Personality and Individual Differences 50 (2011) 723–728

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Who wants to take an intelligence test? Personality and achievement motivation in the context of ability testing ☆

Philipp Alexander Freund [a,*], Heinz Holling [b]

[a] Leuphana Universität Lüneburg, Scharnhorststraße 1, 21335 Lüneburg, Germany
[b] Westfälische Wilhelms-Universität Münster, Fliednerstraße 21, 48149 Münster, Germany

ARTICLE INFO

Article history:
Received 17 July 2010
Received in revised form 16 December 2010
Accepted 20 December 2010

Keywords:
Personality
BIG 5
Achievement motivation
Intelligence test

ABSTRACT

This article examines the role of the BIG 5 and general mental ability (GMA) for the prediction of current achievement motivation (CAM) in an ability testing context. A total of 189 participants took two figural matrices tests, and 90 of them received a training intervention between tests. Separate analyses for both tests showed openness, conscientiousness, and neuroticism to significantly predict CAM. Also, more intelligent persons were more interested and more confident. Training had an additional impact on probability of success. CAM in turn significantly predicted matrices test performance and test times beyond GMA. The results show that the BIG 5 can be used to understand what kind of persons are really motivated in experimental testing situations, and how strongly test performance is tied not only to GMA, but also to CAM.

1. Introduction

For most complex tasks in professional and non-professional domains, ability and achievement motivation are prerequisites for high performance (e.g., Steinmayr & Spinath, 2008). In fact, one will usually not suffice without the other. However, if an individual has a high degree of achievement motivation, he or she does not have to behave accordingly in all possible performance situations because the task characteristics met in the specific situation play an important role (Rheinberg, Vollmeyer, & Burns, 2001). Current achievement motivation (CAM) therefore is defined as the product of a (relatively) stable achievement motive on the person side and situational task characteristics (Atkinson, 1957; Lewin, 1946). If person and task characteristics show a good fit, the resulting CAM should influence task-related behavior. This relationship is not necessarily non-compensatory. As an example, if a person has a high internal achievement motivation, and the task acts as a trigger, CAM will be high, and the subsequent behavior will be in accordance. If internal achievement motivation is high, but the task is not appealing (because it is ill-structured, perceived as unfair, boring, etc.), maximum performance is possible, but not definite. The same is true if internal motivation is not high, but the task is appealing (because it is important, offers a high reward, etc.). Finally, if both internal motivation and task appeal are missing, CAM will be severely impaired. CAM is therefore not considered a trait, but rather a state.

Being able to successfully identify persons who like to engage in high levels of CAM is of interest in professional as well as in academic contexts. Studies on the validity of test scores obtained from personality questionnaires have shown these scores to be useful predictors of job performance. Accordingly, there should be substantial relationships between personality and achievement motivation. Judge and Ilies (2002) conducted a meta-analysis on the relationship of personality (the BIG 5) to performance motivation, which they split into three facets: Goal-setting motivation (measures of the goal level), expectancy motivation (perception whether working on an activity would result in attaining specific outcomes), and self-efficacy motivation (self-estimates of ability). The results showed openness to be a positive predictor for goal-setting and self-efficacy motivation, but not for expectancy motivation. Conscientiousness was a positive predictor for all motivation facets (for expectancy at $p < .10$), while neuroticism was a negative predictor in all cases. Furthermore, extraversion was a positive predictor of goal-setting and self-efficacy motivation as well, but not for expectancy motivation. Agreeableness was only a negative predictor of goal-setting motivation.

While the meta-analytic results of Judge and Ilies (2002) give a good understanding of the personality-motivation interface, they can be extended in meaningful ways. A first extension concerns the kind of motivational construct used. Judge and Ilies themselves note that more proximal measures of motivation, such as anticipated effort, persistence, or self-regulation (beyond self-efficacy), should be analyzed (Judge & Ilies, 2002, p. 804). These proximal

☆ The authors thank the editor and two anonymous reviewers for their helpful comments.

* Corresponding author. Tel.: +49 4131 677 1589.
E-mail address: afreund@leuphana.de (P.A. Freund).

0191-8869/$ - see front matter © 2010 Elsevier Ltd. All rights reserved.
doi:10.1016/j.paid.2010.12.025

measures are more directly related to the task and less general than the motivational measures used in their meta-analysis. They are also more state - than trait-related. CAM was introduced by Rheinberg et al. (2001) as a more proximal measure of performance motivation that is consequently operationalized differently from the more distal facets analyzed in Judge and Ilies (2002). It entails the following four dimensions: Interest in the task, probability of success, self-perceived challenge, and anxiety/fear of failure. These four dimensions result from the interaction of a person's underlying motives and the situational stimulus. As such, they can only be assessed after a detailed introduction to the task. This is a vital aspect that restricts the application of CAM to situations where the cognitive demands and requirements can be made clear beforehand. CAM therefore is related, but not equal, to the three facets of performance motivation investigated in Judge and Ilies (2002). In our study, we make use of CAM in an ability (abstract reasoning) testing situation. This requires the use of a rationally constructed ability test, which can be explained in full detail to all test takers (Freund, Hofer, & Holling, 2008; see also Section 2).

