales, with 0 indicating "not at all attractive" and 10 indicating "very attractive" (a corresponding scale was used for ratings of facial competence). The exact verbal expression is shown in Figure 1 and follows earlier studies asking subjects to base their ratings on first impressions since this is found to yield better predictions of electoral success than asking subjects to deliberate and make good judgments (e.g., Berggren, Jordahl, & Poutvaara, 2010; Todorov, Mandisodza, Goren, & Hall, 2005; Olivola & Todorov, 2010).

'Figure 1 about here'

Finally, following the "truth-of-consensus method" (see Rosar, Klein, & Beckers, 2008: p.70) the average facial competence scores and attractiveness scores for each candidate were calculated from the subjects' individual ratings. These scores were divided by 10 to create 0–1 scales, where 0 indicates low attractiveness (or low facial competence) and 1 indicates high attractiveness (or high facial competence). All candidate ratings were obtained from March 31 to May 11 2011.

One obvious problem with this design is to eliminate any familiarity bias—that is, to make sure that subjects' ratings of facial traits are based solely on candidates' faces and not on prior

knowledge about the candidates. Previous studies have either eliminated famous or nationally well-known candidates (e.g., King & Leigh, 2009; Rosar, Klein, & Beckers, 2008), ratings of recognized candidates (e.g., Hall, Goren, Chaiken, & Todorov, 2009: p.77) or tried to control for the potential bias (Berggren, Jordahl, & Poutvaara, 2010). To deal with the familiarity bias in this study, respondents were recruited from high schools located far from the candidates' municipalities and none of the subjects indicated recognition of candidates[5].

Electoral Success

The number of votes for both parties and candidates are gathered from the official website of the Danish election authority[6]. These numbers are used to calculate candidates' electoral success—Relative Success—as defined in two studies of candidates' facial appearance in proportional representation election systems (Berggren, Jordahl, & Poutvaara, 2010: p.11; Poutvaara, Jordahl, & Berggren, 2009). Relative Success is calculated as (p_i/v_j), where p_i is the number of votes cast for candidate i; v_j is the total number of personal votes cast for party j divided by party j's number of candidates. The measure compares the number of personal votes for a given candidate, p_i, to the hypothetical number of votes the candidate would have received if personal votes within the party were equally distributed, v_j. However, a few top candidates receive disproportionately large numbers of personal votes making Relative Success highly skewed to the right, for which reason the logarithm of Relative Success is calculated[7]. Finally this measure is recoded to a 0-1 scale with 0

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[5] Subjects were recruited from Rosborg Gymnasium, Campus Vejle and Risskov Gymnasium.

[6] Number of votes for each candidate is available online: http://www.kmdvalg.dk/kv/2009/adk.htm.

[7] Logging constitutes the standard procedure for solving skewness problems. Here, skewness is reduced from 3.89 to 0.24 (zero indicates no skewness). Furthermore, the distribution of error terms approximates the normal distribution better using the logged measure of electoral success; likewise, other assumptions for using OLS regression are better fulfilled using Electoral Success (the logged measure).

reflecting minimal (observed) Electoral Success and 1 reflecting maximum (observed) Electoral Success[8].

Non-facial Elements, Ballot Position, Candidates' Gender and Age

Below the different control variables are presented with their corresponding categories in parentheses. The italicized category indicates the reference group for the categorical variable in the regression analyses. Following standard procedures in the field, candidates' gender (female, *male*) and age (younger than 30; *between 30 and 60*; older than 60)[9] are controlled for.

