# Big Five personality factors and the prediction of behavior: A multitrait–multimethod approach ☆

## Ryan Y. Hong *, Sampo V. Paunonen, Heather P. Slade

*Department of Psychology, University of Western Ontario, London, Ontario, Canada N6A 5C2*

### Abstract

We investigated the construct validities of three, quite diverse, Big Five personality questionnaires using confirmatory factor analysis applied to multitrait–multimethod data. Participants ($N = 295$) completed three different personality questionnaires: the NEO Five-Factor Inventory (Costa & McCrae, 1992), the Five-Factor Nonverbal Personality Questionnaire (Paunonen, Jackson, & Ashton, 2004), and a 50-item bipolar adjective rating form (Goldberg, 1992). They also completed a behavior report form as a separate criterion measure. The multitrait–multimethod analyses provided evidence for the convergent validity and, to a lesser extent, the discriminant validity of the Big Five personality measures. Criterion-related validities of the Big Five measures were also supported.
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## 1. Introduction

The Big Five model of personality structure (or the Five-Factor Model) has received tremendous empirical interest over the past several years. As a consequence, some consensus is emerging among personality researchers with regard to its components (Digman, 1990; John & Srivastava, 1999) and its role in explaining a wide variety of important life outcomes (Ozer & Benet-Martínez, 2006; Paunonen, 2003). Accompanying the plethora of research on the Big Five, researchers have developed a number of different measures that purportedly define the model (see De Raad & Perugini, 2002). Those measures include, to

name a few, the NEO Personality Inventory – Revised and the NEO Five-Factor Inventory (NEO-PI-R and NEO-FFI; Costa et al., 1992), the Five-Factor Nonverbal Personality Questionnaire (FF-NPQ; Paunonen, Ashton, & Jackson, 2001; Paunonen, Jackson, & Ashton, 2004) and Big Five adjective trait markers (Goldberg, 1992).

Despite a general consensus regarding the structure of personality, subtle differences still exist among different five-factor conceptualizations and operationalizations. Some of those differences have arisen as a result of divergent historical and methodological backgrounds associated with different research traditions (see John & Srivastava, 1999, and McCrae & John, 1992, for reviews). We refer here to the search for personality structure through (a) the analysis of the words we use to describe one another, the so-called lexical approach, or (b) the analysis of the scales and inventories we use to measure people, the so-called questionnaire approach (e.g., see De Raad & Perugini, 2002).

One of the disparities in different flavors of the Five-Factor Model concerns the interpretation of the smallest of the Big Five factors. The lexical tradition in Big Five research has concluded that the fifth factor should be called

* Corresponding author. Address: Department of Psychology, National University of Singapore, 9 Arts Link, Singapore 117570. Tel.: +65 6516 6120; fax: +65 6773 1843.
E-mail address: ryan.hong@nus.edu.sg (R.Y. Hong).

Intellect, or perhaps Culture. Intellect, as proposed by Goldberg (1990, 1992), refers to a personality dimension describing someone who is perceptive, knowledgeable, curious, and imaginative. On the other hand, analysis of questionnaire data has led to the fifth factor being labeled as Openness to Experience – the propensity to pursue aesthetic interests, and to being open to a variety of novel ideas, values, and experiences (Costa & McCrae, 1992). Such apparently slight differences in the conceptualization of Big Five factors, and in their corresponding psychometric instruments, can have important implications for questions of construct validity.

The convergent and discriminant properties of different Big Five measures are best evaluated within a multitrait–multimethod framework (MTMM; Campbell & Fiske, 1959) using a confirmatory factor analysis (CFA) approach (Marsh & Grayson, 1995; Millsap, 1995; Widaman, 1985). To date, the handful of such studies that have been conducted have generally provided support for the construct validity of the Big Five personality factors and their various measures (Benet-Martínez & John, 1998; Borkenau & Ostendorf, 1990; DeYoung, 2006; Lim & Ployhart, 2006). CFA–MTMM studies that evaluated the extent to which personality ratings from different sources (self, peer, or parent, etc.) yielded meaningful personality trait variance have also provided support for the construct validity of the Five-Factor Model (Baker, Victor, Chambers, & Halverson, 2004; Barbaranelli & Caprara, 2000; Biesanz & West, 2004).

