Management Science

A Corporate Beauty Contest

John R. Graham, Campbell R. Harvey, Manju Puri

Please scroll down for article—it is on subsequent pages

∙informs.

A Corporate Beauty Contest

John R. Graham,[a, b] Campbell R. Harvey,[a, b] Manju Puri[a, b]

[a] Fuqua School of Business, Duke University, Durham, North Carolina 27708; [b] National Bureau of Economic Research, Cambridge, Massachusetts 02912
Contact: john.graham@duke.edu (JRG); cam.harvey@duke.edu (CRH); mpuri@duke.edu (MP)

Abstract. We provide new evidence that the subjective "look of competence" rather than beauty is important for CEO selection and compensation. Our experiments, studying the facial traits of CEOs using nearly 2,000 subjects, link facial characteristics to both CEO compensation and performance. In one experiment, we use pairs of photographs and find that subjects rate CEO faces as appearing more "competent" than non-CEO faces. Another experiment matches CEOs from large firms against CEOs from smaller firms and finds large-firm CEOs look more competent. In a third experiment, subjects numerically score the facial traits of CEOs. We find competent looks are priced into CEO compensation, more so than attractiveness. Our evidence suggests this premium has a behavioral origin. First, we find no evidence that the premium is associated with superior performance. Second, we separately analyze inside and outside CEO hires and find that the competence compensation premium is driven by outside hires—the situation where first impressions are likely to be more important.

1. Introduction

A provocative economic theme suggests there is a "beauty premium" in which attractive workers earn more than workers with below average looks (see, e.g., Hamermesh and Biddle 1994).[1] These results suggest that perception based on facial attributes is important. However, there is relatively little economics research examining the broader impact of facial traits beyond beauty, though there is a large psychology literature that examines facial traits more generally. As an intriguing example of the latter, Todorov et al. (2005) find that winners in congressional elections can be predicted by appearance. In their experiment, participants are exposed for as little as one second to the faces of a pair of politicians with whom they are not familiar. Surprisingly, the inference drawn in the blink of an eye about which politician looks more competent accurately predicts the winner in 71.6% of U.S. Senate elections in their sample.

The question of whether and how looks matter, and in particular whether facial traits are relevant, is especially important in the corporate context. The decision about the appointment of a CEO is often a heavily contested process. This situation differs from that of politicians insofar as not only is there a long track record available on chief executive candidates and the eventual winner but also the decision as to who is appointed CEO is usually made by a handful of professionals

(board of directors) who have a duty to carefully evaluate the alternative CEO candidates and whose compensation is in part linked to the success of the firm. In such situations, where there is ample information about past performance and the decision is made by a small group of informed people, should looks still matter? And are looks priced into compensation packages? If so, is there a rational basis for this?

We address these questions using three Internet-based experiments in which about 2,000 participants evaluated facial attributes of the CEOs of companies relative to the facial attributes of a control sample of the same gender, race, and similar age. The first experiment involves pairwise comparisons of CEOs to the control sample. We ask respondents to assess the facial attributes of the CEO to a matched non-CEO counterpart on four dimensions: beauty, competence, trustworthiness, and likability. We next compare CEOs of large firms to CEOs of small firms on the same four facial traits.

Our results indicate that the primary facial trait that consistently distinguishes between CEOs and the control groups is "competence." We find that individuals who appear more competent are more likely to be CEOs. Similarly, we show that more competent-looking CEOs are significantly more likely to lead large companies.

Importantly, we go beyond the literature on thin slicing (first impressions) in a number of ways. To begin

with, we provide the first tests of whether facial traits are "priced." In particular, we relate facial assessments of competence, beauty, trustworthiness, and likability to compensation using data from Standard and Poor's (S&P) Execucomp database. We find that CEOs who are judged to be more competent looking tend to earn higher wages but no other facial trait is significantly correlated with compensation. Once we control for size of the company, both beauty and competence are priced but the competent-look premium is larger than the beauty premium.

Second, we are able to test two explanations for the competent-look premium. From a neoclassical perspective, faces may be an observable indicator of performance characteristics; hence, facial traits may rationally earn a return in the labor market. In contrast, facial appearance irrationally affects only the perception of performance characteristics in a behavioral explanation.

Our evidence is inconsistent with the neoclassical explanation. First, our analysis, which controls for firm characteristics, does not find any evidence of superior performance associated with the firms of competent-looking CEOs. Second, we separate external CEO hires (recruited from outside the firm) and internal CEO hires (promoted from within the firm). First impressions are much less likely to be important for internal hires. For both inside and outside hires, the board of directors has a duty to carefully evaluate the alternative candidates. Indeed, the directors' own compensation is linked to the quality of their choice. Importantly, the directors have much more information, including private information, about the inside hires. For example, the internal CEO's work history provides the input for an assessment of competence. Our results show that there is no competent-look premium for internally promoted CEOs. The overall premium is driven by outside hires. Therefore, our results are consistent with the behavioral explanation of the competent-look premium.

Next, we explore what leads to assessments of competence based on facial attributes. The branch of the psychology literature that examines the ecological basis for evaluation of facial attributes suggests that onlookers tend to assign characteristics of infants to adults with a "baby-faced" appearance. Thus, baby-faced individuals are generally perceived to possess childlike traits, including a perception of naïveté, honesty, kindness, and warmth (see, e.g., Berry and McArthur 1985). Zebrowitz and Montepare (2005) suggest that differences in perception of competence also stems from visual differences in "baby-facedness." Accordingly, we assess whether CEOs differ in terms of baby-facedness relative to a control group and whether this is correlated with the perception of competence. We find this is indeed the case. CEOs are generally viewed as being more mature-faced (as opposed to baby-faced) than are non-CEOs, and this visual maturity is positively correlated with the perception of competence and negatively related to the perception of likability.

Our results relate to the literature that suggests that appearance matters specifically in the corporate context. Rule and Ambady (2008) conduct a principal components analysis on two groupings of traits. They conclude that traits are important for performance. However, their analysis is problematic because they do not scale profits by firm size. That is, a large firm could have a large dollar profit and not be very profitable. Our paper correctly measures performance and does something that Rule and Ambady do not do—we are able to separate the "look of competence" from attractiveness.

A recent paper by Halford and Hsu (2014) uses an algorithmic measure of attractiveness. Our paper offers a subjective assessment of both attractiveness and competence based on a very large sample of subjects. The Halford and Hsu paper does not measure competence—which our results suggest is a dominant feature. Similarly, Gomulya et al. (2015) take an algorithmic approach and use the facial width to height ratio to proxy for trustworthiness of CEOs around earnings restatements.

Overall, our paper also adds to a growing branch of literature that goes beyond beauty to see if other personal traits (such as deepness of voice; see Mayew et al. 2013) matter.

