Dr. Tony Alessandra
Assessments 24x7
San Diego, CA

November 25, 2019

Dear Dr. Alessandra –

We applaud your efforts at making Assessments 24x7 resources as reliable and valid as possible for your clients and audience. In that endeavor, you asked our team to examine your Motivators assessment and determine aspects of reliability and data stability of the assessment. There are a number of ways to investigate reliability. One of those methods is to examine the reliability, or consistency of the measures over time. That is the method we selected to use to investigate data reliability for this assessment. To do this we examined two time-samples of data from your Motivators assessment across an 18-month interval. We selected an 'N' of 200 for each time-sample group to provide a reasonable size for statistical examination.

ASI complies with the "Standards for Educational and Psychological Testing" procedures manual. The "Standards for Educational and Psychological Testing" were approved as APA policy by the APA Council of Representatives in August 2013, and we operate from the latest 2014 edition of the document. The Testing Standards are a product of the American Educational Research Association, the American Psychological Association and the National Council on Measurement in Education. Published collaboratively by the three organizations since 1966, it represents the gold standard in guidance on testing in the United States and in many other countries. Additionally, we follow the American National Standards Institute guidelines. ANSI is a non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States. Combined, these standards represent the highest quality standards we can apply to the rigorous statistical processes we employ.

The Motivators assessment is evaluated using a mean value ratio. This method systematically examines the mean values of each of the seven themes explored in the Motivators assessment. Our team is pleased to announce that your assessment meets the generally accepted standards of data stability based on the time-sample, mean value ratio method. Please share the accompanying Certificate with your customers and clients. Should they need more information, you may share the detailed reports as well. It is our experience that many companies will accept the Certificate without needing further detailed documentation.

We wish you the best,

Dennis W. Koerner, PhD
President and CEO

Russell J. Watson, EdD
Chief Psychologist

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EVALUATION CENTER
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RENDERED TO

Assessments 24x7
San Diego, CA

PRODUCT EVALUATED: Motivators Assessment
EVALUATION PROPERTY: DATA STABILITY – EXTERNAL RELIABILITY

1. Table of Contents

2. Introduction

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

All Motivator instruments, 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 personal insight, candor, willingness to self-disclose, and integrity 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. Motivator instruments do not measure *quantities* like levels of cholesterol or blood pressure, but rather *qualities* that an individual respondent reports about themselves.

APA Guidelines

Evaluation of the respondent data 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 November 1, 2019.
- Data evaluation was completed on November 25, 2019.

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 accurately represent the general population.
- Be randomly selected.

The sample panels were received at the ASI Evaluation Center by email on November 1, 2019. Two sets of data were received for comparison. Each data set was from a different time period. Data Set 1 represented sample data that was less than 1 month old from the date of submission. Data Set 2 represented data that was more than 18 months old at the time of submission.

DATA SET 1 (Current) SIZE: N = 200
DATA SET 2 (18 Months Old) SIZE: N = 200

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.
3. **Categorization** – Data was categorized and labeled by attribute type for the appropriate comparison.
4. **Data Transformation** – Data was transformed using appropriate methods as necessary for comparison and use in statistical equations.

4. Testing and Evaluation Methods

TEST STANDARDS

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

- External Data Reliability using Mean Value Ratios

External Data Reliability

The term reliability in psychological research refers to the consistency of a testing or assessment method. In this case we are measuring the reliability or consistency of assessment measures over time.

As background, there are two types of reliability – internal reliability and external reliability. Internal reliability analyzes the consistency of results across items within an assessment. External Reliability measures the extent to which assessment measure varies from one use to another. In this analysis we are measuring reliability from the use of a test at one time as compared to another time. The comparison is using a mean variance measure referred to as the mean value ratio.

Mean Value Ratio

The mean value ratio measures the external or time consistency of an assessment. This is accomplished by comparing the mean values of an assessment style attribute at time period 1 to the same assessment style attribute, mean value at time period 2. In the analysis, higher values approach 1 and indicate a high level of consistency over time. The closer the mean value ratio is to zero, the lower the stability and thus reliability of the assessment over time.

The reader should note that there is no agreed-upon table in the world of statistics that 'grades' a mean value ratio as weak or strong in absolute, definitive terms. As a result, specific commentary by a field of researchers may vary with regard to what they consider to be 'strong' or 'weak' correlations.