However, the general relationship between candidates' facial appearance and their electoral success has recently been challenged in two fundamental ways, which calls for extended control procedures. First, Spezio and his fellow researchers show that competence evaluations from candidate silhouettes (facial traits are blurred but the contour of the face is kept) can also forecast election results (Spezio, Loesch, Gosselin, Mattes, & Alvarez, 2012). Thus, Spezio et al. recognize the role played by candidates' visual appearance, but suggest that this is potentially driven by non-facial features in faces. They stress the role of the facial contour and elements such as background, hairstyle, and clothing[10]. This study therefore includes seven different non-facial features varying across candidate photos: clothing (formal, *informal*), hairstyle (short hair, long hair, *bald*), hair color (blond, brown, black, red, grey, *unknown due to picture color in black/white*), beard (stubble,

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[8] More specifically, the logarithmic values of Relative Success, log(Relative Success), are recoded to a 0-1 scale by subtracting the smallest observed value of log(Relative Success) from every other value and finally these values are divided by the range of log(Relative Success).

[9] Age is operationalized as observers' perception of candidates' age and afterwards trichotomized following Berggren, Jordahl, & Poutvaara (2010), who find that the same substantial relationship between candidates' facial traits and their electoral success is reached using candidates' real age and using observers' perceptions of candidates' age (Berggren, Jordahl, & Poutvaara, 2010: p.14).

[10] It should be recognized that some previous work already includes control variables such as photo background, candidates' ethnicity, gender etc. by for example only including candidate pairs who do not vary on these variables (e.g., Todorov, Mandisodza, Goren, & Hall, 2005). While this study is not the first to control for non-facial factors, it significantly extends the non-facial factors that are controlled for.

mustache, *shaved*), glasses (wearing, *not wearing*), photo background (multi-colored, nature, *one-colored*), and candidates' perceived emotional state (happy, sad or grumpy, *neutral*)[11].

Second, Atkinson, Enos, & Hill (2009) suggest that the predictive power of facial competence could suffer from omitted variable bias since "part of the relationship between candidate face and election outcomes is the selection of candidate faces to competitive districts" (Atkinson, Enos, & Hill, 2009, p. 243). In other words, any relationship between facial competence and electoral success could be due to parties' nomination strategies. Other studies offer indirect evidence against Atkinson, Enos, & Hill's idea – that facial appearance indicates candidate quality – since voters with low political knowledge but high TV exposure are found to rely most on candidates' facial appearance and republican voters are shown to prefer the most republican-looking candidate even when that candidate actually is a democrat (Lenz & Lawson, 2011; Olivola et al., 2012). In this study I utilize the within party nomination system of local Danish elections to control for parties' nomination strategies. Since members of Danish city councils must reside within the relevant municipality, parties do not strategically move candidates between municipalities in accordance with their "candidate quality" (cf. Atkinson, Enos, & Hill, 2009). Instead, parties' strategic behavior translates into the order in which candidates appear on the ballot, with the parties' preferred candidates on top of the ballot, their second-most preferred candidates as number two, and so on. Studies have investigated and found some evidence for ballot order effects (e.g., Ho & Imai,

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[11] All variables (except for gender) were coded by non-respondent observers. The coding process proceeded in two steps: (i) in accordance with descriptions in a codebook, two or four observers coded all candidate photos with regard to certain variables. (ii) inter-coder reliability was calculated using Krippendorff's α (Krippendorff, 2004: pp. 221–243). α-values for glasses and background indicate total agreement among observers (i.e. α = 1), while α varies between 0.70 (hair color) and 0.93 (beard) for the rest of the control variables. Specific disagreements were discussed among the observers who, after agreement, clarified potential ambiguities in the codebook to avoid similar misunderstandings for the subsequent codings. The final codebook is available from the author upon request.

2008; Meredith & Salant, 2013; Miller & Krosnick, 1998), and ballot position is therefore used as proxy for parties' nomination strategies[12].

Combined, the different control variables constitute the second contribution of the study, which deals extensively with existing challenges to the overall relationship between candidates' facial appearance and electoral success.

