Scientometrics (2015) 104:555–573
DOI 10.1007/s11192-015-1623-5

Scholars' physical appearance, research performance, and feelings of happiness

Alexander Dilger[1] · **Laura Lütkenhöner**[1] · **Harry Müller**[1]

Received: 2 November 2014 / Published online: 20 June 2015

Abstract Our study aims to analyse whether former feelings of happiness and/or physical appearance are significantly correlated with the subsequent observable research performance of scholars. To the best of our knowledge, both has not been analysed previously. To do so, we photographed 49 persons attending the 72nd annual conference of the German Academic Association for Business Research (VHB), which took place in Bremen in 2010. We interviewed them about their feelings of happiness. Later we asked students to evaluate the photographed persons' attractiveness, competence, trustworthiness, likeability and their feelings of happiness. To determine the academics' research performance we compiled a list of their recent journal publications, considering different journal weights and dividing them by the number of authors. Regression analyses reveal significant relationships between feelings of happiness in 2010 and research performance in 2011/2012. Conversely, we cannot observe significant relationships between previous research performance and subsequently reported feelings of happiness. Even though at first glance one would not expect that physical appearance is relevant for research output we find significant relationships. While previous studies show that scholars' evaluations of teaching are influenced by attractiveness, our results suggest that research performance is not influenced by attractiveness but especially by (perceived) trustworthiness. Our data also reveal a weakly significant correlation between scholars' perceived feelings of happiness and their reported feelings of happiness.

Keywords Feelings of happiness · Individual characteristics · Physical appearance · Research performance · Scholars of business administration · Trustworthiness

Mathematics Subject Classification 62P20

✉ Alexander Dilger
alexander.dilger@uni-muenster.de

[1] Institute for Organisational Economics, University of Münster, Scharnhorststr. 100, 48151 Münster, Germany

JEL Classification I23 · J01 · M00 · M50

Introduction

In recent years various methods have been developed to measure research performance and several rankings (like *Handelsblatt-BWL-Ranking 2012* in Germany) have been published sorting scholars by the results of these measures. Against this background, identifying factors influencing scholars' (measurable) research performance is of increasing importance not only for dealing with corresponding rankings but also for individual scholars. Previous studies have already found a series of factors influencing individual research performance, including institutional and structural predictors (see e.g. Ramsden 1994; Hedjazi and Behravan 2011), demographic characteristics, such as researchers' age, gender and education (for an overview of studies on these determinants see Gonzalez-Brambila and Veloso 2007, p. 1038; Puuska 2010, p. 421/422) and individual characteristics, such as motivation (see e.g. Harris and Kaine 1994; Ramsden 1994), professional position in academia (see e.g. Puuska 2010), career path (see e.g. Fukuzawa 2014), creativity and working habits (see e.g. Hedjazi and Behravan 2011). In addition Bauer et al. (2013) show that publication and citation counts might be predicted by interactions of individual and organisational characteristics. However, to the best of our knowledge, previous studies have neither analysed the relevance of physical appearance nor the relevance of feelings of happiness for successful research.

Even though at first glance this idea seems to be abstruse, a relationship between scholars' physical appearance and their research performance might exist. Previous studies have already shown that a favourable physical appearance fosters work-related success (see e.g. Hamermesh and Biddle 1994; Mobius and Rosenblat 2006) and may also give rise to better evaluations of written text (Landy and Sigall 1974) and better student evaluations of teaching (see e.g. Felton et al. 2008). When reviewers know the authors' names, they might find their photos on the internet. In some cases they might also have seen the author at a conference. Therefore it cannot be excluded that manuscripts submitted to a journal have a higher chance of acceptance when the author looks for example very trustworthy or competent. Hence scholars' physical appearance might affect the total amount of publications as well as the impact factors of the publications. For journals which apply a double-blind peer-review process, at least the editor knows the author's name. Moreover, authors often cite themselves and from these citations their names can be revealed irrespective of the review process. The idea of an existing relationship between feelings of happiness and research performance is supported by the finding that happiness positively affects creativity (Pannells and Claxton 2008). A relationship between feelings of happiness and successful research would also correspond to previous studies suggesting a positive influence of feelings of happiness on work-related success (Graham et al. 2004; Diener et al. 2002).

This paper explores whether former feelings of happiness and/or physical appearance are significantly correlated with the subsequent observable research performance of scholars. Both do not seem to have been object of systematic analysis in previous studies. The next section gives an overview of the related literature. The Sect. "Data and method" describes our data and the method. We report our main empirical results in the Sect. "Empirical results" and discuss them in Sect. "Discussion". Section "Conclusion" concludes.

Related literature

Our study is related to two distinct literatures. The first set of studies demonstrates that physical appearance has a positive effect on work-related success in various professional fields. Rule and Ambady (2008) and Graham et al. (2010) found that CEOs' facial attributes affect their work-related success. Rule and Ambady (2008) asked 50 undergraduates to make judgements on the faces of photographed CEOs (only men) from 50 companies of the Fortune 1000 with respect to five dimensions of physical appearance: competence, dominance, likeability, facial maturity and trustworthiness. They found that power-related traits (competence, dominance and facial maturity) from CEOs' faces were significantly related to company profits [$r(41) = 0.36$; $p < 0.025$]. Graham et al. (2010) ran several experiments in which persons evaluated the photographs of CEOs in terms of beauty, competence, trustworthiness, and likeability. They reported that competent looking CEOs tend to earn higher wages. In an earlier study Biddle and Hamermesh (1998) have shown, that better-looking attorneys achieved a higher income.