The paper is structured as follows. Section 2 describes the method and experiments that we employ. Our analysis and results and presented in §3. Some concluding remarks are offered in the final section.

2. Experiments
2.1. CEO Matched Pair Experiments
In our first experiment, we perform a pairwise comparison of photographs of CEOs versus a control group of non-CEOs. We ask respondents to compare the facial traits of each CEO/non-CEO pair in terms of competence, attractiveness, trustworthiness, and likability. The specific steps in our experiments are described next.

2.1.1. Collecting Photographs of CEOs. We obtained an initial list of CEOs from S&P's Execucomp database for 2004. We then searched company websites for pictures of CEOs. Our goal was to collect photographs that had certain standard features: the resolution of the photograph, business dress, bland background, and a conventional pose. The photos were cropped so that the head sizes were approximately the same. We collected both color and black and white photographs. Because there were very few women CEOs and these CEOs would likely be identifiable to the subjects, we dropped women from our final analysis.

2.1.2. Creating a Matched CEO/Non-CEO. For this experiment, photographs of the sample of CEOs were matched to photographs of a control group belonging to other occupations. To form the control group, we sought photographs of non-CEOs in business attire and professional poses similar to the CEO photographs'. We specifically avoided sampling pictures of lawyers, doctors, and professors, preferring to focus on employees lower down on the corporate ladder. The photographs of the control group were matched to photographs from the CEO group using features such as similar hair (combed on side, bald, etc.), color of jacket, glasses, facial hair, and facial expression (e.g., both individuals in the matched pair are smiling). Matching on these traits may work against subjects being able to identify CEOs, but the matching focuses the experiment on underlying facial characteristics.

Ninety CEOs were chosen to match the control group pictures. In the end, we divided 86 pairs into roughly three groups of 30 or less.[2] Each respondent was asked to sequentially examine a deck of about 30 pairs and assess which person in each pair looked more competent, attractive, trustworthy, and likable, respectively. Figure 1 provides an example screen shot of this experiment as well as the initial screen that the subject sees.

2.1.3. Large-Company CEOs vs. Small-Company CEOs. For this experiment, we collected photographs of the CEOs from the 480 companies with the largest sales revenue in Execucomp (large-company CEOs) and CEOs from companies ranked from 481 to 1,753 (small-company CEOs). We paired each large-firm CEO with the CEO from a small firm based on visual criteria similar to the first experiment. Emphasis was placed on roughly matching the largest of the large-company group with the largest of the small-company group to ensure a substantial a difference in size between CEOs in each pair. Fifty-seven matched pairs were formed, which in turn were divided into two groups of almost 30 each. Respondents were asked to examine a deck of about 30 pairs and assess which person of each pair looked more competent, attractive, trustworthy, and likable, respectively. Figure 2 presents a screen shot of the second experiment.

2.1.4. Design and Delivery. We created five decks of paired experiments (three for the assessment of facial attributes of CEOs versus a control group and two for large-company CEOs versus small-company CEOs). The experiments were delivered on the Internet. Each respondent was randomly assigned one deck of 30 pairs. For each pair, the respondent assessed which person in the pair looked more competent, attractive, trustworthy, and likable. We did not limit the amount of time that a subject spent doing the experiment. We

also asked respondents to check a box if they recognized a subject. We drop these observations in our analysis.

Our respondents were generated by emails sent to both graduate and undergraduate students in business administration at Duke University and the University of North Carolina at Chapel Hill.[3] The email asked each recipient to forward our email to other business students at different institutions and to post our link on student-oriented social media. These experiments generated 1,527 subjects.

2.2. Numerical Experiments

In the third experiment, we asked subjects to rank each of the four attributes (beauty, competence, likability, and trustworthiness) on a scale of 1 to 5. The experiment was divided into two parts. In the first wave, each subject was given a deck of about 70 CEOs to score, with each deck being populated by randomly drawing from our database of 136 CEO pictures. This process allowed us to create ratings on a scale of 1 to 5 for 136 CEOs for each of the four attributes. We emailed the same group of graduate and undergraduate students and generated 230 subjects. The second wave simplified the rating task and reduced the chance of visual burnout. Since competence appears to be the most important attribute in our study and prior work suggests the importance of beauty, we recruited an additional 208 subjects to rank the CEO numerically only on two facial traits: competence and beauty. An example of the ratings screen for this third experiment (first wave) is presented in Figure 3.

One key aspect of our analysis is to link these ratings to both compensation and company performance. Of the 136 rated CEOs, we lack sales revenue for one company and were unable to obtain compensation for an additional CEO. Hence, we report results of this experiment for 134 CEOs.[4]

2.3. Baby-Faced Ratings

Our fourth experiment focuses on the branch of psychology that evaluates why appearance affects social perception and investigates whether an ecological approach to perception might help explain the link between facial features and specific personality impressions. A number of studies examine whether a baby-faced appearance causes people to assign infantile psychological attributes to a person. Berry and McArthur (1985) find that physical measurements of large, round eyes, high eyebrows, and a small chin yield the perception of a baby-faced appearance. Baby-facedness ratings are also positively correlated with perceptions of a person's naiveté, honesty, kindness, and warmth. The implication is that baby-faced people are perceived as more trustworthy and less competent. To test for this effect, we ask subjects to rate the baby-facedness of the CEOs and the control group. We then