Results

The most basic implication of the two-component framework is to establish that both facial competence and attractiveness predict electoral success. Regressing Electoral Success on facial competence shows that this is indeed the case (b = 0.329, p = 0.001 (all p-values reported for two-tailed tests)). This relationship also holds after control for seven non-facial factors, candidates' ballot position, gender, and age (b = 0.230, p = 0.007). The relationship between attractiveness and Electoral Success also turns out to be statistically significant, but not as strong as for facial competence (b = 0.198, p = 0.022), and it further decreases when the control variables are included (b = 0.135, p = 0.096). Table 1 shows models predicting Electoral Success from facial competence or attractiveness as well as the control variables.

'Table 1 about here'

First of all, these results strongly support that inferences from candidate faces predict Electoral Success even when non-facial factors in the candidate photos and candidates' ballot positions, age and gender are controlled for. In other words, non-facial factors and parties' potential strategic nominations cannot account for the predictive power of facial competence and

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[12] Data on candidates' ballot positions: http://www.kmdvalg.dk/kv/2009/adk.htm

attractiveness, respectively, on Electoral Success[13]. In relation to the hypothesized two-component structure, the results in Table 1 only offer weak indicative support. Actual support requires confirmation of two individual tests: (1) a significant relationship between attractiveness and Electoral Success through facial competence (the 'attractiveness halo'); and (2) a distinct relationship between facial competence and Electoral Success should be significant even when attractiveness is given predictive priority at the expense of facial competence.

'Attractiveness halo'

In Table 1 attractiveness was found to be a positive predictor of Electoral Success. For facial competence to mediate the relationship between attractiveness and Electoral Success, attractiveness must also predict facial competence. This is strongly supported even after control for non-facial factors, candidates' age and gender ($b = 0.630$, $p < 0.001$) (see Appendix 1, Model C, for the full model). Furthermore for facial competence to serve as mediator of the relationship between attractiveness and Electoral Success, the predictive power of attractiveness on Electoral Success should decrease when competence and attractiveness simultaneously are used as predictor variables. This is also supported since attractiveness now does not relate significantly to Electoral Success ($b = -0.017$; $p = 0.876$), while facial competence is still a positive predictor ($b = 0.241$; $p = 0.032$) (see Appendix 1, Model D, for the full model)[14]. Together with the previous results regarding the individual predictive power of facial competence and attractiveness, respectively, these results are summed up in Figure 2:

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[13] Following Atkinson, Enos, & Hill's (2009) reasoning, one might expect Danish parties to nominate candidates with high facial competence to the ballot's top positions. However, predicting ballot position from facial competence ($b = -7.867$; $p = 0.196$) and attractiveness ($b = 3.607$; $p = 0.534$) as well as the same control variables as in Table 1 yields insignificant results.

[14] Substantially, the same conclusion is reached when I do not include the control variables: Attractiveness predicts facial competence ($b = 0.450$, $p < 0.001$) and attractiveness does not predict Electoral Success when facial competence is introduced ($b = 0.068$; $p = 0.493$) while facial competence does ($b = 0.290$; $p = 0.010$).

'Figure 2 about here'

Figure 2 illustrates that the extent to which facial competence predicts Electoral Success does not decrease when attractiveness is controlled for, whereas attractiveness is only a significant predictor of Electoral Success as long as facial competence is not included.

A final test of the 'attractiveness halo' is conducted using Structural Equation Modeling to specify a path model from attractiveness through competence on Electoral Success. Also controlling for non-facial factors, candidates' ballot position,[15] age and gender, reveals a strong and positive indirect relationship between attractiveness and Electoral Success through facial competence ($b = 0.152$, $p = 0.026$)[16]. Altogether, these results support the 'attractiveness halo' and therefore also the proposed two-component structure for the relationship between candidates' facial appearance and Electoral Success.

Distinct predictive power of facial competence

In the above analyses facial competence was already found to be a significant predictor of Electoral Success when attractiveness and the control variables were taken into account. However, for the two-component structure to be supported a test that shows facial competence to predict Electoral Success over and above what can be accounted for by attractiveness is needed. The left-hand side of Figure 2 shows that the predictive power of facial competence is almost twice the predictive power of attractiveness when controlling for non-facial factors, ballot position, gender and age. The significance of this difference is exactly what needs to be tested, which is done in two ways.