In addition, several studies reveal that physical appearance affects politicians' electoral success. This has been shown for elections in several countries, such as Germany (Klein and Rosar 2005; Rosar et al. 2008), America (Todorov et al. 2005) and Australia (King and Leigh 2009). Significant correlations between physical appearance and success have also been observed for professional athletes. For instance, a study of Postma (2014) shows a significant positive relationship between professional cyclists' attractiveness and their performance. Moreover, a series of papers suggests that attractive lecturers receive better student evaluations of teaching (Goebel and Cashen 1979; Hamermesh and Parker 2005; Riniolo et al. 2006; Felton et al. 2008; Rosar and Klein 2009). However, for female lecturers the results of Rosar and Klein (2009) indicate a curvilinear correlation with average looking female lecturers receiving better student evaluations than their very attractive colleagues, while Riniolo et al. (2006) report that professors perceived as attractive receive better student evaluations regardless of their gender. However, to the best of our knowledge, possible relations between research performance and academics' physical appearance have not been analysed yet.

The second set of studies suggests a positive influence of feelings of happiness on work related success. Graham et al. (2004) found that people who were happier in 1995 reported (in a survey) to have a higher income 5 years later. This result is based on 4457 observations, which are part of a large panel for Russia: the Russia Longitudinal Monitoring Survey. The panel contains observations on happiness and income for respondents who were questioned at different points of time. Such data is very rare. Diener et al. (2002) conducted another longitudinal study over a 19-year period. Their analysis showed "that individuals with a higher cheerfulness rating at college entry have a higher current income and a higher job satisfaction rating and are less likely ever to have been unemployed than individuals with a lower cheerfulness rating" (Diener et al. 2002, p. 229). Boehm and Lyubomirsky (2008) and Lyubomirsky and King (2005) conducted meta-analyses and also found evidence that happiness promotes career success. In addition, Hom and Arbuckle (1988) found in an experiment with young children that a happy mood state has a significant positive effect on goal setting and on performance. Although previous studies analysed emotions in higher education workplace (see e.g. Woods 2012), relationships between (not necessarily work-related) feelings of happiness and successful research does not seem to have been subject of systematic analysis.

Data and method

Feelings of happiness and physical appearance

We took portrait photographs of scholars attending the 72nd annual conference of the German Academic Association for Business Research (VHB) in Bremen in the year 2010. We also interviewed them about their feelings of happiness. In total, pictures of 60 people were taken. The results presented in Sect. "Empirical results", however, only refer to those interviewees who agreed to answer our question about their feelings of happiness, who had published at least one article in an academic journal in the period from 2005 to 2012 and whose exact age was traceable. This group of scholars consists of 14 women and 35 men. The respective photos were taken on May 28th, 2010. At that time the majority of the photographed persons held at least a doctoral degree and many of them were university professors. To inquire about their feelings of happiness we used a Likert scale ranging from 0 (very unhappy) to 10 (very happy).

Evaluation of the photographed scholars

Scholars' physical appearance was quantified by applying the truth-of-consensus method (Patzer 1983). This method is used as a standard procedure in attractiveness-research (Rosar et al. 2008). According to this method the physical appearance of a scholar is the arithmetic average of the ratings he or she obtains from different persons. Rosar et al. (2008) report that applying the truth-of-consensus method an attractiveness score can be calculated by using a small number of independent persons who rate the attractiveness.

In this study we designed an online-survey, asking students of the University of Münster to look at the photos and to assess the photographed persons' attractiveness, competence, trustworthiness, likeability and their feelings of happiness.[1] The survey was conducted using the online evaluation system EvaSys.[2] In order to evaluate the photos the students used a Likert scale from zero to ten, with ten representing the best possible score. Each participant was asked to look at 20 pictures one after another. The order of the pictures was determined by chance. In total, twelve different questionnaires were created. Each questionnaire comprised 20 of the 60 pictures and each picture was presented in four of these questionnaires. The students were not informed that they were evaluating scholars.

In the summer semester of 2011 an invitation to participate in the online survey was sent to 364 students via e-mail. Those students were selected out of three different business administration lectures at the Institute for Organisational Economics at the University of Münster. One of these lectures consisted only of students enrolled in the master course *Business Administration*. The other two lectures were particularly addressed to students enrolled in dual-subject Bachelor programs (for example *Economics and Law* or *Politics and Economics*). The twelve different questionnaires were evenly distributed to the participants of each lecture.[3] Thus, each picture had the chance to be evaluated by the same number of students. In total 86 students (62 women and 24 men) participated in the online survey. The rate of return was 23.63 %. The respondents' age varied between 17 and 30 years, averaging 23 years. Each picture was assessed by at least 19 and at most 37

[1] Graham et al. (2010) also considered four of these dimensions: beauty, competence, trustworthiness, and likeability.

[2] The main function of this system is to collect student evaluations of teaching.

[3] None of the contacted students participated in more than one of the three lectures.

Table 1 Standard deviation of scholars' physical appearance scores

Dimension of physical appearance	*N*	Min	Max	Mean
Attractiveness	60	1.16	2.33	1.80
Competence	60	1.11	2.43	1.66
Trustworthiness	60	1.15	2.67	1.76
Likeability	60	1.21	2.57	1.82
Happiness	60	1.08	2.19	1.53

students. On average each picture was evaluated by 28.5 students (with a SD of 4.35). Our study follows the approach of Rosar et al. (2008), where "[each] package of photographs was rated by an average of 28.6 raters (standard deviation: 3.70)".

Table 1 summarises descriptive statistics concerning the SD of scholars' physical appearance scores. Remarkably the minimum, the maximum, and the mean are quite similar for all of the five dimensions of physical appearance. This indicates that the results of the attractiveness research are transferable to the other dimensions of physical appearance which we also consider in our study (perceived competence, trustworthiness, likeability and happiness).

To test for the internal consistency of the evaluations, attractiveness-researchers usually calculate Cronbach's alpha (Rosar et al. 2008). In our study the groups of students having filled out the same questionnaire are quite small. Each group consists of at least 4 and at most 13 students. For these groups Cronbach's alpha amounts on average to 0.80 for the attractiveness scores, 0.62 for the competence scores, 0.66 for the trustworthiness scores, 0.70 for the likeability scores and 0.73 for the happiness scores. By tendency, Cronbach's alpha has higher values for our larger groups. The values are particularly low for the two groups consisting of only four students. However, it should be noted that each scholars' photo was evaluated by at least 19 students.