The team of scientists at ASI have selected to establish the criteria for rating of Mean Value Ratios as posted below.

- 0.00 – 0.59   "Very Weak"
- 0.60 - 0.69   "Weak"
- 0.70 - 0.79   "Moderate"
- 0.80 - 0.89   "Strong"
- 0.90 - 1.00   "Very Strong"

Other statisticians may present divergent opinions based on their own scientific observations and training.

5. Testing and Evaluation Results

The table below provides a summary of both the mean values and standard deviations for all seven of the motivator attribute styles measured in this analysis.

Summary of Mean and Standard Deviations: Table 1

Attribute	18Months	18MonthStdev	Current	CurrentStdev
Theoretical	47	16	49	14
Economic	58	21	57	19
Individualistic	49	18	56	15
Altruistic	53	18	47	17
Political	50	15	54	17
Regulatory	49	15	41	15
Aesthetic	40	14	43	19

The table below shows the ratio of the mean values when the 18-month-old data from respondents is compared to respondent test results from current data. One can see each of the ratios are found to be within the acceptable limits for the guidelines as established above.

Summary of Mean Ratios: Table 2

Attribute	Mean Value Ration 18M to Current
Theoretical	97%
Economic	98%
Individualistic	87%
Altruistic	89%
Political	93%
Regulatory	84%
Aesthetic	92%

A detailed comparison of data distributions using a histogram along with a plot of mean values and corresponding standard deviations are provided for each motivator assessment style below.

Comparison of 18 Month vs Current: Theoretical Table 1

Individual Samples		
Statistics	Theo-18	Theo-Current
Sample size	200	200
Mean	47.07	48.605
95% CI	(44.90, 49.24)	(46.595, 50.615)
Standard deviation	15.579	14.413

Comparison of 18 Month vs Current: Theoretical Graph 1

Distribution of Data
Compare the data and means of the samples.
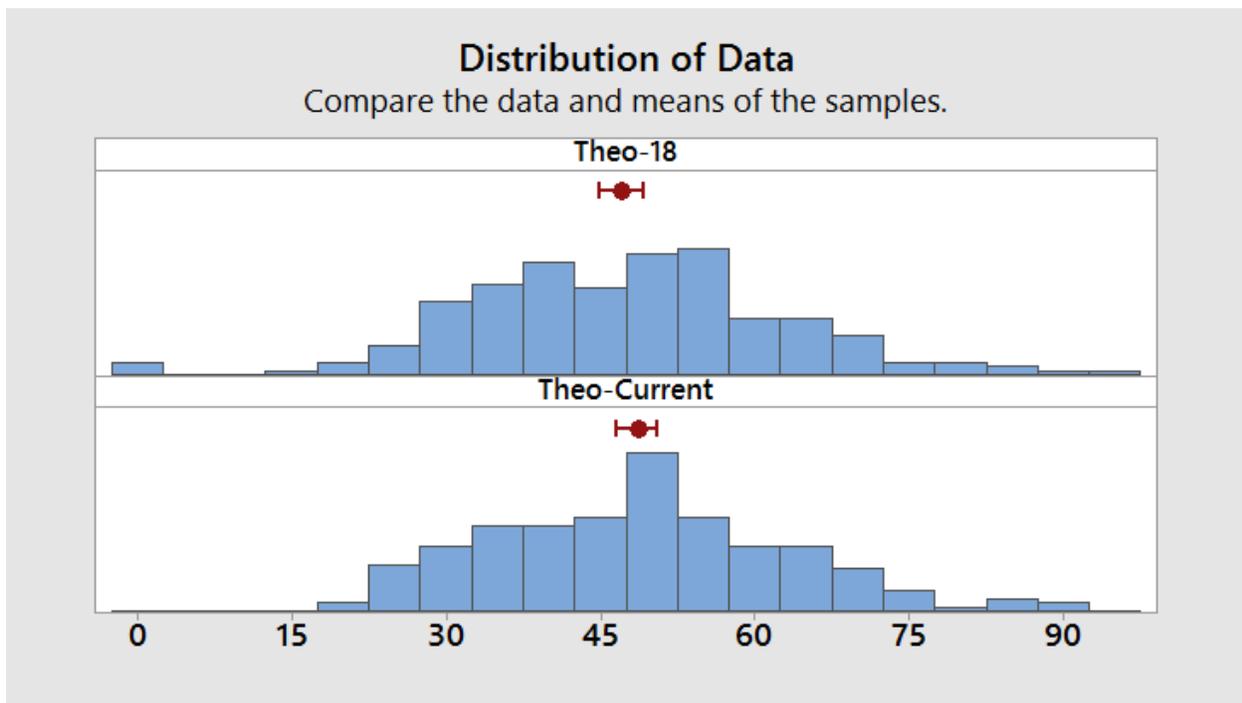
The histograms above describe the results of the Theoretical motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