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[15] Ballot position was only included as predictor of Electoral Success since facial competence and attractiveness must be expected to influence ballot position and not vice versa.

[16] The SEM-analysis consists of models similar to Model C and Model D in Appendix 1. Furthermore, the indirect path is also significant without control for other variables ($b = 0.130$, $p = 0.012$).

First, it is investigated if facial competence significantly increases the explanatory power when added to a model predicting Electoral Success from attractiveness, non-facial factors, ballot position, gender and age. Regardless of facial competence serving as mediator for attractiveness, a rise in R^2 indicates that facial competence also *independently* relates to candidates' Electoral Success. Regressing Electoral Success on attractiveness, non-facial factors, age and gender yields an R^2 value of 0.425 ($R^2_{adjusted} = 0.373$), but when facial competence is included R^2 increases to 0.435 ($R^2_{adjusted} = 0.382$) representing a significant increase in the amount of explained variance ($F (1, 245) = 4.56$, $p = 0.032$)[17]. In other words, facial competence explains significantly more of the variance in Electoral Success than what is captured by attractiveness alone.

Second, Olivola & Todorov's two-step procedure (2010: pp.95-96) constitutes an even harder test of the distinct predictive power of facial competence on Electoral Success. Residuals of facial competence (after predicting facial competence from attractiveness, non-facial factors, age and gender) are used to predict Electoral Success, which still yields a significant relationship ($b = 0.347$, $p = 0.014$; see Figure 3b). Finally, even residuals of Electoral Success (after predicting Electoral Success from attractiveness, non-facial factors, candidates' ballot positions, age and gender) are significantly predicted by the facial competence residuals ($b = 0.239$, $p = 0.026$; see Figure 3c). Figure 3 illustrates the very robust positive relationship between facial competence and Electoral Success as tested with the different residual analyses described above.

'Figure 3 about here'

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[17] The same substantial result is reached when non-facial factors, ballot position gender and age are excluded. R-squared doubles from 0.020 to 0.044 (with adjusted R-square rising from 0.016 to 0.036) constituting a significant increase ($F(1, 265) = 6.68$, $p = 0.010$).

In sum, this shows that facial competence also independently predicts Electoral Success besides serving as mediator for the relationship between attractiveness and Electoral Success. The above analyses therefore support the proposed two-component structure of the relationship between candidates' facial appearance and their electoral success.

Conclusion

Two important conclusions stand out from the analyses. First, the results support the hypothesized two-component structure and for the first time highlight that there are two different components in the relationship between candidates' facial appearance and electoral success: The first component is attractiveness driven, i.e., more attractive candidates are perceived as more competent and therefore receive more votes. The second component is distinctly related to facial competence and shows that facial competence besides serving as mediator also predicts electoral success over and above what can be accounted for by attractiveness. However, it is worth clarifying the added knowledge from this study more specifically. Both the 'attractiveness halo' and the significant relationship between facial competence and electoral success controlled for attractiveness have been shown before (cf. Olivola & Todorov, 2010; Hall, Goren, Chaiken, & Todorov, 2009; Verhulst, Lodge, & Lavine, 2010). This study extends our knowledge by showing *the simultaneous existence of the two different components in the relationship between facial appearance and electoral success*.

The second major contribution is the apparent robustness of the relationship between candidate facial appearance and electoral success. Complying with two major challenges in the literature, the results are supported when seven different non-facial features in the photos (cf. Spezio, Loesch, Gosselin, Mattes, & Alvarez, 2012), parties' nomination strategies expressed through candidates' ballot positions (cf. Atkinson, Enos, & Hill, 2009) as well as candidates' age and gender are simultaneously controlled for. This constitutes one of the most thorough tests

applied in the literature and speaks very strongly in favor of a reliable and robust relationship between candidates' facial traits and electoral success.

