



## Brief Reports

## Physical attractiveness and the general factor of personality: Replication and extension

Curtis S. Dunkel<sup>c,\*</sup>, Dimitri van der Linden<sup>a</sup>, Satoshi Kanazawa<sup>b</sup><sup>a</sup> Department of Psychology, Education, and Child studies, Erasmus University Rotterdam, the Netherlands<sup>b</sup> Department of Management, London School of Economics and Political Science, United Kingdom<sup>c</sup> Fontana, Wisconsin USA 53125

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## ABSTRACT

A significant positive correlation between physical attractiveness and the general factor of personality (GFP) has been found. This association was replicated in the current study with longitudinal analyses revealing that physical attractiveness in both childhood and adolescence is predictive of the GFP in adulthood. It is posited that the results are due to mediated pleiotropy with attractive individuals responding positively to preferential treatment. The results may extend our understanding of the development of individual differences in the GFP. However, future research in which both attractiveness and personality are measured at several points is needed to disentangle the dynamics effects between the two variables.

## 1. Introduction

It is well established that self-report personality scales, even when designed to measure theoretically orthogonal traits, often yield a positive manifold reflecting the extent to which each trait is socially valued (e.g., Hofstee, 2003). Several scholars view such associations between traits as a nuisance, for example, as measurement error that is inherent in self-reports (e.g., Ashton et al., 2009; Edwards, 1957; Bäckström et al., 2009). However, this opinion among personality researchers is not unanimous. Others have argued that the intercorrelations are caused by an important or even the central component of personality (Webb, 1915; Block, 1995; Musek, 2017). Contemporarily, this primary factor is thought to signify the degree to which individuals are socially effective (e.g., Van der Linden et al., 2022) or, more broadly, emotionally intelligent (Van der Linden et al., 2017). A valuable method for testing these competing claims is to correlate the factor extracted from this positive manifold (now referred to as the general factor of personality or GFP) with objective (i.e., not self-report) criteria. If the GFP correlates significantly and meaningfully with “real-world” criteria it suggests that it is substantive. The current investigation is an attempt to replicate, and extend, previous findings using this method by correlating the GFP with physical attractiveness.

Using a large representative sample of young adults from the U.S., Dunkel et al. (2017) found that both self-reported and, more importantly, rater-based assessments of physical attractiveness showed small but relevant positive associations with the GFP ( $r = 0.13$  for rater-based and  $r = 0.14$  for self-report). Additionally, the association between personality and rater-based physical attractiveness was primarily a function of the GFP. In contrast, the association between personality and self-rated attractiveness was equally accounted for by the GFP and lower-order traits. Lastly, genetic analyses showed that the rater-based physical attractiveness/GFP association was solely due to additive genetic factors while non-shared environment explained most of the self-report physical attractiveness/GFP covariation. The results for the rater-based assessment of physical attractiveness are especially intriguing as they suggest that physical attractiveness may be an objective marker<sup>2</sup> of a high GFP.

The current study is an attempt to test the replicability of the association between rater-based physical attractiveness and the GFP. As in Dunkel et al. (2017), personality was measured using self-report scales and physical attractiveness was conceptualized as the attractiveness ratings of independent judges. Whereas a twin design was used in Dunkel et al. (2017), in the present study we test this possibility using two longitudinal data sets. We posit that physical attractiveness may be

\* Corresponding author.

E-mail address: [curtdunkel@protonmail.com](mailto:curtdunkel@protonmail.com) (C.S. Dunkel).<sup>1</sup> Independent researcher<sup>2</sup> Objective in the sense that physical attractiveness is rated by several independent raters as opposed to an individual's self-assessment.

an early developmental indicator of the GFP later in life. This hypothesis is tested using assessments of physical attractiveness in childhood in one study and adolescence in the other study to predict personality in early or middle adulthood. To further substantiate the importance of the GFP we test whether any potential effect is also primarily at the level of the GFP or lower order personality traits.