Comparison of 18 Month vs Current: Economic Table 2

Individual Samples		
Statistics	Econ-18	Econ-Current
Sample size	200	200
Mean	57.73	56.8
95% CI	(54.83, 60.63)	(54.110, 59.490)
Standard deviation	20.815	19.290

Comparison of 18 Month vs Current: Economic Graph 2

Distribution of Data
Compare the data and means of the samples.
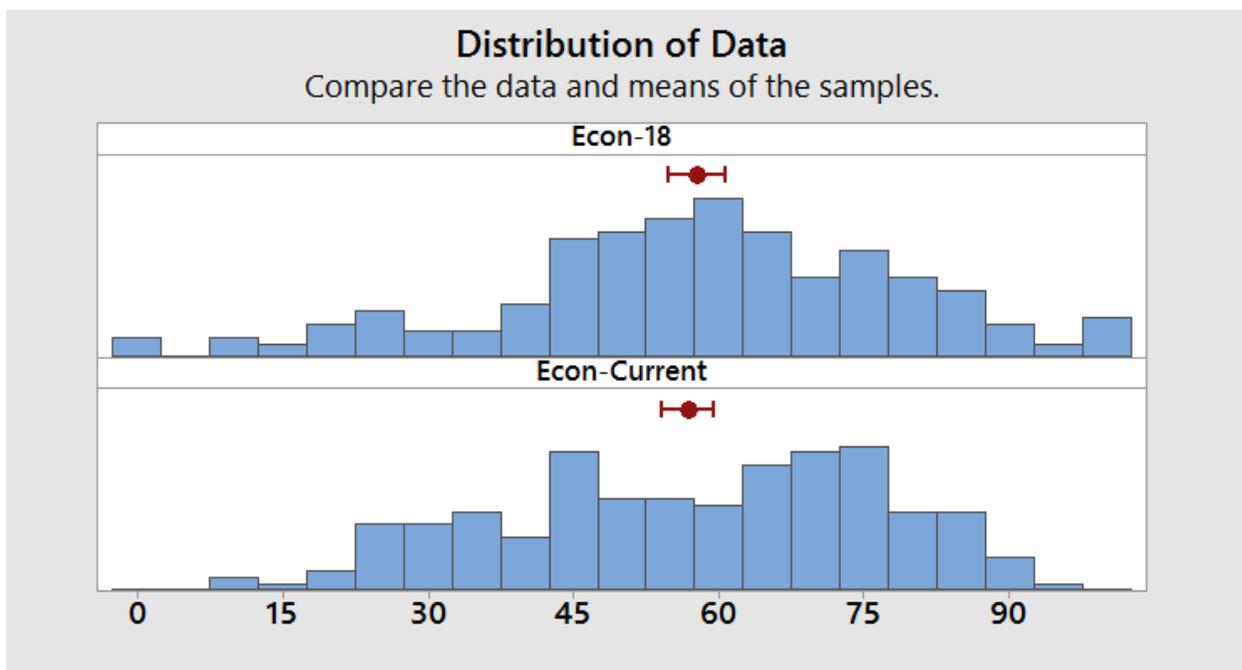
The histograms above describe the results of the Economic motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

Comparison of 18 Month vs Current: Individualistic Table 3

Individual Samples

Statistics	Indi-18	Indi-Current
Sample size	200	200
Mean	49.15	56.265
95% CI	(47.23, 51.07)	(54.195, 58.335)
Standard deviation	13.768	14.847

