A Closer Look at the Test of Personal Intelligence Presentation

John D. Mayer  
*University of New Hampshire, Durham, jack.mayer@unh.edu*

A. T. Panter  
*University of North Carolina*

David R. Caruso  
*Yale University*

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Overview

Personal intelligence is the capacity to reason about personality and personality-related information. To understand more about the structure of the mental abilities involved in personal intelligence, we fit several factor models to an ability-based test of personal intelligence. A two-factor oblique simple structure model fit the data well. The findings inform us about the nature of abilities people use to understand personality in themselves and others.

Introduction

Personal Intelligence (PI): Quick Background

A number of theories in psychology identify key aspects of understanding personality in oneself and others.

- Psychological mindedness
- Interpersonal sensitivity
- Understanding personality in themselves and others.
- Personal intelligence

General and Broad Intelligences

In the Cattell-Horn-Carroll model of intelligences, g (general intelligence), is at the top of a three-tiered hierarchy, with broad intelligences in the middle level and specific skills at the bottom. Figure 1. depicts a schematic illustration.

Figure 1. The General Form of the Cattell-Horn-Carroll Model

- Level 1: General intelligence
- Level 2: Broad intelligences (g)
- Level 3: Specific abilities

Personal Intelligence as a Broad Intelligence

We regard personal intelligence as a broad intelligence parallel to social and emotional intelligences) to synthesize these viewpoints.

Methods

Participants

Participants were drawn from three archival samples:

Study 1. 10,318 test-takers drawn from seven samples, mostly from the United States Military, divided into Exploratory (odd-numbered) and Cross-Check (even-numbered) participant subsamples

Study 2. An independent sample of 8,459 military personnel


Measures

- The S3-Item Test of Personal Intelligence (Version 1.4) described earlier
- Assorted criterion scales in Study 3, including:
  - A measure of the Big Five
  - Psychological mindedness
  - Psychopathological symptom checklists
  - The Mayer-Salovey-Caruso Emotional Intelligence Test
  - The Reading the Mind in the Eyes Test (a measure of interpersonal sensitivity)
  - An estimate of g (a vocabulary measure)

Overview of the TOPI Test

The Test of Personal Intelligence Version 1.4 (TOPI 1.4) is an ability-based test developed to measure individuals’ levels of personal intelligence (Mayer, Panter, & Caruso, 2012; Mayer & Skimmyhorn, 2017). The test falls within one of four areas of problem solving just described. A sample item asks:

If a person wants to be with one or more people, talk to them, go with them, and have a good time, the person is likely going to:

- a. be in love
- b. express warmth toward someone
- c. meet a goal of excellence
- d. socialize

The test-taker who answers this item correctly (alternative “d”) must assess the given behaviors and extract from them the most likely motive.

Overview of Studies

We tested several factor models of PI by examining item-level responses to the S3-item TOPI 1.4 from two independent samples (Studies 1 and 2), and then created factor-based scales to represent them. We also reanalyzed data from an earlier study (Mayer, Panter, & Caruso, 2012) to assess the new tests correlations with criteria (Study 3).

Hypotheses

Our key hypotheses were that:

1. We could fit a factor model to the test.
2. The factors would be interpretable.
3. The resulting factor scales would be reliable.
4. The scales and their composite would correlate with important criteria.

Results

Could a Factor Model be Fit to the Test?

We began fitting models by conducting a series of exploratory factor analyses. The 2-factor model exhibited the best fit in the exploratory analysis (Table 1) and appeared interpretable.

- In order to fit the two-factor model using confirmatory factor analysis, we dropped 25 items, yielding a 68-item test. We then tested a confirmatory factor model. The 2-factor model fit well (Table 1). Subsequently, we dropped one further item based on an IRT model, for a final 67-item test. Model fits for CF1 and TLI were around .95 with RMSEA = .02.

Were the Factors Interpretable?

Based on an examination of the highest-loading items on each factor, we identified them as follows:

- Consistency-Congruence Personal Intelligence (GC). Items loading on this factor asked about consistent patterns across traits.
- Dynamic-Analytic Personal Intelligence (DA). Items on this factor addressed reasoning about personality dynamics and integrating information.

Both scales yielded coefficient alpha reliabilities of .75 or higher (after they did their composite), and exhibited similar, although slightly lower, marginal reliabilities using an IRT model. The latter result was probably owing to less precision in measurement at the higher end of the test scale. The two factors exhibited obtained correlations of r = .59 to .64 across studies (see Table 2 for details).

Were the New Scales Predictive of Criteria?

In a further analysis, the two factor scales and their composite exhibited significant relations with g (as a broad intelligences ought to) as well as other relations with criteria comparable to those of the original scale (Table 3).

Discussion and Conclusions

The present research enhances our understanding of the mental abilities underlying personal intelligence. The theory already had specified four key areas of problem solving that help to identify relevant test items to use in measurement:

- Recognizing personality-relevant information
- Formulating models of personality
- Guiding choices with such information, and
- Socializing

Using that division to develop our test-items, we then fit a factor model that concluded that there existed two mental abilities people used to solve such problems: one focused on recognizing the consistencies in personality, and the other more focused on analyzing dynamics and sometimes inconsistent information about a person and making sense of it. The two classifications are depicted together in Figure 2.

Key Sources