## 2. Method

### 2.1. Sample 1: Wisconsin longitudinal study

#### 2.1.1. Participants

The Wisconsin Longitudinal Study (WLS) is a longitudinal study that began in 1957 with a random sample of 10,317 Wisconsin high school students ( $M$  age = 18.16;  $SD$  = 0.51). The personality or outcome measures were completed by 6248 participants (3328 female and 2920 male) in early adulthood. The sample is overwhelmingly White, (Herd et al., 2014; Sewell et al., 2003), reflecting the state demographics at the initiation of the study. Information about how to access the data can be found at <https://wls.wisc.edu/>. Study administrators maintain that the privacy rights of subjects have been observed and informed consent obtained. The present study did not require IRB approval because it used publicly available de-identified data.

#### 2.1.2. Measures

**2.1.2.1. Physical attractiveness.** Physical attractiveness was assessed using participant's photos from their 1957 high school yearbook. Photos were rated in years 2004 and 2008 by six men and six women using a Likert-type scale from 1 (not at all attractive) to 11 (extremely attractive). The measure of physical attractiveness is the average of the scores across raters and the reliability of the measure is estimated at  $\alpha = 0.87$  (Hauser & Weir, 2010).

**2.1.2.2. Personality.** Personality was measured twice in the years 1992–1993 when participants were in their mid-30's. Measures of the Big Five personality traits were administered each by a 10-item phone interview and a 29-item self-administered mail-in questionnaire. To increase the reliability of the scales and reduce idiosyncratic measurement error (see <https://ssc.wisc.edu/wlsresearch/documentation/appendices/G/memo091.asc>) the scales were combined.

Because different rating scales were used to record the participant's responses, the Big Five trait scores for the mail-in survey and phone interview were transformed to  $z$ -scores prior to being summed. The composite scores were then factor analyzed using principal axis factoring (PAF). The resulting first factor or GFP explained 23.49% of the variance and had an Eigenvalue of 1.17. The factor loadings for the trait scales were as follows: Openness = 0.58; Conscientiousness = 0.41; Extraversion = 0.38; Agreeableness = 0.46; Neuroticism = -0.56.

### 2.2. Sample 2: National child development study

#### 2.2.1. Participants

The National Child Development Study (NCDS) is a longitudinal study which began in 1958. Every child born within one week in Great Britain was enrolled in the study totaling a sample size of 17,419. The personality measure was completed by 6789 participants (3578 male and 3211 female) in middle adulthood. Virtually all the participants were White. Registration to download the data can be found by following the links at <https://ncds.info/>. Study administrators maintain that the privacy rights of subjects have been observed and informed consent obtained. Early waves of data collection predated the establishment of ethics committees. The present study did not require IRB approval because it used publicly available de-identified data.

### 2.2.2. Measures

**2.2.2.1. Physical attractiveness.** Physical attractiveness was rated by the participant's teachers at ages seven and 11. Teachers rated the participants using the blunt ratings of "attractive", "unattractive or not attractive", "scruffy or slovenly & dirty", "looks underfed/undernourished", and "abnormal feature". The resulting classification was heavily skewed toward the attractive rating. Thus, similarly to Kanazawa (2011) participants were classified as attractive if teachers rated them attractive at both ages, otherwise they were classified as unattractive. Unattractive was dummy-coded as "1" and attractive was dummy-coded as "2".

**2.2.2.2. Personality.** The 50-item International Personality Item Pool measure (Goldberg, 1999) of the Big Five personality traits was administered to participants at ages 50–51. The GFP was extracted from the factor analysis, using PAF, which had an Eigenvalue of 1.22 and accounted for 24.31% of the variance with the following factor loadings: Intellect = 0.56, Conscientiousness = 0.37, Extraversion = 0.64, Agreeableness = 0.54, and Emotional Stability = 0.26.

## 3. Results

The bivariate correlations between physical attractiveness, the individual Big Five traits, and GFP can be seen in Table 1. Due to the large sample size, rejection of the null hypothesis was set at  $p < .001$ . In the WLS physical attractiveness was positively correlated with the Big Five traits of openness and extraversion. Consistent with the hypotheses, physical attractiveness was positively correlated to the GFP. In the NCDS physical attractiveness was positively correlated with intellect, conscientiousness, agreeableness and the GFP.