Comparison of 18 Month vs Current: Individualistic Graph 3

Distribution of Data
Compare the data and means of the samples.
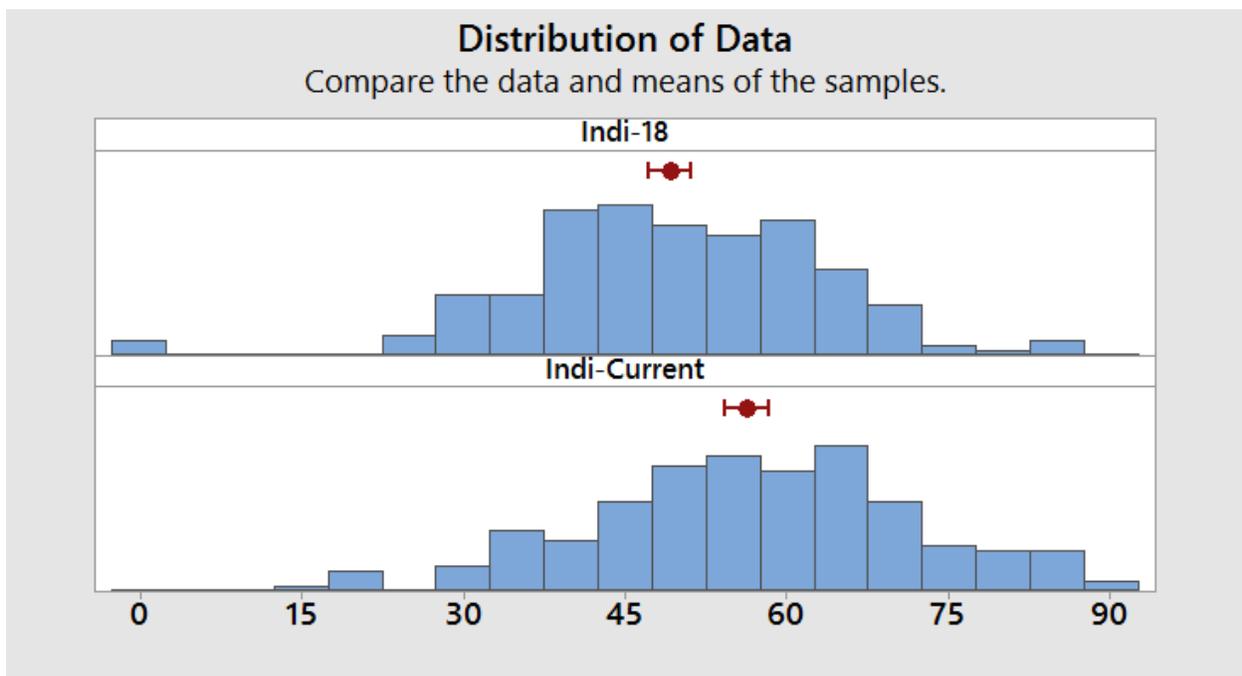
The histograms above describe the results of the Individualistic motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

Comparison of 18 Month vs Current: Altruistic Table 4

Individual Samples

Statistics	Altr-18	Altr-Current
Sample size	200	200
Mean	53.26	47.43
95% CI	(50.73, 55.79)	(44.996, 49.864)
Standard deviation	18.173	17.456