Torgler et al. (2008) found that female responders perceived the presented (solely male) researchers to be happier than male respondents. In our study the proportion of female students ranges from 67 to 81 %. To analyse whether this proportion has an influence on the average physical appearance scores we calculated linear regressions using three explanatory variables: (1) the proportion of female students, (2) scholars' age, and (3) scholars' gender. The results (which are presented in Appendix 1) show that the proportion of female students does not significantly influence any of the five dimensions of physical appearance. For this reason it seems appropriate to combine evaluation scores by female and male students.

To reduce dimensionality, the principal component procedure of SPSS was used considering all five dimensions of physical appearance. The Kaiser–Meyer–Olkin measure of sampling adequacy is 0.559. Values above 0.5 are considered to be acceptable in order to reliably use a factor analysis for data analysis (Kaiser and Rice 1974). The Bartlett's test of sphericity is 293.91 with a significance level of $p < 0.00$. A significant value indicates that the data are appropriate for a principal component analysis (Dziuban and Shirkey 1974). The results of the principal component analysis reveal that a single factor loads for the five dimensions of physical appearance. With the assistance of SPSS, factor scores were saved in a new variable using the regression method. This new variable was denoted *overall physical appearance*. Its mean is standardised to zero and the variance is standardised to one.

Research performance

To quantify research performance of the photographed persons, a list of their respective publications in academic journals in recent years was compiled. To that end we looked at their publication lists in the internet and we used the program *Publish or Perish 3* that informs about publications in the database of *Google Scholar*. For each journal we looked up the journal weights in the *Handelsblatt-BWL-Ranking 2012* (0.1–1.0) and in the *VHB-JOURQUAL 2.1 Ranking* ($A+$ to E, with an $A+$ representing the highest weight). Another possibility to operationalise research performance includes the usage of citations (see e.g. Dilger and Müller 2012; Bauer et al. 2013; Fukuzawa 2014). Citation and publication records are highly correlated. Bosquet and Combes (2013, p. 843) report that "having published five single-author equivalent articles instead of four increases Google Scholar total citations by 22.4 %". However, since we are especially interested in the research performance in the last years, we did not pursue this approach. Many of the articles included in our analysis have been published quite recently and thus have not yet been cited, at least not very often. Still another method to evaluate research performance would be to use the impact factors of the journals. For two reasons we did not follow this approach. First, the impact factors of journals measure the average number of citations of the articles in the journals while the actual numbers for individual articles can be very different. Even in top-journals most articles are not cited at all while a few articles get a lot of citations. Second, the impact factors depend on the special subject and are more adequate for the USA than Germany where they are not measured for many journals at all. The two German rankings we use are more suited for our purpose to compare the research performance of German scholars.

According to the approach of the *Handelsblatt-BWL-Ranking 2012* (Schläpfer and Storbeck 2012), we also transformed the scale of the *VHB-JOURQUAL 2.1 Ranking* to a scale ranging from 0 to 5 ($A+ = 5$; $A = 4$; $B = 3$; $C = 2$; $D = 1$; $E = 0$). On the basis of this data, we generated three indices to quantify the research performance. All indices have in common that the journal weights have been divided by the number of authors. The indices are equivalent to the sum scores of the publications in the considered years. The index *Handelsblatt2012* is based on the *Handelsblatt-BWL-Ranking 2012* and the index *JQ2.1* is based on the *VHB-JOURQUAL 2.1 Ranking*. In the index *ref.Journal* all journals have the same weight and we only considered journals applying a peer-review process. To identify these journals we used the *JournalRankingGuide* provided by the ZBW (Leibniz Information Centre of Economics) and IAB (Institute for Employment Research).

Statistical evaluation

We used *IBM SPSS Statistics 21 and Stata/SE 13.1* for the statistical evaluation of the data. In total we computed six Tobit regression models for each of the three measures of research performance. The models differ in respect to the considered dimension of physical appearance. We always included gender and age of the photographed persons as control variables. To consider non-linear relations between age and research performance, age squared was included in all models. In addition we controlled for the academic position.

Empirical results

Our data comprises 14 female and 35 male scholars in economics. A summary of the statistics for the variables used in this study is given in Table 2.

Table 2 Overview of descriptive statistics

	Min	Max	Median	Mean	SD
Age (2010)	26	71	40.00	40.90	10.26
Feelings of happiness (2010)	2	10	8.00	7.73	1.87
Physical appearance (2010)					
Attractiveness	2.62	7.10	4.75	4.75	1.09
Competence	5.49	8.92	7.29	7.19	0.82
Trustworthiness	4.38	8.46	6.96	6.88	0.84
Likeability	4.50	8.54	6.89	6.76	1.00
Happiness	5.29	8.93	7.55	7.32	0.89
Overall	−1.99	1.69	0.00	0.02	0.97
Research performance 2011/2012					
Handelsblatt2012	0.00	1.43	0.23	0.33	0.37
JQ2.1	0.00	10.38	2.00	2.93	2.80
ref.Journal	0.00	3.98	0.83	1.04	1.04

$N = 49$ scholars

The photographed persons' age, their feelings of happiness and their physical appearance refer to the year in which we took the photos (2010) while the research performance refers to the years 2011 and 2012. The mean values of the indices for calculated research performance differ because of diverging journal weights. A consideration of the different dimensions of physical appearance shows that *attractiveness* has the lowest average score while *happiness* has the highest average score.

In addition, Appendix 2 presents results of Mann–Whitney-*U*-Tests, revealing that female scholars were perceived to be more trustworthy and likeable than their male colleagues. The difference is significant at the 0.05 level and amounts to 0.56 (trustworthiness) and 0.59 (likeability) score points. Index *JQ2.1* shows a weak significant difference between male and female scholars. More precisely, male scholars have a higher mean value than female scholars. This indicates that male scholars publish more often than female scholars and/or male scholars publish in higher ranked professional journals. However, female and male scholars do not significantly (not even weakly) differ in the indices *Handelsblatt2012* and *ref.Journal* that also measure research performance.