To examine the strength of the associations between physical attractiveness and the unique variance of the individual Big Five traits, partial correlations between variables while controlling for the GFP were calculated. In the WLS, when controlling for the GFP, physical attractiveness remained only positively correlated to openness. In the NCDS, only conscientiousness remained correlated with physical attractiveness when controlling for the GFP. Additionally, the association between extraversion and physical attractiveness turned negative. In sum the results are consistent with the proposition that the association of physical attractiveness with personality is largely at the level of the GFP.

## 4. Discussion

The purpose of the present research was to test the replicability of the positive correlation between physical attractiveness and the GFP using data from two large longitudinal studies. Consistent with previous findings, a small (yet consistent), positive correlation between the two variables was found in each study. In the WLS, physical attractiveness in

**Table 1**

Bivariate and Partial Correlations (Controlling for the GFP) between Physical Attractiveness and Personality.

	Physical Attractiveness (WLS)	Physical Attractiveness (NCDS)
Openness/Intellect	0.11*/06*	0.08*/0.01
Conscientiousness	0.02/-0.03	0.12*/0.09*
Extraversion	0.07*/0.02	0.04/-0.08*
Agreeableness	0.03/-0.03	0.07*/-0.00
Neuroticism/Emotional Stability	-0.04/0.03	0.06/0.03
GFP	0.11*	0.10*

*Note.* Bivariate correlations are to the left of the slash and partial correlations are to the right of the slash. WLS = Wisconsin Longitudinal Study; NCDS = National Child Development Study.

\*  $p < .001$ .

late adolescence was predictive of the GFP in early/middle adulthood. In the NCDS, physical attractiveness in childhood was predictive of the GFP in middle adulthood. Moreover, partial analyses showed that the association between physical attractiveness and personality is mostly at the level of the general factor. Exceptions to this trend were the association between openness and physical attractiveness in the WLS and conscientiousness and physical attractiveness in the NCDS. The association between extraversion and physical attractiveness in the NCDS actually turned negative when controlling for the GFP.

The atheoretical nature of the findings is a limitation and a clear objective for future research. Dunkel et al. (2017) speculated that the physical attractiveness and GFP association was due to mutation load. However, they found the association was explained by additive genetic factors while mutation load would be reflected by a significant non-additive genetic effect (e.g., Zietsch, 2024). A subsequent check of the presence of non-additive effects, which were not tested for in the original article, yielded a null result.<sup>3</sup> Thus the results suggest some pleiotropic genetic effect in which both molar personality (i.e., the GFP) and physical attractiveness are linked. One could imagine, for example, mediated pleiotropy via an evocative gene-environment correlation due to halo effects in which physically attractive individuals develop a more effective personality due to the favorable impression, expectations (e.g., Batres & Shiramizu, 2023), and possible treatment (Dossinger et al., 2019) they receive from others due to their attractiveness.

The measures of physical attractiveness may also be a limitation. While physical attractiveness in the WLS was derived from ratings of several judges, the ratings were based on a single static black-and-white yearbook photograph. In the NCDS only two teachers rated the target child and the rating scale seemed awkward as evidenced by the skewed ratings. Future research should address these deficiencies in the assessment of physical attractiveness. Reduction in measurement error should lead to a more accurate gauge of the association between physical attractiveness and personality. Whereas the longitudinal results from physical attractiveness to the GFP are consistent with this possibility having measures of both physical attractiveness and personality at multiple points in time may help to tease apart the dynamic interplay between the two variables.

#### CRedit authorship contribution statement

**Curtis S. Dunkel:** Writing – original draft, Formal analysis, Conceptualization. **Dimitri van der Linden:** Writing – review & editing, Conceptualization. **Satoshi Kanazawa:** Writing – review & editing, Conceptualization.

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#### Declaration of competing interest

We have nothing to declare.

#### Data availability

Wisconsin Longitudinal Study: <https://wls.wisc.edu/>  
National Child Development Study: <https://ncds.info/>

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<sup>3</sup> Rater-based physical attractiveness and GFP: MZ correlation ( $r = 0.19$ ), DZ correlation ( $r = 0.16$ ). Results supplied by J. Nedelec (personal communication, June 29th, 2025).