Analyzing the temporal stability of the relationship between personality and motivation would be another extension to Judge and Ilies (2002). Also, person factors such as general mental ability, or gender, may influence motivation.

1.1. Aims of this study

We aim to analyze the relationship between personality variables and CAM in an experimental achievement situation, in this case, taking an intelligence test. We do this by analyzing the impact of the BIG 5 and general mental ability (GMA) on the four dimensions of CAM. A special feature of our study is that we investigate this link in a retest setting. This allows us to analyze (a) the temporal stability of the relationships and (b) whether test experience has an influence on the sizes of the effects. Also, we administer a task-specific training program to a proportion of our participants. Training for cognitive tasks is commonplace in the preparation for standardized entry level tests, like the SAT Reasoning Test, for instance (e.g., Anastasi, 1981). Its main anticipated outcomes are a reduction of test anxiety, an increase in confidence, and better test performance.

1.2. Hypotheses

We specify the following hypotheses: When taking an intelligence test for the first time, and after receiving a detailed explanation of the task type, openness is a predictor of interest and probability of success. This is because persons high on openness will be positively stimulated by the new experience, and confident that they can be successful in the task ahead. We expect conscientiousness to predict challenge, interest, and probability of success. The task type is explained in detail, making it obvious that the careful and repeated analysis and application of certain rules and principles is required in order to solve the items (see Section 2). Also, the prospect of having to work on a number of such items may deter persons with low conscientiousness because they could anticipate monotony after a while. We expect neuroticism to predict anxiety because neurotic persons should be afraid of the concrete achievement requirements. We also expect extraversion to predict probability of success. Extraverted individuals can be assumed to be confident in achievement situations, as this helps them to retain a positive emotionality (Judge & Ilies, 2002). We do not formulate hypotheses with respect to agreeableness because theoretically, agreeableness is primarily associated with social behavior, and less with (personal) achievement situations.

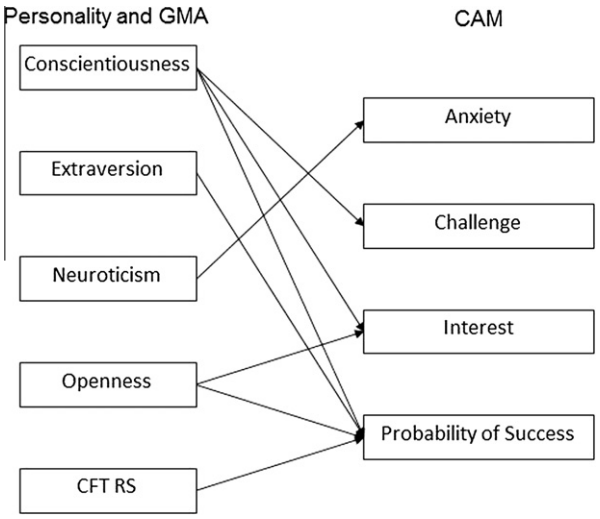

Fig. 1. Overview over hypotheses on BIG 5, GMA, and dimensions of CAM.

GMA is assumed to be positively related to probability of success. These hypotheses are summarized graphically in Fig. 1.

At the retest, all participants are able to use the experience they made with the initial test. We assume this experience to strengthen the relationships between the BIG 5 and CAM. Furthermore, we expect the administration of training to significantly increase probability of success, and reduce anxiety. This is because training is supposed to make test takers feel more confident by giving feedback on performance, etc. Finally, we expect the CAM dimensions to be significant predictors of performance-related measures beyond GMA (Steinmayr & Spinath, 2008). Here, we use accuracy and test time as outcome criteria.

2. Method

2.1. Participants

One hundred and eighty nine German undergraduate university and high school students participated in this study. Ninety participants were included in the training group, and 99 participants were included in the control group. Participants could not be forced to take part in daily training sessions, and therefore assignment to the groups could not be carried out in a complete random fashion, but the groups did not differ on any relevant sample characteristics (see below). The training group consisted of 72 females and 18 males. Their age ranged from 15.58 to 34.67 years, with a mean of 21.82 and a standard deviation of 3.27. In the control group, there were 74 females and 25 males, their age ranging from 17.08 to 48.50 years, with a mean of 22.99 and a standard deviation of 4.62. This difference in age was significant ($p < .05$), but irrelevant to the hypotheses of the current study.

2.2. Materials

2.2.1. BIG 5 questionnaire

For the assessment of the BIG 5, the German version of the NEO-Five-Factor-Inventory (Borkenau & Ostendorf, 1993) was used. Items were answered on 5-point rating scales (scored from 0 to 4). Means (average scores across all items) and standard deviations of the scores, as well as internal consistencies, are reported in Table 1. None of the differences in means between the training and control groups were significant.