Although these findings extend our knowledge about the role of trait inferences from candidate faces, unanswered questions remain. Most importantly, the theoretical foundation of the relationship between facial competence and electoral success is unclear. For instance, showing that even facial competence residuals can predict electoral success (see Figure 3b and 3c) might cancel out potential explanations such as clothing and hair style but it does not provide actual explanations for the relationship between facial competence residuals and electoral success. Future research investigating the theoretical foundation of the relationship between facial competence and electoral success is therefore needed.

Acknowledgements

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Figure 1 Question wording for ratings of candidates' facial competence and attractiveness

Before rating a given candidates' facial competence and attractiveness, respectively, respondents read the following text (translation from Danish to English):

Take a look at the photo to the left. Please rate the person in the photo based on your first impressions. You must rate the person on all seven traits stated below. Choose the number between 0 and 10 that best suits your impressions of the person. 0 indicates that the person is minimally attractive (or competent). 10 indicates that the person is maximally attractive (or competent).

To which extent do you perceive the person as…

Figure 2 Predictive power of candidates' facial traits on Electoral Success.
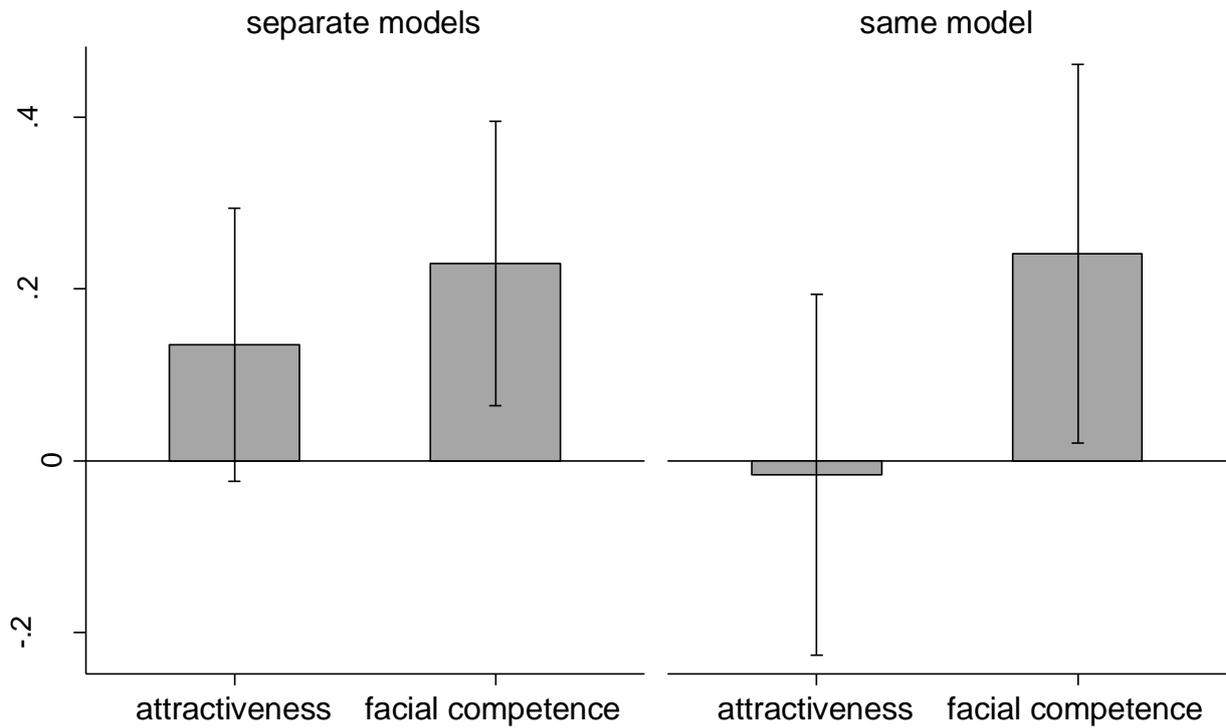
Note: Bars are regression coefficients from OLS regressions predicting Electoral Success from facial competence and attractiveness and controlling for non-facial elements, ballot position, and the candidates' gender and age. Error bars are 95% confidence intervals for the regression coefficients. Bars on the left-hand side of the figure (separate models) are from models that only include attractiveness *or* facial competence besides the mentioned controls. Bars on the right-hand side of the figure (same model) are from a model that includes attractiveness and facial competence simultaneously.