Correlation analyses were conducted to examine the relations between gender, age, feelings of happiness, physical appearance and research performance in 2011/2012. The results are presented in Appendix 3. All three measures of research performance are significantly correlated between themselves ($p \leq 0.001$). The same applies to all dimensions of physical appearance. In most cases these variables are also significantly (at least weakly at the 0.1 level) positively correlated with the measures of research performance in 2011/2012. However, the correlations between feelings of happiness reported in 2010 and research performance in 2011/2012 are weakly significant in only one of the three cases (*ref.Journal*). Age and feelings of happiness are correlated significantly positively, while age and attractiveness are correlated significantly negatively. This indicates that, compared to younger scholars, older scholars are happier but less attractive. In addition, Appendix 3 illustrates that perceived feelings of happiness are weakly significantly correlated with scholars' reported feelings of happiness. This result is especially interesting in view of the study conducted by Torgler et al. (2008), which analysed citizens' perceived happiness of

12 superstars in the field of economics but did not ask them about their feelings of happiness.

Tobit regressions were conducted to determine whether research performance in 2011/2012 (dependent variable) could be predicted from feelings of happiness in 2010 as well as physical appearance. Table 3 reveals these results. Overall we calculated 18 models. They differ in respect to the dimensions of physical appearance and in respect to the measure of research performance. The results suggest a significant positive relationship at the level of at least 0.05 between feelings of happiness in 2010 and the research performance in 2011/2012. This finding is robust for all models considering different dimensions of physical appearance and it is also robust for the three different kinds of operationalization of research performance in 2011/2012. In six out of our 18 models scholars' reported feelings of happiness in 2010 are significant on the 0.01 level. In 12 models the significance level is 0.05.

Moreover, regardless which of the three indices for research performance in 2011/2012 is chosen as the dependent variable, regression analyses show a significant positive relationship between a trustworthy appearance and research performance. This indicates that scholars who are perceived to be more trustworthy publish more and/or publish in academic journals featuring higher impact factors. Considering perceived trustworthiness, in two of the three models the significance level of trustworthiness is 0.01, in one model it is 0.05.

The relationship between the overall physical appearance in 2010 (the result of a principal component analysis with *IMB SPSS Statistics 21*) and the research performance in 2011/2012 is somewhat weaker. The relationship is significant ($p \leq 0.01$) with *Handelsblatt2012* as the dependent variable and it is weakly significant ($p \leq 0.10$) with *JQ2.1* as the dependent variable. However, the relationship is not significant at all when *ref.Journal* is the dependent variable. When *Handelsblatt2012* is the dependant variable, a higher research performance comes along with significantly higher values for perceived likeability ($p \leq 0.01$) as well as significantly higher values for perceived happiness ($p \leq 0.05$). When *JQ2.1* is the dependent variable perceived likeability is only weakly significant, while perceived happiness is not significant at all. Both variables (perceived likeability and perceived happiness) are not significant when *ref.Journal* is the dependent variable. In addition, in the models presented in Table 3 it could not be observed that scholars' research performance in 2011/2012 is significantly correlated with their attractiveness and/or their perceived competence.[4]

Apart from feelings of happiness and physical appearance, the results presented in Table 3 suggest that male gender increases research performance. In two out of our 18 models the gender variable is significant on the 0.001 level. In ten models the significance level is 0.01 and in six models it is 0.05. The variables *Age* and Age^2 are both significant (respectively weakly at the 0.1 level) in 8 of our 18 models. In all these cases the algebraic signs of the age variables indicate that the research performance follows a U-shaped curve. This indicates that, compared to middle-aged scholars, younger and older scholars (but not retired scholars) publish more often and/or publish in professional journals featuring higher

[4] Variants of the models presented in Table 3, which can be send on request, either consider reported feelings of happiness in 2010 or one of the physical appearance scores. The modified models show the same significant relationships between research performance and feelings of happiness respectively research performance and physical appearance. The significance levels are the same or even higher. In two models using *ref.Journal* as dependent variable the physical appearance scores for likeability and the overall physical appearance (which are insignificant in the original models) reaches the significance level 0.05 (likeability) respectively 0.10 (overall).

Table 3 Tobit regressions for research performance in 2011/2012 with different dimensions of physical appearance

	Handelsblatt2012						JQ2.1		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3
Gender (male = 1)	0.330*	0.272*	0.462***	0.406**	0.335**	0.370**	2.621**	2.290*	3.619***
Age (2010)	−0.098	−0.114*	−0.088(*)	−0.091(*)	−0.096(*)	−0.081	−0.851(*)	−0.831*	−0.646
Age^2 (2010)	0.001(*)	0.001*	0.001(*)	0.001(*)	0.001*	0.001(*)	0.010*	0.010*	0.008(*)
Academic position									
Not appointed as professor yet or before 2011	0.385*	0.396*	0.489**	0.449*	0.441*	0.461*	1.469	1.521	2.257(*)
Appointed as professor in 2009/2010	0.374(*)	0.402*	0.448*	0.430*	0.430*	0.398*	1.911	1.776	2.180(*)
Emeritus before 2011	−1.462*	−1.488**	−1.139*	−1.211*	−1.436**	−1.149*	−11.106*	−10.016*	−7.665*
Feelings of happiness (2010)	0.092**	0.095**	0.085**	0.076*	0.080*	0.082*	0.596*	0.597*	0.531*
Physical appearance (2010)	A	C	T	L	H	Overall	A	C	T
	0.075	0.114	0.251**	0.168**	0.141*	0.174**	0.202	0.782	1.750**
Constant	0.485	0.438	−1.066	−0.347	−0.152	0.572	10.778	6.415	−4.399
Pseudo R^2	0.311	0.325	0.450	0.395	0.352	0.397	0.077	0.085	0.118