Figure 1. CEOs vs. Non-CEOs
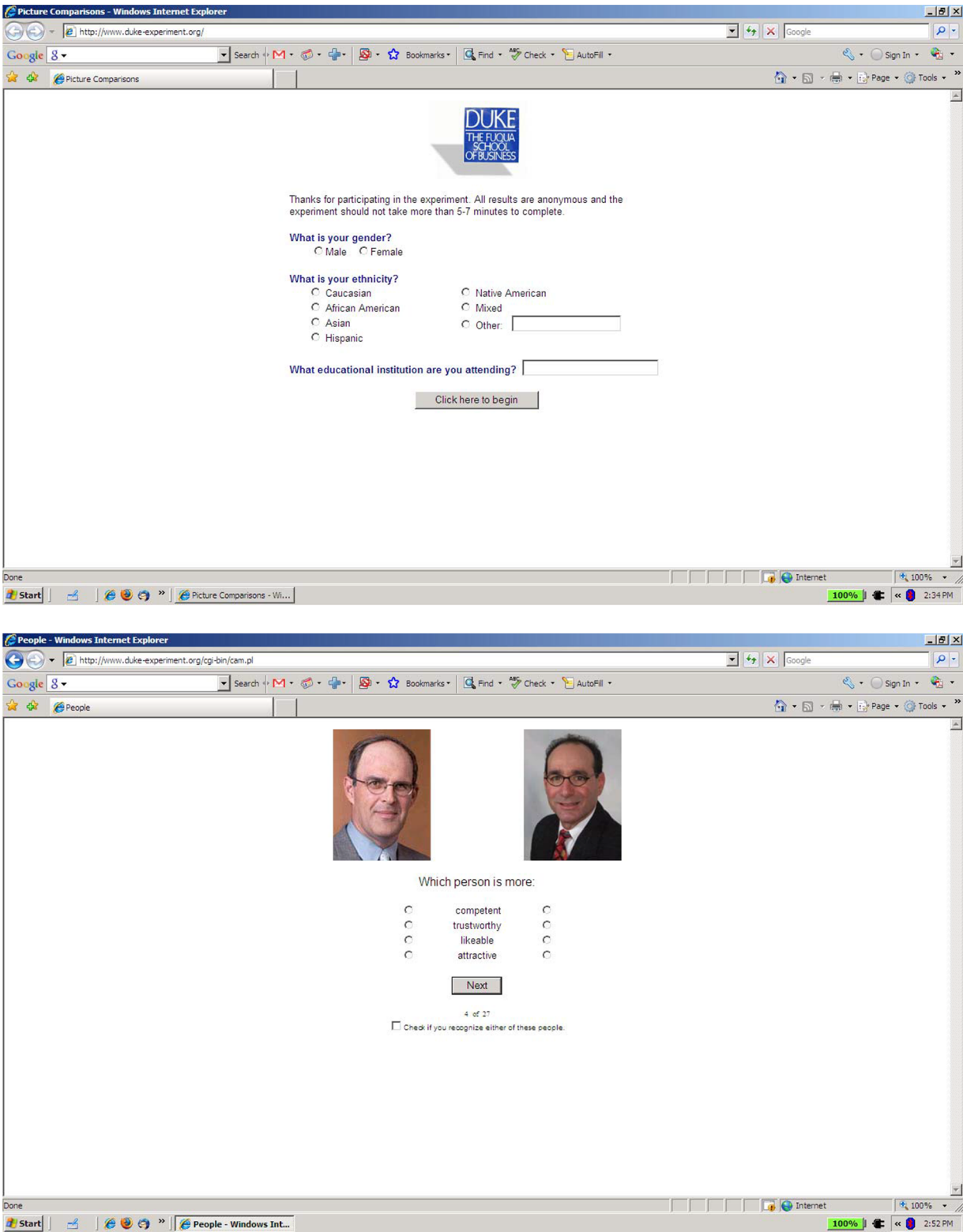
correlate the baby-faced characteristic to evaluations of competence-based facial characteristics.

Given that this is a more analytical task, we asked 10 Duke University Ph.D. students to score the faces of the CEOs in terms of whether they are baby-faced or mature on a scale of 1 to 5 and report this for our sample of 134 CEOs. This allows us to measure the correlation between baby-faced/maturity and the other traits.

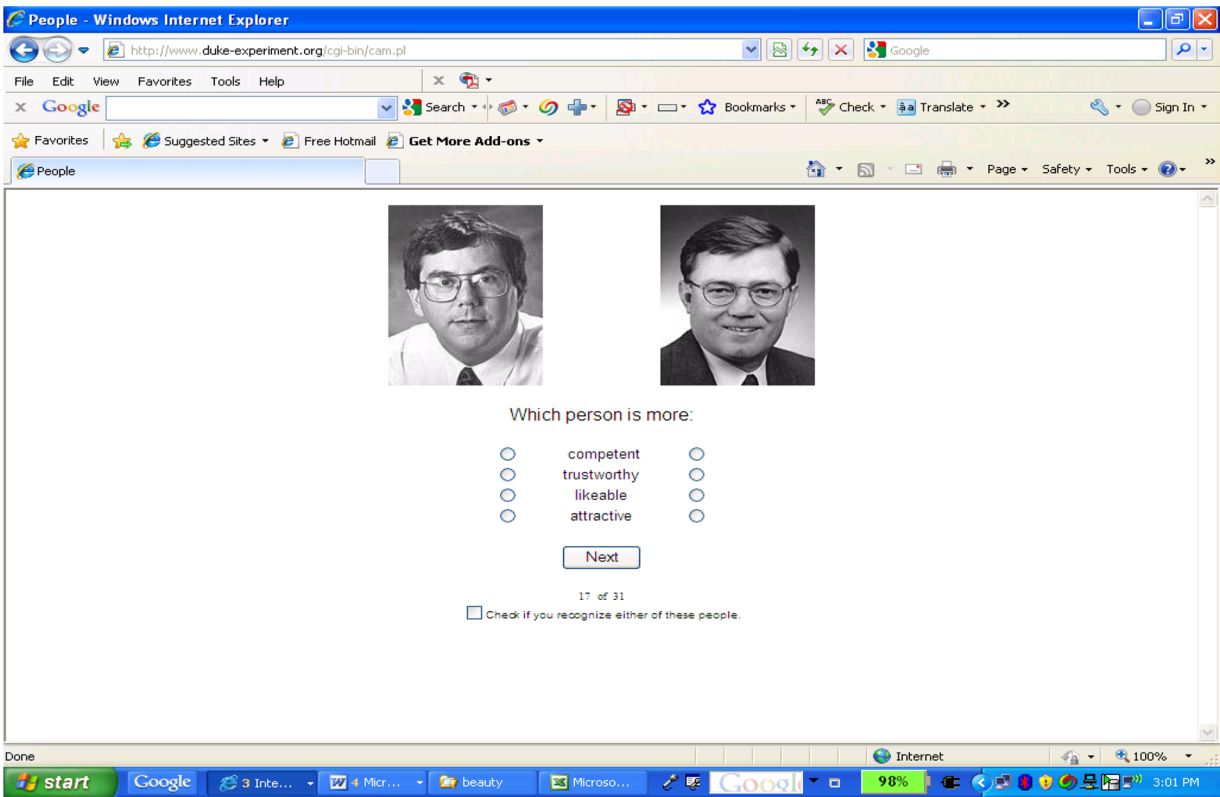**Figure 2.** Large-Company CEOs vs. Small-Company CEOs