Figure 3 Scatter plots of Electoral Success predicted by facial competence

a)

b)

c)
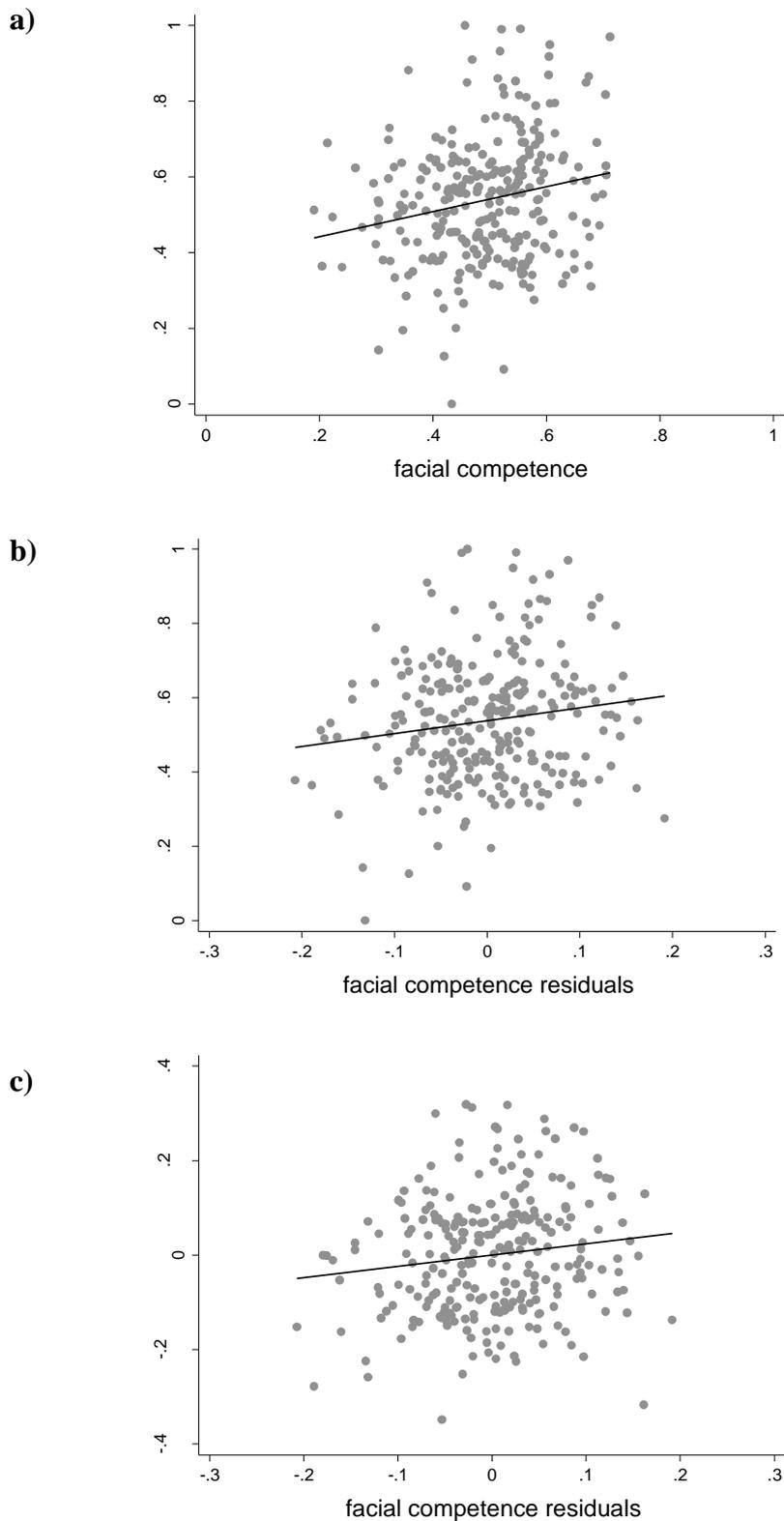
Note: Figures show: a) Electoral Success predicted by facial competence; b) Electoral Success predicted by residuals of facial competence (controlling for attractiveness, clothing, hairstyle, hair color, beard, glasses, photo background, emotional expression, age and gender); c) Electoral Success residuals (controlling for attractiveness, clothing, hairstyle, hair color, beard, glasses, photo background, emotional expression, age, gender and ballot position) predicted by facial competence residuals (as in b)). Each point represents a specific candidate. The black lines represent best linear fit.