	JQ2.1			ref.Journal					
	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Gender (male = 1)	3.032**	2.663**	2.884**	0.888*	0.840*	1.220**	1.056**	0.926*	0.985**
Age (2010)	−0.748(*)	−0.804(*)	−0.672	−0.239	−0.215	−0.144	−0.167	−0.186	−0.157
Age^2 (2010)	0.009(*)	0.010*	0.008(*)	0.003	0.003	0.002	0.002	0.002	0.002
Academic position									
Not appointed as professor yet or before 2011	1.819	1.748	1.880	0.868	0.893(*)	1.127*	1.008(*)	0.980(*)	1.006(*)
Appointed as professor in 2009/2010	2.066	2.097	1.859	1.079(*)	1.015(*)	1.096*	1.059*	1.066*	1.004(*)
Emeritus before 2011	−9.350*	−10.720**	−8.691*	−3.594*	−3.218*	−2.251	−2.662(*)	−3.141*	−2.636(*)
Feelings of happiness (2010)	0.513*	0.543*	0.526*	0.276**	0.274**	0.251**	0.242*	0.253*	0.252*

Table 3 continued

	JQ2.1			ref.Journal					
	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Physical appearance (2010)	L	H	Overall	A	C	T	L	H	Overall
	0.804(*)	0.560	0.929(*)	0.014	0.145	0.552*	0.289	0.205	0.276
Constant	4.529	6.915	8.509	2.095	0.606	−3.680	−1.280	−0.490	0.459
Pseudo R^2	0.089	0.081	0.092	0.113	0.117	0.158	0.131	0.121	0.129

$N = 49$; A, C, T, L and H denote perceived attractiveness, competence, trustworthiness, likeability and happiness. Standardised beta coefficients are presented in parentheses. (*), *, ** and *** denote significance at the 10, 5, 1 and 0.1 % level respectively

impact factors. At the bottom of the U-shaped curves the age varies between 40 and 57 years depending on the different models.

In all models except one a significantly (or at least weakly significantly) lower research performance in 2011/2012 can be observed for scholars who were retired before 2011, compared to the reference group (scholars who were appointed as professor before 2009 and who were not retired before the end of 2012). The significance level is 0.01 in three models, 0.05 in 12 models and 0.10 in two models. The two other control variables for the academic position are significant (or at least weakly significant) in 12 respectively 13 out of our 18 models. In all cases the algebraic signs of the regression coefficients are positive indicating a higher research performance for both scholars who have just been appointed as professor and scholars not appointed as professor yet.[5]

Tobit regression analyses show significant correlations between feelings of happiness and the research performance in the following years. However, it might also be possible that scholars' feelings of happiness are significantly correlated with their former research performance. For this reason we conducted Tobit regression analyses, using *feelings of happiness in 2010* as the dependant variable and the research performance in 2008/2009 as explanatory variable. Further explanatory variables are gender, age and age squared. In addition we controlled for the academic position distinguishing between four groups of scholars: (1) *not appointed as professor yet or before 2010*, (2) *appointed as professor in 2008/2009*, (3) *appointed as professor before 2008*, (4) *emeritus before 2010*. The reference group is formed by scholars who were appointed as professor before 2008 (group 3). In total we calculated 18 models (Appendix 4). They differ in respect of the considered dimension of physical appearance and in respect of the measure of research performance. None of the models reveals any significant relationship between the research performance in 2008/2009 and feelings of happiness in 2010. This indicates that feelings of happiness influence research performance but not vice versa.

Discussion

Happiness seems to significantly promote work-related success (see Diener et al. 2002; Graham et al. 2004). Our results might indicate that this also holds true for scholars in regard to their research performance, but they do not suggest the reverse causation. An explanation for this observation could be a positive relationship between happiness and creativity, as suggested by Pannells and Claxton (2008). It might be that happier scholars' generate more and/or better research ideas than their less happy colleagues. Conceivably, they are also more motivated to encourage their projects even though research performance does not seem to affect their feelings of happiness. In addition, Graham et al. (2004, p. 340) found "that residual happiness had positive effects on health". This might also explain why

[5] Tobit regressions without control variables for the academic position, which can be send on request, reveal a significant (or at least weakly significant) correlation between feelings of happiness in 2010 and research performance in 2011/2012 in 13 out of our 18 models. In nine of these models the variable feelings of happiness (2010) is significant on the level of 0.05; in 4 other models on the 0.10 level. Removing the control variables for the academic position does not change, and in many cases even increases the significance levels of the physical appearance scores. Without these control variables we can observe some more significant correlations between research performance and physical appearance scores, such as attractiveness when *Handelsblatt2012* is the dependent variable, competence when either *Handelsblatt2012* or *JQ2.1* is the dependent variable and the overall physical appearance score when *ref.Journal* is the dependent variable.

former feelings of happiness are significantly correlated with subsequent observable research performance of scholars. A further explanation might be, as suggested by Diener et al. (2002, p. 249), that individuals with "with attractive, upbeat personalities may receive more assistance from others in the workplace and so may be able to advance more quickly". Our results help to understand differences in regard to scholars' research performance. Nevertheless, they do not reveal if and how universities can enhance scholars' feelings of happiness in order to increase their research performance.

Moreover, our results show that scholars' physical appearance is significantly correlated with their research performance. However, the dimensions of physical appearance, which are correlated with the research performance, seem to differ from those dimensions of physical appearance affecting student evaluations of teaching (that is attractiveness, see Goebel and Cashen 1979; Hamermesh and Parker 2005; Riniolo et al. 2006; Felton et al. 2008; Rosar and Klein 2009), politicians' election success (attractiveness respectively competence, see Rosar et al. 2008 respectively Todorov et al. 2005) or CEOs' performance (competence respectively power-related traits, see Graham et al. 2010 respectively Rule and Ambady 2008). In our study, scholars' research performance is especially correlated with perceived trustworthiness while neither attractiveness nor perceived competence are significantly related to scholars' research performance. In research, trustworthiness is very important, since the possibilities to check the correctness of methodical procedure and reported results are limited. For this reason, it does not seem surprising that the perceived trustworthiness is the relevant variable in our study. Even in the case of only considering articles in journals applying a peer-review process, perceived trustworthiness has a significant influence.