Comparison of 18 Month vs Current: Altruistic Graph 4

Distribution of Data
Compare the data and means of the samples.
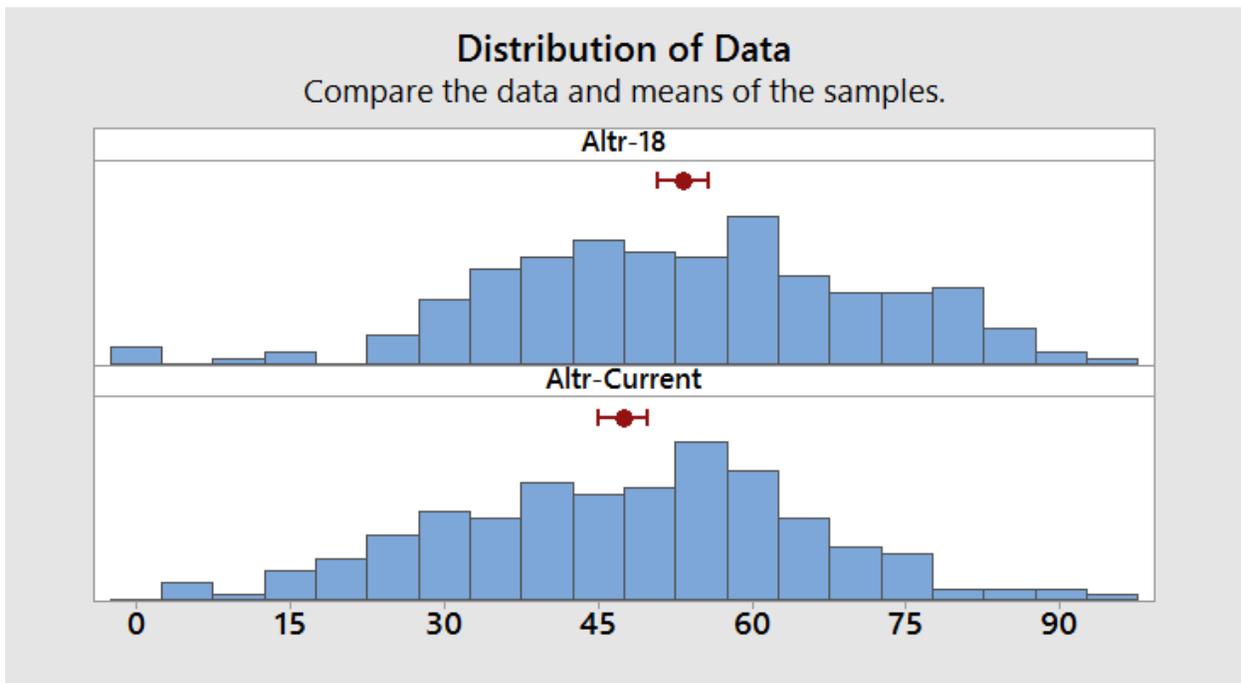
The histograms above describe the results of the Altruistic motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

Comparison of 18 Month vs Current: Political Table 5

Individual Samples		
Statistics	**Poli-18**	**Poli-Current**
Sample size	200	200
Mean	50.08	53.51
95% CI	(47.92, 52.24)	(51.097, 55.923)
Standard deviation	15.482	17.307

Comparison of 18 Month vs Current: Political Graph 5
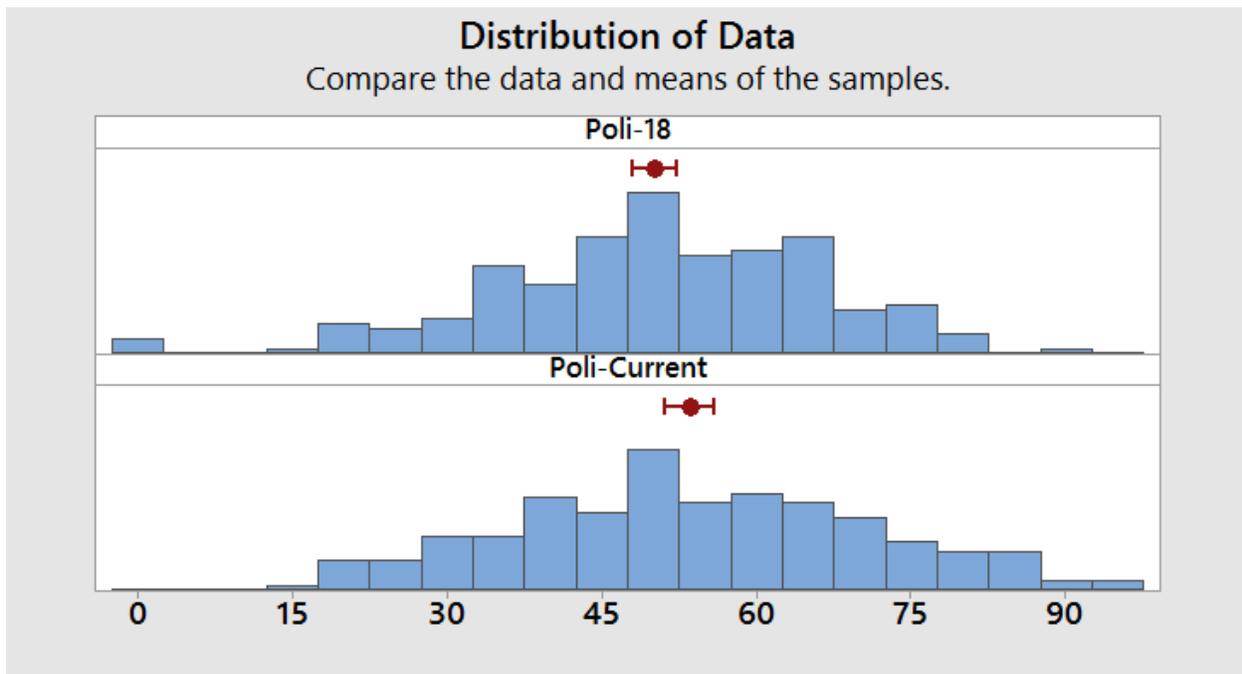
The histograms above describe the results of the Political motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