Table 1 Predictions of candidates' Electoral Success from either facial competence or attractiveness.

Models are based on OLS regressions, coefficients are unstandardized, and standard errors appear in parentheses.

	Model A: Predicting Electoral Success from facial competence	**Model B:** Predicting Electoral Success from attractiveness
Facial competence	0.230^{**} (0.084)	-
Attractiveness	-	$0.135^{\dagger}$ (0.81)
Gender		
- Female	0.022 (0.032)	0.012 (0.033)
Age		
- young (< 30)	0.002 (0.037)	–0.022 (0.037)
- old (> 60)	–0.015 (0.023)	–0.007 (0.024)
Clothing		
- formal clothing	$0.038^{\dagger}$ (0.021)	0.048^{*} (0.020)
Glasses		
- Wearing glasses	$–0.029^{\dagger}$ (0.017)	–0.023 (0.018)
Hairstyle		
- short hair	–0.053 (0.037)	–0.054 (0.037)
- long hair	–0.069 (0.049)	–0.072 (0.049)
Hair color		
- blond	0.115^{**} (0.040)	0.116^{**} (0.041)
- brown	0.090^{*} (0.035)	0.0091^{*} (0.035)
- black	0.111^{**} (0.036)	0.112^{**} (0.037)
- red	-0.038 (0.057)	-0.033 (0.058)
- grey	0.085^{*} (0.035)	0.085^{*} (0.036)
Beard		
- stubble	0.036 (0.042)	0.028 (0.043)
- mustache	0.037 (0.032)	0.043 (0.032)
- full beard	–0.023 (0.023)	–0.018 (0.023)
Facial expression		
- smiling	0.015 (0.020)	0.013 (0.020)
- sad or grumpy	–0.067 (0.079)	–0.082 (0.079)
Background		
- multicolored	–0.019 (0.025)	–0.019 (0.025)
- nature	$–0.058^{*}$ (0.024)	$–0.056^{*}$ (0.024)
Ballot position	$–0.013^{***}$ (0.001)	$–0.014^{***}$ (0.001)
Constant	0.528^{***} (0.050)	0.613^{***} (0.035)
N	268	268
R^2	0.433	0.422
Adjusted R^2	0.384	0.373

Note: Facial competence and attractiveness are measured on 0–1 scales (1 = highest possible value); ballot position corresponds to the position of the candidate on the ballot in her/his district. Reference categories for categorical variables: male (Gender); informal clothing (Clothing); not wearing glasses (Glasses); bald (Hairstyle); unknown – due to picture color (Hair color); shaved (Beard); neutral (facial expression); one-colored (background).
$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. All p-values reported for two-tailed tests.

Appendix 1 Full models for the reported regression coefficients in the text

Models A and B predicts Electoral Success from facial competence and attractiveness, respectively. Model C predicts facial competence from attractiveness. Finally, Model D predicts Electoral Success from both facial competence and attractiveness. All models furthermore control for non-facial factors, ballot position, gender and age. OLS regressions; unstandardized coefficients with standard errors in parentheses.