The correlation between perceived trustworthiness and research performance might indicate that even in the field of research people use the physical appearance to make assumptions about a person's expertise. Appearing trustworthy might influence editors' decision as well as reviewers' judgement, in case they know the author's name respectively are aware of his/her physical appearance. Nevertheless, our results do not allow us to determine the causality of these relationships. The same holds true for observed significant correlations between feelings of happiness and subsequent observable research performance. However it cannot be excluded that our results are rather explained by differences in quality with regard to submitted manuscripts than by discrimination. This could be the case for two reasons: First, scholars, who are perceived to be very trustworthy, might receive more suggestions for improvements from peers for example on presentations at conferences or on submitted manuscripts. Both increase the quality of submitted manuscripts and thus the probability that a paper will be published in any academic journal respectively in an academic journal featuring a high impact factor. This consideration is derived from Diener et al. (2002), who suggest that personal traits might increase support in the work environment. Second, as our results show that perceived happiness is weakly significantly correlated with reported happiness, perceived trustworthiness might be correlated with characteristics which positively influence the quality of manuscripts. Finally, we do not know whether and how perceived trustworthiness is correlated with real trustworthiness. Assuming there is a relationship it might be similar to the one suggested by Kanazawa and Kovar (2004). These authors present evidence for four assumptions from which follows that beautiful people are indeed more intelligent. According to Kanazawa and Kovar (2004, p. 227) the following applies: "(1) Men who are more intelligent are more likely to attain higher status than men who are less intelligent. (2) Higher-status men are more likeable to mate with more beautiful woman than lower-status men. (3) Intelligence is heritable. (4) Beauty is heritable."

The two explanatory approaches (discrimination vs. productivity differentials) for relationships between physical appearance and work-related success—in this case the increased research performance—are not mutually exclusive. However, as in most other studies our data do not allow us to determine to which extend differences related to the physical appearance reflect discrimination. In respect to the results reported by Landy and Sigall (1974) and King and Leigh (2009) it seems not unlikely that our results provide evidence that even in the field of research people use the physical appearance to make assumptions about a person's expertise. Landy and Sigall (1974) showed in an experiment with students that the evaluations of essays, which were reviewed several times, were influenced by attached photos (photos of attractive students vs. photos of unattractive students). They also reported, that their results indicate that attractiveness has a stronger influence on the evaluation of poor quality work. Landy and Sigall (1974, p. 302) state that "[one] possible implication is that if someone's work is competent, personal characteristics are less subject to influence evaluations of that work than when the quality of the work is relatively poor". Indeed it should be noted that in the study of Landy and Sigall (1974, p. 304) solely male students evaluated essays written by "female stimulus persons". In addition, the results of King and Leigh (2009) indicate that politicians physical appearance had a stronger influence on the vote decision of apathy electorates, who were according to Australian law forced to vote, than on the vote decision of engaged electorates. However, the difference between the two sets of electorates is only in one of their panels statistically significant. For that reason King and Leigh (2009, pp. 589–591) also state that their discrimination-hypothesis is "more suggestive than conclusive".

Conclusion

The results of our study reveal significant correlations between scholars' feelings of happiness and their subsequent observable research performance. Conversely, we cannot observe significant relationships between previous research performance and subsequent reported feelings of happiness. In contrast to previous studies on the relevance of scholars' physical appearance for work-related success our study focuses on scholars' research performance instead of their student evaluations of teaching. Even though at first glance one would not expect that physical appearance is relevant for research output we find significant relationships. However, while scholars' evaluations of teaching are influenced by attractiveness, their research performance is not significantly correlated with attractiveness but with (perceived) trustworthiness. Our results help to understand differences in regard to scholars' research performance. Nevertheless, they do not reveal whether and how universities can enhance scholars' feelings of happiness in order to increase their research performance. However, our results do not allow us to determine the causality of observed significant relationships. In addition, our dataset is limited to the number of 49 scholars acting in a specific field of research. Therefore further studies are worthwhile to validate observed correlations using a larger dataset and considering scholars acting in different fields of research. Such studies might also analyse research performance, physical appearance and feelings of happiness at different points of time.

Acknowledgments The authors are very grateful to the participants of our study at the 72nd annual conference of the German Academic Association for Business Research (VHB) in Bremen 2010 and to Johanna Metker for taking photos of them. We also thank the participants of the annual meeting of the Section of Academic Management of the VHB in Duisburg 2013 as well as the participants of the 2013 EAIR Rotterdam Forum and two anonymous reviewers for valuable suggestions.

Appendix 1

See Table 4.

Table 4 OLS regressions using physical appearance scores as dependent variables

Dependent variable	Model 1 Attractiveness	Model 2 Competence	Model 3 Trustworthiness	Model 4 Likeability	Model 5 Happiness
Explanatory variables					
Proportion of female raters	1.581 [0.049]	0.898 [0.036]	0.105 [0.004]	2.014 [0.068]	3.736 [0.141]
Scholars' age	−0.025(*) [−0.245]	0.018 [0.224]	0.022* [0.279]	0.015 [0.153]	0.016 [0.190]
Scholars' gender (male = 1)	−0.447 [−0.189]	0.278 [0.152]	−0.559* [−0.305]	−0.607(*) [−0.276]	−0.156 [−0.080]
Constant	4.958	5.640*	6.324*	5.166	4.083
Adjusted R^2	0.045	0.021	0.106	0.029	−0.013

$N = 51$; (*) and * denote significance at the 10 and 5 % level respectively. Standardised beta coefficients are presented in parentheses

Appendix 2

See Table 5.

Table 5 Female versus male scholars

	Mean		Significance (Mann–Whitney-*U*-Test)
	Women ($N = 14$)	Men ($N = 35$)	
Age (2010)	40	41	
Feelings of happiness (2010)	7.64	7.77	
Physical appearance (2010)			
Attractiveness	5.09	4.61	
Competence	6.99	7.27	
Trustworthiness	7.28	6.72	*
Likeability	7.18	6.59	*
Happiness	7.39	7.30	
Overall	0.24	−0.12	
Research performance 2011/2012			
Handelsblatt2012	0.23	0.38	
JQ2.1	1.86	3.36	(*)
ref.Journal	0.74	1.16	

(*) and * denote significance at the 10 and 5 % level respectively

Appendix 3

See Table 6.