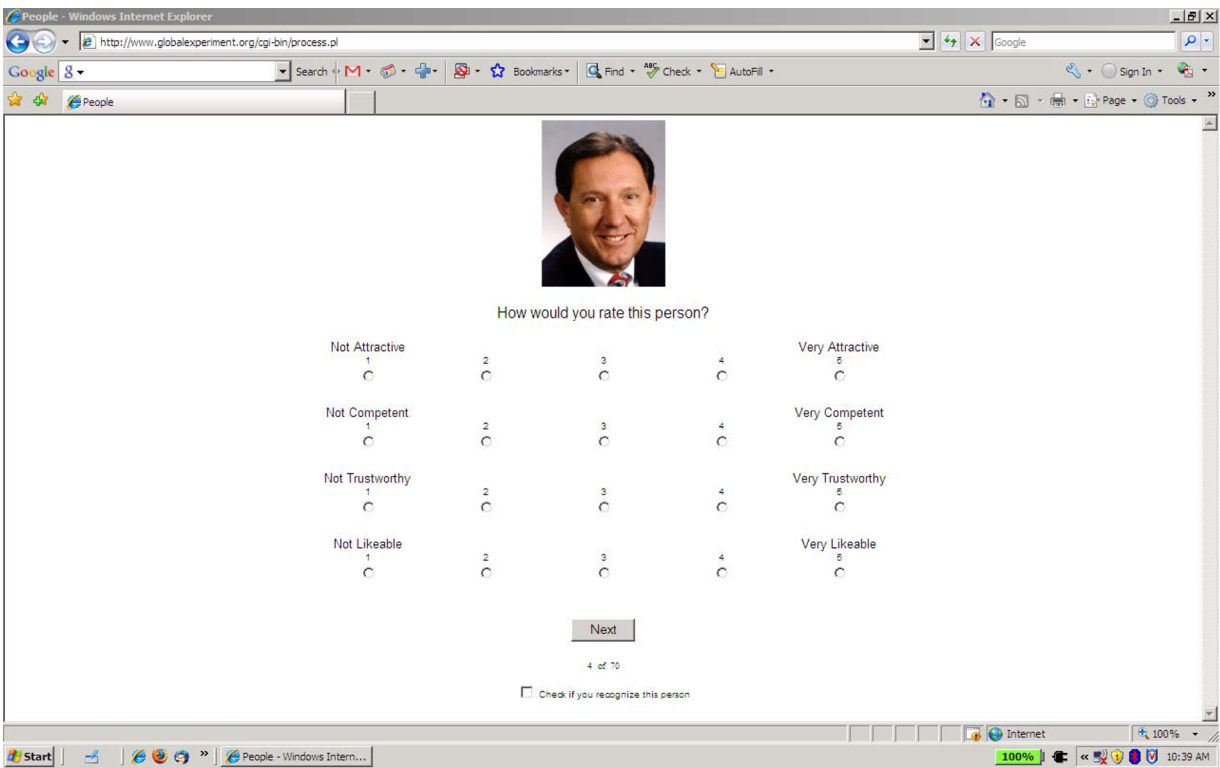**Figure 3.** Numerical Scoring of the Facial Traits of CEOs

Table 1 summarizes the experiments, population, task, design, the number of subjects, and experiment dates as well as providing a reference to the tables that contain the results for the different experiments.

3. Results

3.1. Identifying CEOs Based on Facial Traits

Panel A of Table 2 reports the percentage of time that the subject chooses the CEO (versus the control non-CEO photo) based on competence, trustworthiness, likability, and attractiveness. There are 86 CEO pairs and 708 subject responses. Significantly more of the subjects identified the CEO when asked to choose which person they felt was more "competent." We report both straight averages as well as observation weighted averages. The straight average calculates the percentage of the time the CEO was picked for each pair and reports the mean of these pair averages. Observation weighted averages represent the percentage of all respondent-pair observations for which the CEO was picked. Both measures indicate that the CEOs are deemed more competent looking.

We test whether the averages are significantly different from the null hypothesis of 50%. For each of the four traits, we find statistically significant differences. CEOs are viewed as more competent and more attractive. They are also viewed as less trustworthy and less likable. The sharpest difference is found in the perception of competence.

Panel B of Table 2 presents the same analysis for CEOs of large firms versus CEOs of small firms. There are 57 large–small firm CEO pairs and 699 subjects. Each of the four traits yields statistically significant results. For example, 53.8% of the respondents classify the large-firm CEO as more competent-looking than the small-firm CEO, and 43.6% of the subjects think that the large-firm CEO looks more likable than the small-firm CEO. Similarly, the large-firm CEOs are viewed as less trustworthy. The only major difference between the panel A experiment and the panel B experiment is related to attractiveness. From panel A, we know that CEOs are more attractive than our control group. In contrast, in panel B, small-firm CEOs are perceived to be more attractive than are large-firm CEOs.

An alternative explanation might be a reverse causality argument in that CEOs may pay for better photographs and so look better than others. However, this does not account for our result that CEOs look more competent but less trustworthy or likable. Nor would it explain why some facial traits are prized and others are not given that the compensation is set by the board who regularly see and meet the CEO.

What is the economic significance of our results compared to facial trait inferences in other settings? Todorov et al. (2005) find that candidates perceived as more competent won in 71.6% of Senate races and

Table 1. Summary of Experiments

Experiment	Population	Task	Design	Subjects	Tables
CEOs vs. non-CEOs	CEOs from 2004 Execucomp and pictures from company websites; non-CEOs from Internet	Choose which person in the pair of pictures is the most competent, attractive, likable, and trustworthy (four selections)	86 CEO pictures placed into three groups (decks) of roughly 30 CEO vs. non-CEO. Subject randomly assigned to one deck. Subjects asked not to rate people they recognize.	708 graduate and undergraduate business students	Table 2, panel A
Large- vs. small-company CEOs	CEOs from top 480 companies (large) in 2004 Execucomp matched against CEOs from rank 481–1,753 (small)	Choose which person in the pair of pictures is the most competent, attractive, likable, and trustworthy (four selections)	57 matched pairs of pictures assigned to two decks of roughly 30 pairs. Subject randomly assigned a deck. Subjects asked not to rate people they recognize.	669 graduate and undergraduate business students	Table 2, panel B
CEO ratings: Part A	CEOs from above population	Rate people on a scale of 1 to 5 based on competent, attractive, likable, and trustworthy (four separate ratings)	70 CEOs randomly drawn from database of 136 CEOs	230 graduate and undergraduate business students	Tables 3, 4, 5, 6, and 7
CEO ratings: Part B	CEOs from above population	Rate people on a scale of 1 to 5 based on competent and attractive (two separate ratings)	70 CEOs randomly drawn from database of 136 CEOs	208 graduate and undergraduate business students	Tables 3, 4, 5, 6, and 7
Baby-facedness	CEOs from above population	Rate people on a scale of 1(baby-faced) to 5 (mature)	Database of 134 CEOs	10 Ph.D. students	Table 8