	Model A: Predicting Electoral Success from facial competence	Model B: Predicting Electoral Success from attractiveness	Model C: Predicting facial competence from attractiveness	Model D: Predicting Electoral Success from facial competence and attractiveness
Competence	0.230^{**} (0.084)	-	-	0.241^{*} (0.112)
Attractiveness	-	$0.135^{\dagger}$ (0.81)	0.630^{***} (0.046)	-0.017 (0.107)
Gender				
- female	0.022 (0.032)	0.012 (0.033)	-0.048^{*} (0.019)	0.024 (0.034)
Age				
- young (< 30)	0.002 (0.037)	-0.022 (0.037)	-0.107^{***} (0.021)	0.004 (0.039)
- old (> 60)	-0.015 (0.023)	-0.007 (0.024)	0.033^{*} (0.013)	-0.015 (0.024)
Clothing				
- formal clothing	$0.038^{\dagger}$ (0.021)	0.048^{*} (0.020)	0.044^{***} (0.012)	$0.038^{\dagger}$ (0.021)
Glasses				
- Wearing glasses	$-0.029^{\dagger}$ (0.017)	-0.023 (0.018)	0.028^{**} (0.010)	$-0.030^{\dagger}$ (0.018)
Hairstyle				
- short hair	-0.053 (0.037)	-0.054 (0.037)	-0.007 (0.021)	-0.052 (0.037)
- semi-long and long hair	-0.069 (0.049)	-0.072 (0.049)	-0.014 (0.028)	-0.69 (0.049)
Hair color				
- blond	0.115^{**} (0.040)	0.116^{**} (0.041)	0.002 (0.023)	0.114^{**} (0.041)
- brown	0.090^{*} (0.035)	0.0091^{*} (0.035)	-0.001 (0.019)	0.090^{*} (0.035)
- black	0.111^{**} (0.036)	0.112^{**} (0.037)	-0.001 (0.021)	0.111^{**} (0.037)
- red	-0.038 (0.057)	-0.033 (0.058)	0.021 (0.033)	-0.039 (0.058)
- grey	0.085^{*} (0.035)	0.085^{*} (0.036)	-0.002 (0.020)	0.084^{*} (0.036)
Beard				
- stubble	0.036 (0.042)	0.028 (0.043)	-0.036 (0.024)	0.037 (0.043)
- mustache	0.037 (0.032)	0.043 (0.032)	0.026 (0.018)	0.037 (0.032)
- full beard	-0.023 (0.023)	-0.018 (0.023)	0.019 (0013)	-0.023 (0.023)
Facial expression				
- smiling	0.015 (0.020)	0.013 (0.020)	-0.012 (0.011)	0.016 (0.020)
- sad or grumpy	-0.067 (0.079)	-0.082 (0.079)	-0.061 (0.045)	-0.067 (0.079)
Background				
- multicolored	-0.019 (0.025)	-0.019 (0.025)	0.005 (0.014)	-0.019 (0.025)
- nature	-0.058^{*} (0.024)	-0.056^{*} (0.024)	0.012 (0.019)	-0.058^{*} (0.024)
Ballot position	-0.013^{***} (0.001)	-0.014^{***} (0.001)		-0.013^{***} (0.001)
Constant	0.528^{***} (0.050)	0.613^{***} (0.035)	0.362^{***} (0.019)	0.525^{***} (0.054)
N	268	268	268	268
R^2	0.433	0.422	0.520	0.433
Adjusted R^2	0.384	0.373	0.481	0.382

Note: Attractiveness and competence are coded 0–1, 1 being the highest possible value; ballot position corresponds to the position of the candidate on the ballot in her/his district. Baseline categories for categorical variables: male (Gender); informal clothing (Clothing); not wearing glasses (Glasses); bald (Hairstyle); unknown – due to picture color (Hair color); shaved (Beard); neutral (facial expression); one-colored (Background).
$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. All p-values reported for two-tailed tests.