Table 6 Correlation analyses for relations between gender, age, feelings of happiness, physical appearance and research performance

	Feelings of happiness (2010)	Physical appearance (2010)						Research performance 2011/2012		
		Attractiveness	Competence	Trustworthiness	Likeability	Happiness	Overall	Handelsblatt2012	JQ2.1	ref.Journal
Gender (male)	0.03	−0.20	0.16	−0.31*	−0.27(*)	−0.04	−0.17	0.18	0.24(*)	0.18
Age (2010)	0.38**	−0.29*	0.20	0.27(*)	0.12	0.16	0.13	−0.03	−0.04	−0.04
Feelings of happiness (2010)		−0.09	0.08	0.15	0.21	0.27(*)	0.17	0.23	0.19	0.27(*)
Physical appearance (2010)										
Attractiveness			0.51***	0.38***	0.59***	0.45***	0.68***	0.30*	0.24(*)	0.15
Competence				0.65***	0.53***	0.44***	0.74***	0.27(*)	0.33*	0.18
Trustworthiness					0.83***	0.60***	0.86***	0.33*	0.31*	0.25(*)
Likeability						0.86***	0.95***	0.35*	0.26(*)	0.24(*)
Happiness							0.84***	0.33*	0.22	0.23
Overall								0.38**	0.33*	0.26(*)
Research performance 2011/2012										
Handelsblatt2012									0.92***	0.89***
JQ2.1										0.90***
ref.Journal										

$N = 49$ (14 women and 35 men); (*), *, ** and *** denote significance at the 10, 5, 1 and 0.1 % level respectively

Appendix 4

See Table 7.

Table 7 Tobit regressions for feelings of happiness in 2010 considering research performance in 2008/2009

	Research performance in 2008/2009 = Handelsblatt2012						Research performance in 2008/2009 = JQ2.1		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3
Gender (male)	−0.145	−0.226	−0.106	0.176	0.042	0.029	−0.110	−0.207	−0.062
Age (2010)	0.387	0.350	0.373	0.429	0.517(*)	0.440	0.384	0.346	0.369
Age^2 (2010)	−0.004	−0.003	−0.003	−0.004	−0.005(*)	−0.004	−0.003	−0.003	−0.003
Academic position									
Not appointed as professor yet or before 2010	−0.130	−0.115	−0.027	0.168	0.397	0.114	−0.152	−0.128	−0.040
Appointed as professor in 2008/2009	0.436	0.558	0.504	0.433	0.566	0.400	0.471	0.599	0.552
Emeritus before 2010	13.802	13.515	13.748	14.198	14.322	14.312	13.727	13.441	13.659
Research performance in 2008/2009	0.062	0.156	0.114	−0.170	−0.361	−0.104	−0.015	−0.004	−0.013
Physical Appearance (2010)	A	C	T	L	H	Overall	A	C	T
	0.139	−0.004	0.138	0.445	0.707*	0.369	0.151	0.007	0.154
Constant	−2.291	−0.767	−2.302	−5.781	−9.827	−2.858	−2.252	−0.721	−0.291
Pseudo R^2	0.064	0.063	0.063	0.073	0.085	0.069	0.064	0.063	0.063

	Research performance in 2008/2009 = JQ2.1			Research performance in 2008/2009 = ref.Journal					
	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Gender	0.264	0.123	0.111	−0.145	−0.226	−0.103	0.199	0.082	0.044
Age (2010)	0.425	0.514(*)	0.438	0.386	0.347	0.371	0.434	0.530*	0.444
Age^2 (2010)	−0.004	−0.005(*)	−0.004	−0.004	−0.003	−0.003	−0.004	−0.005(*)	−0.004
Academic position									
Not appointed as professor yet or before 2010	0.143	0.369	0.093	−0.132	−0.120	−0.031	0.172	0.412	0.116

Table 7 continued

	Research performance in 2008/2009 = JQ2.1			Research performance in 2008/2009 = ref.Journal					
	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Appointed as professor in 2008/2009	0.486	0.614	0.449	0.439	0.571	0.516	0.443	0.587	0.407
Emeritus before 2010	14.096	14.254	14.231	13.793	13.479	13.720	14.210	14.377	14.320
Research performance in 2008/2009	−0.052	−0.068	−0.046	0.017	0.041	0.025	−0.090	−0.187	−0.059
Physical Appearance (2010)	L	H	Overall	A	C	T	L	H	Overall
	0.473	0.732*	0.400	0.141	−0.003	0.140	0.453	0.730*	0.374
Constant	−5.837	−9.901	−2.774	−2.278	−0.698	−2.262	−5.913	−10.225	−2.910
Adjusted R^2	0.074	0.086	0.070	0.064	0.063	0.063	0.073	0.085	0.069

$N = 49$; A, C, T, L and H denote perceived attractiveness, competence, trustworthiness, likeability and happiness. Standardised beta coefficients are presented in parentheses.
(*) and * denote significance at the 10 and 5 % level respectively

References

Bauer, H. P. W., Schui, G., von Eye, A., & Krampen, G. (2013). How does scientific success relate to individual and organizational characteristics? A scientometric study of psychology researchers in the German-speaking countries. *Scientometrics, 94*(2), 523–539.

Biddle, J. E., & Hamermesh, D. S. (1998). Beauty, productivity, and discrimination: Lawyers' look and lucre. *Journal of Labour Economics, 16*(1), 172–201.

Boehm, J. K., & Lyubomirsky, S. (2008). Does happiness promote career success? *Journal of Career Assessment, 16*(1), 101–116.

Bosquet, C., & Combes, P. (2013). Are academics who publish more also more cited? Individual determinants of publication and citation records. *Scientometrics, 97*(3), 831–857.

Diener, E., Nickerson, C., Lucas, R. E., & Sandvik, E. (2002). Dispositional affect and job outcomes. *Social Indicators Research, 59*(3), 229–259.