Table 2. Pairwise Comparison of Facial Traits of CEOs and Non-CEOs

	Panel A: % correctly choosing the CEO			
	Competent	Attractive	Likable	Trustworthy
Observation weighted average (%)	53.78***	51.54***	49.48	47.83***
Z-statistic	8.69	3.55	−1.21	−4.98
Straight average (%)	54.11***	51.75***	48.98***	47.81
Z-statistic	9.28	3.94	−2.30	−4.95
Number of pairs	86	86	86	86
Number of respondents	708	708	708	708
	Panel B: % correctly choosing the large-firm CEO			
	Competent	Attractive	Likable	Trustworthy
Observations weighted average (%)	53.83***	45.77***	43.60***	48.64***
Z-statistic	8.78	−9.70	−14.74	−3.10
Straight average (%)	53.56***	45.94***	44.36***	48.86***
Z-statistic	8.03	−9.16	−12.73	−2.57
Number of pairs	57	57	57	57
Number of respondents	699	699	699	699

Notes. In panel A, CEOs are matched to non-CEO individuals to form 86 pairs for evaluation by subjects. In panel B, CEOs of large firms are matched to CEOs of small firms to form 57 large-firm/small-firm pairs. Panel A reports the percentage of subjects selecting the CEO as more competent, trustworthy, likable, or attractive. Panel B reports the percentage of subjects selecting the large-firm CEO. Observation weighted averages represent the percentage of all respondent-pair observations for which the CEO (large-firm CEO) was picked. The straight average calculates the percentage of the time the CEO (largefirm CEO) was picked for each pair and reports the mean of these pair averages. Z-statistics test the null hypothesis that the probability of picking the CEO (large-firm CEO) is 50% and are reported below point estimates.

   ***Denotes significance at the 1% level.

in 66.8% of House races. In our experiment, 53.8% of subjects identified the CEO as the person who was perceived as more competent. We find these relative magnitudes reasonable. The decision to appoint a CEO is not done by the layman (voter) on the street. Rather, CEO succession is a deliberative process engaged in by the board of directors, who should be familiar with the CEO candidates' strengths and weaknesses. Indeed, it is surprising that "competent looks" matter at all in such decisions, which are vetted over a number of months—often with the help of professional search consultants.

3.2. Scoring Facial Traits

Table 2 presents evidence consistent with the hypothesis that facial traits appear to be important in discriminating between CEOs and non-CEOs as well as large- and small-firm CEOs. However, this type of relative comparison cannot be used to link facial traits to compensation. To do this, we need to numerically score the facial traits.

Table 3 shows a correlation matrix of the numerical scores assigned to the four attributes for 134 CEOs. The analysis of competence and attractiveness is based on 230 and 438 subjects (230 reflecting the first wave

Table 3. Correlation Matrix for Facial Traits of CEOs

	CEO average ratings					
	Competent (230)	Competent (438)	Attractive (230)	Attractive (438)	Likable (230)	Trustworthy (230)
CEO average ratings						
Competent (230 subjects)	1					
Competent (438 subjects)	0.954***	1				
Attractive (230 subjects)	0.467***	0.490***	1			
Attractive (438 subjects)	0.473***	0.512***	0.986***	1		
Likable (230 subjects)	0.389***	0.380***	0.539***	0.506***	1	
Trustworthy (230 subjects)	0.602***	0.573***	0.318***	0.296***	0.750***	1
Number of CEOs	134	134	134	134	134	134

Notes. CEOs are rated on a scale of 1 to 5 with respect to whether they look competent, trustworthy, likable, and attractive. Attractive (230 subjects), competent (230 subjects), likable (230 subjects), and trustworthy (230 subjects) are based on 230 respondents in the numerical scoring survey, while attractive (438 subjects) and competent (438 subjects) are based on 438 respondents. The correlation matrix of CEOs' average rating on these traits is reported. The *p*-values are reported below correlations.

   ***Denotes significance at the 1% level.

Table 4. CEO Traits, Company Size, and Compensation

	Panel A					
Correlation coefficients	ln(sales)					
Competent (230 subjects)	0.187**					
Competent (438 subjects)		0.161*				
Attractive (230 subjects)			−0.023			
Attractive (438 subjects)				−0.023		
Likable (230 subjects)					−0.128	
Trustworthy (230 subjects)						0.003
	Panel B					
Correlation coefficients	ln(compensation)					
Competent (230 subjects)	0.215**					
Competent (438 subjects)		0.224***				
Attractive (230 subjects)			0.063			
Attractive (438 subjects)				0.075		
Likable (230 subjects)					−0.125	
Trustworthy (230 subjects)						−0.014
Number of CEOs	134	134	134	134	134	134

Notes. Respondents rate 134 CEOs on a scale of 1 to 5 with respect to competence, trustworthiness, likability, and attractiveness. Univariate correlations between these ratings and the total sales of the CEO's firm, and CEO compensation are reported. The variable ln(sales) is calculated as the log of the firm's sales and ln(compensation) is calculated as the log of CEO compensation (TDC1 in Execucomp) for fiscal year 2003. For those rated CEOs who stepped down or became CEO around 2003, the compensation and sales data in the nearest fiscal year in which the rated CEO is in office for at least three quarters are used instead. Attractive (230 subjects), competent (230 subjects), likable (230 subjects), and trustworthy (230 subjects) are based on 230 respondents in the numerical scoring survey, while attractive (438 subjects) and competent (438 subjects) are based on 438 respondents. The *p*-values are reported below correlation coefficients.

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

and 438 reflecting the combination of the first two waves, as described in §2.2). Table 3 suggests all four traits are positively related. The largest correlation is found between trustworthiness and likability; the smallest correlation is found between trustworthiness and attractiveness.

The initial analysis of facial traits and compensation is presented in Table 4. As mentioned earlier, we administered the rating of facial traits in two waves. The first (230 observations) scored all four traits. The second (208 observations) scored only two traits.

Table 4 shows simple correlation coefficients between the facial traits and both company size (as measured by the log of sales) and log total compensation.[5] Competence is significantly correlated with firm size as well as compensation. None of the correlation coefficients for the other three facial traits are significantly different from zero. The compensation result is consistent with the results in Table 2 that indicate that CEOs are perceived to be more competent than the control sample of non-CEOs who presumably earn more modest salaries. The compensation-competence result is even stronger in the augmented sample that includes 438 observations. However, given that competence is related to firm size, any inference regarding compensation and competence needs to control for firm size.[6]

3.3. The Pricing of Competent Looks
Table 5, panel A tests whether the pay of the CEO is affected by facial features, controlling for firm size

and industry. The estimation includes 7,449 observations (which come from 134 CEOs being rated by 230 subjects who each evaluated, on average, 34 CEOs). There are two estimation approaches: use all observations and cluster the standard errors at the CEO level or, alternatively, average the responses for a given CEO across all the subjects and then perform the regressions. Both approaches yield very similar results. To conserve space, we report only the latter results.

