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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: DISPARATE IMPACT

1. Table of Contents

2. Introduction

This document is provided as a tool for end-users of multi-dimensional Assessments to allow comparisons between the True Colors Assessment and other multi-dimensional models in the marketplace. This analysis examines the numerical properties of the assessment as they relate to EEO guidelines for Disparate Impact.

What is Disparate Impact? Employers often use tests and other selection procedures to screen applicants for hire and employees for promotion. The use of tests and other selection procedures can be a very effective means of determining which applicants or employees are most qualified for a job. However, use of these tools can also violate the federal anti-discrimination laws if they disproportionately exclude people in a protected group by race, sex, or another covered basis.

Importantly, the law does allow for selection procedures to select the best candidates based on job related requirements. If the selection procedure has a disparate impact based on race, color, religion, sex, or national origin, the employer is required to show that the selection **procedure is job-related and consistent with business necessity**. If discrimination exists, the challenged policy or practice should therefore be associated with the skills needed to perform the job successfully.

In order to determine discrimination of a protected class, a multitude of methods are available. The most prominent of these methods is the **"Four-Fifths"** rule. The four-fifths rule is a rule-of-thumb used as a general evaluation guideline. The EEOC has determined that a selection rate for any race, sex, or ethnic group which is **less than** four-fifths (4/5) (or eighty percent) of the rate for the group with the highest rate will generally be regarded by the Federal enforcement agencies as evidence of adverse or disparate impact. While a greater than four-fifths rate will generally not be regarded by Federal enforcement agencies as evidence of adverse impact, it should be noted however, that smaller differences in selection rate mean values may nevertheless constitute adverse impact, where the differences are significant in both statistical and practical terms.

The purpose of this study is to apply the four-fifths rule to the True Colors assessment data. Comparison ratios of mean scores by protected class will be made to determine if mean ratio values are greater than or less than the 80% guideline. Comparison of the protected class group are made against the other groups not in the specified protected class (the Control Group).

EEO Guidelines

According to EEOC Guidelines, “Each user should maintain and have available for inspection records or other information which will disclose the impact which its tests and other selection procedures have upon employment opportunities of persons by identifiable race, sex, or ethnic groups… in order to determine compliance.

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 22, 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 and protected class for the appropriate comparison.

4. Testing and Evaluation Methods

TEST STANDARDS

Analysis of the data was conducted using the "Four Fifths Rule". The statistical method employed was:

- Mean Ratio Comparison

Mean Ratio Comparison

In this analysis, a mean ratio is a comparison of two or more mean values that indicates their average values in relation to each other. The ratio compares the two averages by division, with the dividend or number being divided (numerator) as the smaller term and the divisor (denominator) as the larger term.

As part of the evaluation, the following calculations were used.

1. Arithmetic Mean (AM) - If *n* numbers are given, each number denoted by a_i (where i = 1,2, ..., n), the arithmetic mean is the sum of the *a*s divided by *n* or

$$\mathrm{AM} = \frac{1}{n}\sum_{i=1}^{n} a_i = \frac{a_1 + a_2 + \cdots + a_n}{n}$$

2. Standard Deviation – is a measure of the amount of variation or dispersion in the data set. A high standard deviation relative to the mean, indicates that the values are spread out over a wide range.

The formula used for standard deviation is:

$$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \bar{x})^2},$$

3. Mean Ratio – The Mean Ratio was determined by comparing the protected class mean to the comparison group mean where the smallest number is the numerator, and the largest mean is the denominator.

5. Testing and Evaluation Results

The tables below illustrate the results when **Gender** orientation across respondents is compared against the Control Group. One can see that each of the categories are found to be within the acceptable limits for the four-fifths rule. Gender orientation is a protected category under the EEO guidelines.

True Colors: Findings by GENDER: Orange Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Male	48.53	11.03		
Female	52.81	10.27	0.92	Yes
Other	53.94	9.53	0.90	Yes

True Colors: Findings by GENDER: Gold Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Male	41.57	11.37		
Female	38.70	11.47	0.93	Yes
Other	48.81	11.91	.85	Yes

True Colors: Findings by GENDER: Green Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Male	41.96	10.45		
Female	48.38	10.49	0.87	Yes
Other	39.88	9.56	0.95	Yes

True Colors: Findings by GENDER: Blue Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Male	47.95	10.28		
Female	48.38	10.49	0.99	Yes
Other	37.36	11.67	0.78	*

* Insufficient sample size

The tables below illustrate the results when **Race & Ethnicities** of various categories are compared against the Control Group. One can see that each of the categories are found to be within the acceptable limits for the four-fifths rule.