Dilger, A., & Müller, H. (2012). Ein Forschungsleistungsranking auf der Grundlage von Google Scholar. *Zeitschrift für Betriebswirtschaft (ZfB), 82*(10), 1089–1105.

Dziuban, C. D., & Shirkey, E. C. (1974). When is a correlation matrix appropriate for factor analysis? Some decision rules. *Psychological Bulletin, 81*(6), 358–361.

Felton, J., Koper, P. T., Mitchell, J., & Stinson, M. (2008). Attractiveness, easiness and other issues: Student evaluations of professors on Ratemyprofessors.com. *Assessment and Evaluation in Higher Education, 33*(1), 45–61.

Fukuzawa, N. (2014). An empirical analysis of the relationship between individual characteristics and research productivity. *Scientometrics, 99*(3), 785–809.

Goebel, B. L., & Cashen, V. M. (1979). Age, Sex, and Attractiveness as Factors in Student Ratings of Teachers: A developmental study. *Journal of Educational Psychology, 71*(5), 646–653.

Gonzalez-Brambila, C., & Veloso, F. M. (2007). The determinants of research output and impact: A study of mexican researchers. *Research Policy, 36*(7), 1035–1051.

Graham, C., Eggers, A., & Sukhtankar, S. (2004). Does happiness pay? An exploration based on panel data from Russia. *Journal of Economic Behavior & Organization, 55*(3), 319–342.

Graham, J. R., Harvey, C. R., & Puri, M. (2010). A corporate beauty contest. Discussion Paper, online at http://ssrn.com/abstract=1571469. Last request on October 1, 2014.

Hamermesh, D. S., & Biddle, J. E. (1994). Beauty and the labor market. *American Economic Review, 84*(5), 1174–1194.

Hamermesh, D. S., & Parker, A. (2005). Beauty in the classroom: Instructors' pulchritude and putative pedagogical productivity. *Economics of Education Review, 24*(4), 369–376.

Harris, G., & Kaine, G. (1994). The determinants of research performance: A study of Australian university economists. *Higher Education, 27*(2), 191–201.

Hedjazi, Y., & Behravan, J. (2011). Study of factors influencing research productivity of agriculture faculty members in Iran. *Higher Education, 62*(5), 635–647.

Hom, H. L., & Arbuckle, B. (1988). Mood induction effects upon goal setting and performance in young children. *Motivation and Emotion, 12*(2), 113–122.

Kaiser, H. F., & Rice, J. (1974). Little Jiffy, Mark Iv. *Educational and Psychological Measurement, 34*(1), 111–117.

Kanazawa, S., & Kovar, J. L. (2004). Why beautiful people are more intelligent. *Intelligence, 32*(3), 227–243.

King, A., & Leigh, A. (2009). Beautiful politicians. *Kyklos, 62*(4), 579–593.

Klein, M., & Rosar, U. (2005). Physische Attraktivität und Wahlerfolg: Eine empirische Analyse am Beispiel der Wahlkreiskandidaten bei der Bundestagswahl 2002. *Politische Vierteljahresschrift, 46*(2), 263–287.

Landy, D., & Sigall, H. (1974). Beauty is talent: Task evaluation as a function of the performer's physical attractiveness. *Journal of Personality and Social Psychology, 29*(3), 299–304.

Lyubomirsky, S., & King, L. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*(6), 803–855.

Mobius, M. M., & Rosenblat, T. S. (2006). Why beauty matters. *American Economic Review, 96*(1), 222–235.

Pannells, T. C., & Claxton, A. F. (2008). Happiness, creative ideation, and locus of control. *Creativity Research Journal, 20*(19), 67–71.

Patzer, G. L. (1983). Source credibility as a function of communicator physical attractiveness. *Journal of Business Research, 11*(2), 229–241.

Postma, E. (2014). A relationship between attractiveness and performance in professional cyclists. *Biology Letters, 10*(2). doi:10.1098/rsbl.2013.0966.

Puuska, H. (2010). Effects of scholar's gender and professional position on publishing productivity in different publication types: Analysis of a Finnish university. *Scientometrics, 82*(2), 419–437.
Ramsden, P. (1994). Describing and explaining research productivity. *Higher Education, 28*(2), 207–226.
Riniolo, T. C., Johnson, K. C., Sherman, T. S., & Misso, J. A. (2006). Hot or not: Do professors perceived as physically attractive receive higher student evaluations? *Journal of General Psychology, 133*(1), 19–35.
Rosar, U., & Klein, M. (2009). Mein (schöner) Prof.de: Die physische Attraktivität des akademischen Lehrpersonals und ihr Einfluss auf die Ergebnisse studentischer Lehrevaluationen. *Kölner Zeitschrift für Soziologie und Sozialpsychologie, 61*(4), 621–645.
Rosar, U., Klein, M., & Beckers, T. (2008). The frog pond beauty contest: Physical attractiveness and electoral success of the constituency candidates at the north rhine-westphalia state election of 2005. *European Journal of Political Research, 47*(1), 64–79.
Rule, N. O., & Ambady, N. (2008). The face of success: Inferences from chief executive officers' appearance predict company profits. *Psychological Science, 19*(2), 109–111.
Schläpfer, J., Storbeck, O. (2012). BWL-Ranking 2012: Methodik und Zeitschriftenliste. *Handelsblatt* 15.06.2012. online at http://www.handelsblatt.com/politik/oekonomie/bwl-ranking/bwl-ranking-2012-bwl-ranking-2012-methodik-und-zeitschriftenliste/6758368.html. Last request on October 1, 2014.
Todorov, A., Mandisodza, A. N., Goren, A., & Hall, C. C. (2005). Inferences of competence from faces predict election outcomes. *Science, 308*(5728), 1623–1626.
Torgler, B., Antić, N., & Dulleck, U. (2008). Mirror, mirror on the wall, who is the happiest of them all? *Kyklos, 61*(2), 309–319.
Woods, C. (2012). Exploring emotion in the higher education workplace: Capturing contrasting perspectives using Q methodology. *Higher Education, 64*(6), 891–909.