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EVALUATION CENTER
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RENDERED TO

True Colors International
Santa Ana, CA

PRODUCT EVALUATED: True Colors Assessment
EVALUATION PROPERTY: DATA RELIABILITY

1. Table of Contents

2. Introduction

This document is provided as a tool for end-users of the True Colors Assessment to allow comparisons between the True Colors Assessment and other multi-dimensional models in the marketplace.

The True Colors instrument, and most similar instruments, are *ipsative* in design. That is, they are self-report inventories that measure *qualities* (traits) as individuals perceive those traits within themselves, and they ask the respondent to choose one trait at the exclusion of the others. This is done via either/or, most/least, or rank-order responses to the instrument. The result is *not* an absolute set of scores that would easily fit in a normative field, but rather a *relative* set of scores that applies to an individual's self-perception. The success of all self-report instruments depends on the insight, candor, honesty, and insight of the respondent. We will provide the essential types of statistical analysis herein, and we caution the reader to be aware of over-analyzing ipsative data. Some companies produce many pages of tables applying normative statistical rules to ipsative data, and we caution the reader to be aware of this. The True Colors assessment is not a *quantitative measure* (like levels of cholesterol or blood pressure), but rather a *qualitative measure* that an individual report about themselves.

APA Guidelines

Evaluation was conducted in accordance with the Standards for Educational and Psychological Testing; developed jointly by the American Educational Research Assn. (AERA), American Psychological Association (APA), and the National Council on Measurement in Education (NCME).

Evaluation Dates

- Data evaluation began June 17, 2021.
- Data evaluation was completed on June 25, 2021.

3. Test Data Preparation

3.1 SAMPLE SELECTION

Sample data was submitted to ASI directly from the client and were not independently selected for testing. Samples are requested to:

- Be a sufficient number to represent the general population.
- Be randomly selected.

The sample panels were received at the ASI Evaluation Center by email on June 3, 2021.

SAMPLE SIZE: N = 10,000

3.2 DATA CLEANING

Upon receipt of the samples at ASI, the data was downloaded and cleaned as follows:

1. **Missing Values** – There were no missing values.
2. **Duplicates** – Duplicate entries were removed if present.
3. **Categorization** – Data was categorized and labeled by attribute type for the appropriate comparison.

4. Testing and Evaluation Methods

TEST STANDARDS

Analysis of the data was conducted using standard statistical methods. The statistical method employed was:

- Cronbach's Alpha

Cronbach's alpha

This technique is regarded as one of the most robust measures of reliability and presents the highest 'bar' from which to compare. The readers should note that Cronbach's alpha is the method selected by HRD Press authors and researchers for this instrument, because of its high standards. The reader is encouraged to compare reliability coefficients presented herein to other vendors, and also to ask those vendors which reliability formulas they used to compute their reliability coefficients.

Cronbach's alpha is a measure used to assess the reliability, or internal consistency, of a set of scale or test items. In other words, the reliability of any given measurement refers to the extent to which it is a consistent measure of a concept, and Cronbach's alpha is one way of measuring the strength of that consistency.

Cronbach's alpha is computed by correlating the score for each scale item with the total score for each observation (usually individual survey respondents or test takers), and then comparing that to the variance for all individual item scores:

$$\alpha = (\frac{k}{k-1})(1-\frac{\sum_{i=1}^{k}\sigma_{y_i}^2}{\sigma_x^2})$$

...where: k refers to the number of scale items

$\sigma_{y_i}^2$ refers to the variance associated with item i

σ_x^2 refers to the variance associated with the observed total scores

Cronbach's alpha is thus a function of the number of items in a test, the average covariance between pairs of items, and the variance of the total score.

The resulting alpha coefficient of reliability ranges from 0 to 1 in providing this overall assessment of a measure's reliability. If all of the scale items are entirely independent from one another (i.e., are not correlated or share no covariance), then alpha = 0; and, if all of the items have high covariances, then alpha will approach 1 as the number of items in the scale approaches infinity. In other words, the higher the alpha coefficient, the more the items have shared covariance and probably measure the same underlying concept.

Although the standards for what makes a "good" alpha coefficient are entirely arbitrary and depend on your theoretical knowledge of the scale in question, many methodologists recommend a minimum alpha coefficient between 0.70. Alpha coefficients that are less than 0.7 are usually unacceptable.

Researchers generally use the following guidelines to assess the data and help them interpret test-retest reliability coefficients:

- Coefficient below 0.70 are considered suspect, **Questionable**
- Coefficients above 0.70 to 0.80 are considered **Acceptable**
- Coefficients above 0.80 to 0.90 are considered **Very Good**
- Coefficients above 0.90 to 1.00 are considered **Excellent**

5. Testing and Evaluation Results

Cronbach's Alpha Reliability: Table 1

Source	Style	Alpha	N
NP	Orange	0.88	10,000
NP	Gold	0.90	10,000
NP	Green	0.88	10,000
NP	Blue	0.89	10,000

Descriptive Statistics: Table 2

Source	Style	Mean	Var	STD	Median	N
TCI	Orange	51.3	115	10.7	53.0	10,000
TCI	Gold	40.0	135	11.6	39.0	10,000
TCI	Green	39.0	120	10.9	47.0	10,000
TCI	Blue	135.1	121	11.0	43.0	10,000

* NP denotes Not Provided

The review team at ASI applauds the instrument design team at True Colors for the exceptionally high Cronbach's Alpha scores achieved in our review. All four themes present in the Very Good to Excellent ranges, and we do not experience this consistently high level of alpha scores in many of the instruments that we review. These numbers indicate the precision by which the True Colors instrument design team engaged in order to produce these levels.

6. Conclusions

The data submitted for evaluation passed all acceptable standards and is therefore awarded ASI Certification.

Certified
June 25, 2021

7.Document Review

ASI TESTING SERVICES

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