Although support for the construct validity of Big Five measures has been found, the relevant studies have some limitations. One limitation is the total reliance on the verbal representation of personality questionnaire items, either in the form of behavior-descriptive statements (e.g., the NEO-PI-R) or as trait adjective markers (e.g., Goldberg's adjective markers). The use of a common (linguistic) modality of item representation may contribute to method variance in the MTMM analyses, thereby inflating some of the factor intercorrelations and affecting discriminant validity. A more stringent test for construct validity would be to include Big Five measures that do not utilize such verbal representations as items (such as a nonverbal measure of personality; see Hong & Paunonen, in press; Paunonen & Ashton, 2002). By using Big Five personality instruments based on maximally different methods of assessment (adjective vs. statement ratings; verbal vs. nonverbal items), the construct validity of the Five-Factor Model of personality structure can be better delineated (see Campbell & Fiske, 1959).

Another limitation of past CFA–MTMM studies is that the criterion-related validities of different Big Five personality measures have seldom been evaluated (Bentler, 2007). This is important, because the extent to which there is congruence in the predictions of a criterion variable by the different measures of a Big Five factor provides crucial information about the construct validity of those instruments. If different Big Five measures assess the same factors in the latent personality space, then their relations

with criterion variables would be expected to converge (Paunonen, 2003). We elected to address this issue by first obtaining the latent Big Five factors via the CFA–MTMM approach and then correlating them with criterion variables (see Graham & Collins, 1991). These criteria were selected a priori based on their demonstrable involvement with the Big Five in other studies. Moreover, because idiosyncratic instrument-specific effects associated with the different Big Five measures are partialed out in the derivation of latent Big Five factors, the present CFA–MTMM analytic strategy allowed us to obtain more generalizable estimates of the hypothesized factor–criterion relations.

## 2. Method

### 2.1. Participants and procedure

Participants were undergraduate students ($N = 295$; 92 men) from a large Canadian university. The mean age for the total sample was 18.9 (SD = 1.72, range = 17–36); two respondents did not report their ages. Participants completed three different personality inventories, along with a behavior report questionnaire, in a classroom setting in groups ranging from 5 to 20 people.

### 2.2. Big Five measures

Three Big Five measures were used in this study: (a) The NEO Five-Factor Inventory (NEO-FFI; Costa et al., 1992), (b) the Five-Factor Nonverbal Personality Questionnaire (FF-NPQ; Paunonen et al., 2004), and (c) Goldberg's (1992) B5-ADJ adjective rating scale.

*NEO-FFI.* The NEO-FFI (Costa et al., 1992) is a 60-item inventory. It is one of the most widely used questionnaires for measuring the Big Five personality factors. Participants in our study rated the 60 behavior-descriptive statements on 5-point Likert-type scales, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), indicating the degree to which they thought the items were characteristic of them.

*FF-NPQ.* The FF-NPQ is a novel personality inventory that uses 60 nonverbal pictorial items to measure the Big Five factors. It was developed using an item pool of psychometrically established nonverbal items selected from the longer Nonverbal Personality Questionnaire (Paunonen et al., 2001) to mirror the Big Five factors defined in Costa and McCrae's (1992) NEO-FFI. All items consist of pictorial depictions of personality-relevant behaviors being exhibited in specific situations (see Paunonen, 2003, and Paunonen & Ashton, 2002, for FF-NPQ instructions and example items). Respondents in this study rated the likelihood that they would engage in those types of behaviors depicted by the items using a 7-point scale ranging from 1 (*extremely unlikely*) and 7 (*extremely likely*). The FF-NPQ has demonstrated satisfactory levels of internal consistency reliability and convergent validity with other Big Five measures of personality (Paunonen, 2003; Paunonen et al., 2001).