The results in Table 5 show that only "competent looks" and attractiveness are positively and significantly related to the CEO's pay after controlling for company size and industry controls. The attractiveness results are consistent with recent work by Halford and Hsu (2014).[7] The levels of statistical significance are modest. The other facial characteristics are insignificant in the compensation regressions. In terms of economic significance, the estimates from Table 4 suggest that increasing the competence rating from a mean of 3.3 by one standard deviation of 0.25 approximately translates into an 11% to 14% increase in total compensation for the CEO.

3.4. Interpretations of the Results
There are two candidate explanations for why CEOs with competent looks are paid more:

(i) Neoclassical: Faces may be an observable indicator for performance characteristics that earns a return in the labor market. Thus more competent-looking CEOs may actually be more competent on the job.

Table 5. CEO Traits and Compensation

	ln(compensation)					
Competent (230 subjects)	0.427 (0.282)					
Competent (438 subjects)		0.553** (0.278)				
Attractive (230 subjects)			0.296* (0.157)			
Attractive (438 subjects)				0.314* (0.160)		
Likable (230 subjects)					0.059 (0.229)	
Trustworthy (230 subjects)						0.136 (0.267)
ln(sales)	0.373*** (0.038)	0.373*** (0.038)	0.387*** (0.037)	0.387*** (0.037)	0.384*** (0.039)	0.383*** (0.038)
R^2	0.523	0.529	0.528	0.529	0.514	0.515
Number of CEOs	134	134	134	134	134	134

Notes. Regressions of the log of CEO compensation on facial traits and controls are reported. The sample includes 134 CEOs. The variable ln(sales) is calculated as the log of the firm's sales and ln(compensation) is calculated as the log of CEO compensation (TDC1 in Execucomp) for fiscal year 2003. For those rated CEOs who stepped down or became CEO around 2003, the compensation and sales data in the nearest fiscal year in which the rated CEO is in office for at least three quarters are used instead. Facial traits in the regression are CEO average ratings. Attractive (230 subjects), competent (230 subjects), likable (230 subjects), and trustworthy (230 subjects) are based on 230 respondents in the numerical scoring survey, while attractive (438 subjects) and competent (438 subjects) are based on 438 respondents. All regressions include industry fixed effects (one-digit Standard Industrial Classification level). The standard errors are reported under coefficients.
    *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

(ii) Behavioral: Faces may irrationally affect the perception of performance characteristics.

Our next tests attempt to distinguish between these two perspectives. To begin with, if more competent-looking CEOs are actually more competent, this should show up in their performance.

3.5. Facial Traits and Performance

Selecting a new CEO is perhaps the single most important task confronting any board of directors. Substantial data are gathered on past performance of CEO candidates, and unlike votes in the political process, the hiring decision is typically made by a small group of informed people with the aid of outside consultants. Yet our results suggest that competent looks matter for CEO pay. There is ample evidence in the psychology literature (see, e.g., Collins and Zebrowitz 1995, Zebrowitz 1997, Zebrowitz et al. 1998, Mobius and Rosenblat 2006) that what you see (facial traits) is not necessarily what you get. However, there is some controversy in the literature. For example, Duarte et al. (2012) have suggested that selection of loan applicants based on facial traits is related to performance.[8] Next, we test whether competent-looking CEOs are actually more competent in terms of running corporations.

In panel A of Table 6, we regress the return on assets (ROA) of the company on the facial traits of the CEO, after controlling for size of the company; industry; and ROA under the prior CEO. Previous research correlated total (unscaled) profit with facial traits. A large firm may have a relatively large profit, but have low profitability per unit of sales; that is, to draw proper inference, a variable measuring profitability should be scaled. Given our earlier evidence on the correlation between firm size and competence, any result based on unscaled total profit is difficult to interpret.

The results in Table 6, panel A, show that none of the facial traits are statistically significant and the point estimates are near zero.[9] These results, along with the results in Table 5, indicate that facial traits (competence and attractiveness) are related to compensation but none are related to performance. The compensation result is consistent with the "beauty premium" literature, which suggests that there is a wage premium for beauty.[10] However, we find no evidence to suggest that this wage premium is justified in terms of performance.

Another possible explanation for our results is that CEOs may extract the "rent" from CEO expected competence so that ROA is unrelated to appearance. That is, competent-looking CEOs may gather the economic surplus, leaving the companies' net performance unrelated to competent looks. To address this possibility, we conduct an additional test. We look at a modified measure of profitability where we take the net income of the company and add back to it the tax-adjusted wage of the CEO (approximately 60% of CEO compensation), normalized by total assets. We regress this modified measure of profitability on facial traits. The results in Table 6, panel B, are very similar to panel A: none of the facial traits are statistically significant with the point estimates continuing to be near zero.

Table 6. CEO Traits and Performance

Panel A: Return on assets						
Competent (230 subjects)	0.025 (0.041)					
Competent (438 subjects)		0.035 (0.041)				
Attractive (230 subjects)			−0.019 (0.023)			
Attractive (438 subjects)				−0.023 (0.024)		
Likable (230 subjects)					0.034 (0.033)	
Trustworthy (230 subjects)						0.055 (0.039)
ln(sales)	0.008 (0.006)	0.008 (0.006)	0.008 (0.006)	0.008 (0.006)	0.010* (0.006)	0.009 (0.005)
R^2	0.091	0.093	0.093	0.095	0.096	0.103
Number of CEOs	134	134	134	134	134	134
Panel B: Adjusted return on assets (including CEO compensation)						
Competent (230 subjects)	0.026 (0.041)					
Competent (438 subjects)		0.035 (0.041)				
Attractive (230 subjects)			−0.019 (0.023)			
Attractive (438 subjects)				−0.023 (0.024)		
Likable (230 subjects)					0.035 (0.033)	
Trustworthy (230 subjects)						0.056 (0.039)
ln(sales)	0.007 (0.006)	0.007 (0.006)	0.007 (0.006)	0.007 (0.006)	0.009 (0.006)	0.008 (0.005)
R^2	0.088	0.091	0.090	0.092	0.093	0.100
Number of CEOs	134	134	134	134	134	134

Notes. Regressions of the return on assets of rated CEOs on facial traits and controls are reported. The sample includes 134 CEOs. ROA is calculated as net income divided by total assets (NI/AT in Compustat), "Amended ROA" is calculated as (NI + 0.6 × CEO compensation)/AT, and ln(sales) is calculated as the log of the firm's sales for fiscal year 2003. For those rated CEOs who stepped down or became CEO around 2003, the income and sales data in the nearest fiscal year in which the rated CEO is in office for at least three quarters are used instead. Facial traits in the regression are CEO average ratings. Attractive (230 subjects), competent (230 subjects), likable (230 subjects), and trustworthy (230 subjects) are based on 230 respondents in the numerical scoring survey, while attractive (438 subjects) and competent (438 subjects) are based on 438 respondents. All regressions include industry fixed effects (one-digit Standard Industrial Classification level). The standard errors are reported under coefficients.