True Colors: Findings by RACE & ETHNICITY: Orange Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Caucasian	51.09	11.09		
African American	53.11	9.60	0.96	Yes
Asian	52.38	9.90	0.98	Yes
Hawaiian or Pacific Islander	46.00	11.20	0.90	Yes
Latino or Hispanic	50.85	10.26	0.99	Yes
Middle Eastern	51.26	9.32	0.99	Yes
Native American	49.82	9.54	0.98	Yes

True Colors: Findings by RACE & ETHNICITY: Gold Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Caucasian	39.96	11.94		
African American	37.38	9.94	.94	Yes
Asian	40.20	10.92	0.99	Yes
Hawaiian or Pacific Islander	41.79	11.50	0.96	Yes
Latino or Hispanic	39.35	10.81	0.99	Yes
Middle Eastern	39.88	10.13	0.99	Yes
Native American	39.49	12.14	0.99	Yes

True Colors: Findings by RACE & ETHNICITY: Green Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Caucasian	45.88	11.21		
African American	48.48	9.63	0.94	Yes
Asian	44.39	10.33	0.97	Yes
Hawaiian or Pacific Islander	47.54	9.51	0.97	Yes
Latino or Hispanic	47.26	10.76	0.97	Yes
Middle Eastern	47.08	10.53	0.97	Yes
Native American	47.53	11.29	0.97	Yes

True Colors: Findings by RACE & ETHNICITY: Blue Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Caucasian	43.07	11.47		
African American	41.02	9.88	0.95	Yes
Asian	43.02	9.63	0.99	Yes
Hawaiian or Pacific Islander	44.71	10.47	0.96	Yes
Latino or Hispanic	42.54	10.74	0.99	Yes
Middle Eastern	41.78	10.25	0.97	Yes
Native American	43.15	10.97	0.99	Yes

The tables below illustrate the results when **Age** groups of various categories are compared against the Control Group. One can see that each of the categories are found to be within the acceptable limits for the four-fifths rule.

True Colors: Findings by AGE: Orange Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Under 40	49.86	10.73		
Born Before 1945	47.73	9.54	0.96	Yes
Baby Boomer 1946 to 1964	53.96	9.85	0.92	Yes
Generation X 1965 to 1980	52.30	10.73	0.95	Yes

True Colors: Findings by AGE: Gold Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Under 40	41.13	11.41		
Born Before 1945	41.87	10.29	0.98	Yes
Baby Boomer 1946 to 1964	37.63	11.19	0.91	Yes
Generation X 1965 to 1980	38.70	11.58	0.94	Yes

True Colors Findings by AGE: Green Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Under 40	46.04	10.98		
Born Before 1945	47.20	10.61	0.98	Yes
Baby Boomer 1946 to 1964	46.95	10.54	0.98	Yes
Generation X 1965 to 1980	46.00	10.96	0.99	Yes

True Colors Findings by AGE: Blue Style

Source	Mean	Standard Deviation	Ratio	Greater than 80% = Pass
Under 40	42.97	11.34		
Born Before 1945	43.20	4.74	0.99	Yes
Baby Boomer 1946 to 1964	41.46	9.87	0.96	Yes
Generation X 1965 to 1980	43.00	10.98	0.99	Yes

6. Conclusions

The True Colors assessment data submitted for investigation was evaluated by each True Colors attribute style for compliance to EEOC protected class guidelines using the 80% mean ratios formula. All the calculated ratios passed the "Four-Fifths" guideline.

The Assessment Standards Institute has found that no Four-Fifth's data is outside the 80% ratio guideline resulting in an adverse impact to any protected group, whether age, gender, race, or ethnicity. The assessment is therefore awarded ASI Certification for compliance with the EEOC Disparate Impact guidelines based on the Four-Fifth's analysis procedure.

Certified
June 26, 2021

7. Document Review

ASI TESTING SERVICES

Signed: *Russell J. Watson, Ed.D.*

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