*Denotes significance at the 10% levels.

Our results indicate that selection on facial traits does not translate into performance. If such were the case, then CEOs with better facial traits should be paid more and should also perform better. To the contrary, we find, after controlling for important factors that affect compensation and performance that CEOs who look more competent are paid more but there is no evidence that their companies perform better. This is inconsistent with optimal selection based on looks or some other performance-based aspect that is correlated with looks.

Next we further explore the neoclassical versus behavioral interpretations by separating CEOs by whether they are internal or external hires. Given that there is much more information about an internally promoted CEO, facial traits may be less important.

3.6. Internal vs. External Hires

In an internal hiring decision, most often many members of the board of directors will have interacted with the CEO candidate over a number of years. They will have collected information based on their

Table 7. CEO Traits and Compensation: Externally Hired vs. Internally Promoted CEOs

	ln(compensation)					
Panel A: External hires						
Competent (230 subjects)	0.918* (0.479)					
Competent (438 subjects)		0.836* (0.477)				
Attractive (230 subjects)			0.376 (0.283)			
Attractive (438 subjects)				0.433 (0.302)		
Likable (230 subjects)					−0.123 (0.418)	
Trustworthy (230 subjects)						0.058 (0.530)
ln(sales)	0.380*** (0.069)	0.382*** (0.070)	0.371*** (0.070)	0.371*** (0.070)	0.354*** (0.073)	0.360*** (0.074)
R^2	0.625	0.619	0.605	0.608	0.586	0.585
Number of CEOs	46	46	46	46	46	46
Panel B: Internal hires						
Competent (230 subjects)	0.314 (0.362)					
Competent (438 subjects)		0.589 (0.358)				
Attractive (230 subjects)			0.282 (0.201)			
Attractive (438 subjects)				0.297 (0.200)		
Likable (230 subjects)					0.250 (0.282)	
Trustworthy (230 subjects)						0.232 (0.320)
ln(sales)	0.395*** (0.049)	0.388*** (0.048)	0.411*** (0.048)	0.411*** (0.047)	0.414*** (0.049)	0.407*** (0.048)
R^2	0.564	0.575	0.571	0.572	0.564	0.563
Number of CEOs	84	84	84	84	84	84

Notes. Regressions of the log of CEO compensation on facial traits and controls are reported. The variable ln(sales) is calculated as the log of the firm's sales and ln(compensation) is calculated as the log of CEO compensation (TDC1 in Execucomp) for fiscal year 2003. For those rated CEOs who stepped down or became CEO around 2003, the compensation and sales data in the nearest fiscal year in which the rated CEO is in office for at least three quarters are used instead. Externally hired CEOs are defined as those who became CEO within 12 months from joining the firm. Facial traits in the regression are CEO average ratings. Attractive (230 subjects), competent (230 subjects), likable (230 subjects), and trustworthy (230 subjects) are based on 230 respondents in the numerical scoring survey, while attractive (438 subjects) and competent (438 subjects) are based on 438 respondents. Panel A considers only 46 externally hired CEOs and panel B considers only 84 internally promoted CEOs. All regressions include industry fixed effects (one-digit Standard Industrial Classification level). The standard errors are reported under coefficients.

* and *** denote significance at the 10% and 1% levels, respectively.

own personal observations of performance. Given their knowledge of the business, they may even be able adjust the candidate's track record for extraordinary factors beyond the candidate's control. External hires are a different story. There is often no direct interaction other than the interview process and first impressions could be important. The external track record is more difficult to interpret and often a consultant is involved in both identifying the candidate and performing due diligence. Given this natural information asymmetry,

the behavioral interpretation would suggest that the Board is more likely to thin slice when it comes to the external candidate.

Starting with Execucomp, we identify which CEOs are promoted from within the company and which CEOs are hired externally. We compare the date when the executive joins the company and the date he becomes CEO. If this exceeds 12 months, we classify this as an internal promotion. In cases for which the data are missing on either the joining date or the

Table 8. Correlation Between Baby-Faced and Other Facial Traits

	CEO average ratings					
	Competent (230 subjects)	Competent (438 subjects)	Attractive (230 subjects)	Attractive (438 subjects)	Likable (230 subjects)	Trustworthy (230 subjects)
Baby-faced	−0.231***	−0.254***	0.092	0.071	0.197**	−0.022
	(0.007)	(0.003)	(0.288)	(0.411)	(0.022)	(0.801)
Number of CEOs	134	134	134	134	134	134
Number of respondents	230	438	230	438	230	230

Notes. CEOs are rated on a scale of 1 to 5 on being "baby-faced," with 5 being the most "baby-faced." Attractive (230 subjects), competent (230 subjects), likable (230 subjects), and trustworthy (230 subjects) are based on 230 respondents in the numerical scoring survey, whereas attractive (438 subjects) and competent (438 subjects) are based on 438 respondents. The correlation of CEOs' average baby-faced rating with their average competence, trustworthiness, likability, and attractiveness are reported. The *p*-values are reported below correlations.
** and *** denote significance at the 5% and 1% levels, respectively.

becoming CEO date or inconsistencies, we search external news sources and websites to determine if they are internal or external hires. Overall we are able to identify 46 externally hired CEOs and 84 internally promoted CEOs.

Table 7 analyzes the relationship between compensation and looks—splitting the sample by internal and external hires. The results suggest that for external hires, competent looks are significantly related to compensation. For internal hires, competent looks do not matter, and the difference between the two is statistically significant. We confirm further, as in Table 6, that the performance of the company, as measured by ROA, is not affected by the look of competence for either internal or external hires. These results are consistent with the behavioral interpretation: in a situation where there is less information, directors are more likely to make decisions based on first impressions, which are likely influenced by a candidate's facial traits.[11]

3.7. Maturity and Competence
Finally, we explore the origins of competent looks. Prior research has linked competent looks or likability to intrinsic baby-faced or mature facial attributes. Berry and McArthur (1985) suggest that these traits are scientifically measurable as opposed to being subjective. Hence, we employed 10 Ph.D. students who were trained to identify the objective attributes of baby-facedness to score our sample of CEOs.

Table 8 presents the bivariate correlations between baby-faced and the four facial traits. Competence is negatively and significantly correlated (at the 1% level) with baby-facedness, so in the earlier experiment, subjects are probably classifying CEOs with mature faces as being competent. Neither attractiveness nor trustworthiness is significantly correlated with mature features and likability is marginally significant. These results suggest that differences in the perception of competence (and to some degree likability) are significantly driven by degree of baby-faced appearances.

4. Conclusions
Intriguing research in political science shows that subjects can accurately identify the winner of a congressional election simply by looking at the face of the candidates for a few seconds. Although it is plausible that a number of voters might be influenced by appearance, it seems far less likely that the process of CEO selection would be influenced by facial traits. However, this is exactly what we find. In addition, we show that certain facial characteristics, in particular competent looks, command a premium in terms of compensation, but looks do not matter when it comes to on-the-job performance of the CEO.

We conduct four different experiments involving about 2,000 subjects. We establish two initial findings: CEOs are perceived to look more competent than non-CEOs and large-firm CEOs are perceived to look more competent than smaller-firm CEOs.

Whereas recent research has promoted the idea of a beauty premium, our results, in contrast, show that "competent" looks are reflected in CEO compensation. A one standard deviation increase in the competence facial trait is associated with an 11% to 14% increase in total compensation. The economic magnitude of this effect is large; in 2012 the average CEO pay in S&P 500 firms is $12.25 million and 14% represents $1.72 million.

While these results are provocative, we push further and try to explain these findings. We consider two explanations. A neoclassical perspective would suggest that looks are correlated with some other innate attributes. In contrast, a behavioral explanation would argue that it is possible that the board of directors is thin slicing.

Our evidence weighs in favor of the behavioral explanation. If competent looks simply manifest some other valued managerial characteristics (as the neoclassical hypothesis would predict), we would expect that more competent-looking managers perform better at their firm. However, this is not what we find. There is

no significant relation between facial traits and corporate performance.

Another experiment separates our CEO sample into two groups: those that were hired from within the firm and those that were recruited from another organization. Given that there is far less information on external candidates, it seems more likely that the board of directors would be susceptible to thin slicing. This is consistent with what we find. For external hires, there is a significant relation between looks and compensation. For internal hires where the board has private information, there is no relation between looks and remuneration.

Finally, we explore and have some success in objectively classifying the specific facial features that lead subjects to judge a candidate as "competent."

Our results have important implications for organizational governance. Ideally, corporate directors should realize that what you see is not necessarily what you get.

Acknowledgments

Endnotes

[1] See also Biddle and Hamermesh (1998) and Mobius and Rosenblat (2006).

[2] We were unable to find an adequate control photo for some of the 90 CEO photos, and also dropped the female CEOs, which explains why the sample contains 86 rather than 90.

[3] The email to University of North Carolina (UNC) students was sent from our nber.org email addresses to avoid any Duke/UNC rivalry effects and to maximize the response rate.

[4] Given our knowledge of these two companies, we do not believe they have any unusual characteristics that would influence the results.

[5] Total compensation ("TDC1" in Execucomp) includes salary, bonus, other annual compensation, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and all other compensation.

[6] See Bebchuck and Grinstein (2005) for an overview on executive pay.

[7] Halford and Hsu (2014) use the facial geometry algorithm developed by anaface.com to score facial attractiveness and find a positive association between their measure of attractiveness and compensation.

[8] Also see Ravina (2012), who looks at beauty and credit markets. In addition, Berry (1990) and Rind and Gaudet (1993) test if individuals can accurately judge certain personality dispositions of unacquainted peers after viewing facial photographs of them.

[9] Halford and Hsu (2014) find some correlation between performance and the anaface.com index of attractiveness. Unfortunately, it is difficult to know what is being measured given that the algorithm is proprietary. Although the authors argue their method avoids the subjective evaluation in the experimental setting, both the selection of traits and the weighting of traits in the anaface.com algorithm is subjective—and unknown.

[10] See, for example, Andreoni and Petrie (2008), who use lab experiments to assess the effect of beauty and gender on earnings.

[11] Barberis et al. (2016) show that system 1 decision making (quick decisions based on first impressions) appears to be priced in the equity market.

References

Andreoni A, Petrie R (2008) Beauty, gender and stereotypes: Evidence from laboratory experiments. *J. Econom. Psych.* 29(1): 73–93.

Barberis N, Mukherjee A, Wang B (2016) Prospect theory and stock returns: An empirical test. Working paper, Yale University, New Haven, CT.

Bebchuck L, Grinstein Y (2005) The growth of executive pay. *Oxford Rev. Econom. Policy* 21(2):283–303.

Berry DS (1990) Taking people at face value: Evidence for the kernel of truth hypothesis. *Soc. Cognition* 8(4):343–361.

Berry DS, McArthur LZ (1985) Some components and consequences of a babyface. *J. Personality Soc. Psych.* 48(2):312–323.

Biddle JE, Hamermesh DS (1998) Beauty, productivity, and discrimination: Lawyers' looks and lucre. *J. Labor Econom.* 16(1):172–201.

Collins MA, Zebrowitz LA (1995) The contributions of appearance to occupational outcomes in civilian and military settings. *J. Appl. Soc. Psych.* 25(2):129–163.

Duarte J, Siegel S, Young L (2012) Trust and credit. The role of appearance in peer-to-peer lending. *Rev. Financial Stud.* 25(8): 2455–2484.

Gomulya D, Wong EM, Ormiston ME, Boeker W (2015) The role of facial appearance on CEO selection after firm misconduct. Working paper, University of California, Riverside, Riverside.

Halford JT, Hsu SHC (2014) Beauty is wealth: CEO appearance and shareholder value. Working paper, University of Wisconsin Milwaukee, Milwaukee.

Hamermesh DS, Biddle JE (1994) Beauty and the labor market. *Amer. Econom. Rev.* 84(5):1174–1194.

Mayew WJ, Parsons CA, Venkatachalam M (2013) Voice pitch and the labor market success of male chief executive officers. *Evolution Human Behav.* 26(4):243–248.

Mobius MM, Rosenblat TS (2006) Why beauty matters. *Amer. Econom. Rev.* 96(1):222–235.

Ravina E (2012) Love & loans: The effect of beauty and personal characteristics in credit markets. Working paper, Columbia Business School, New York.

Rind B, Gaudet S (1993) Judging personality traits of adolescents from photographs. *J. Soc. Psych.* 133(6):815–823.

Rule NO, Ambady N (2008) The face of success. *Psych. Sci.* 19(2): 109–111.

Todorov A, Mandisodza AN, Goren A, Hall CC (2005) Inferences of competence from faces predict election outcomes. *Science* 308(5728):1623–1626.

Zebrowitz LA (1997) *Reading Faces: Window to the Soul?* (Westview Press, Boulder, CO).

Zebrowitz LA, Montepare JM (2005) Appearance DOES matter. *Science* 308:1565–1566.

Zebrowitz LA, Adreoletti C, Collins MA, Lee SY, Blumenthall J (1998) Bright, bad, babyfaced boys: Appearance stereotypes do not always yield self-fulfilling prophecy effects. *J. Personality Soc. Psych.* 75(5):1300–1320.