Comparison of 18 Month vs Current: Regulatory Table 6

Individual Samples

Statistics	Regu-18	Regu-Current
Sample size	200	200
Mean	49.2	41.155
95% CI	(47.15, 51.25)	(39.021, 43.289)
Standard deviation	14.676	15.304

Comparison of 18 Month vs Current: Regulatory Graph 6

Distribution of Data
Compare the data and means of the samples.
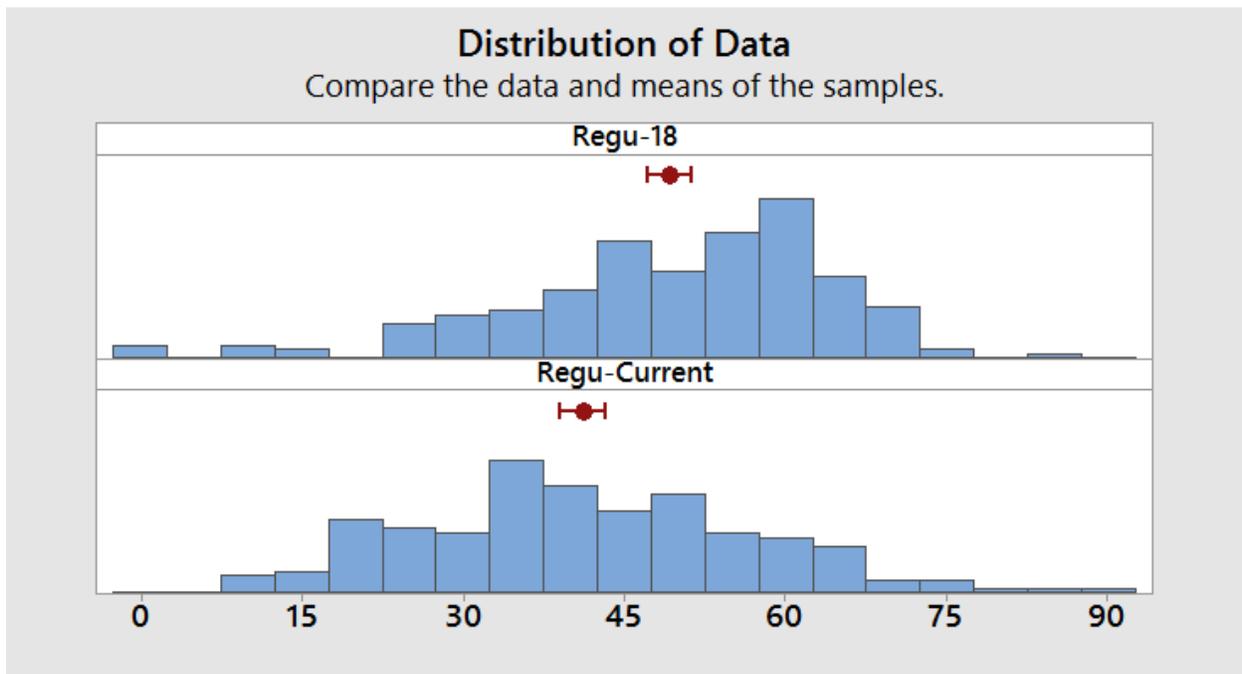
The histograms above describe the results of the Regulatory motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

Comparison of 18 Month vs Current: Aesthetic Table 7

Individual Samples

Statistics	Aest-18	Aest-Current
Sample size	200	200
Mean	40.085	42.915
95% CI	(38.12, 42.05)	(40.323, 45.507)
Standard deviation	14.092	18.587

Comparison of 18 Month vs Current: Aesthetic Graph 7
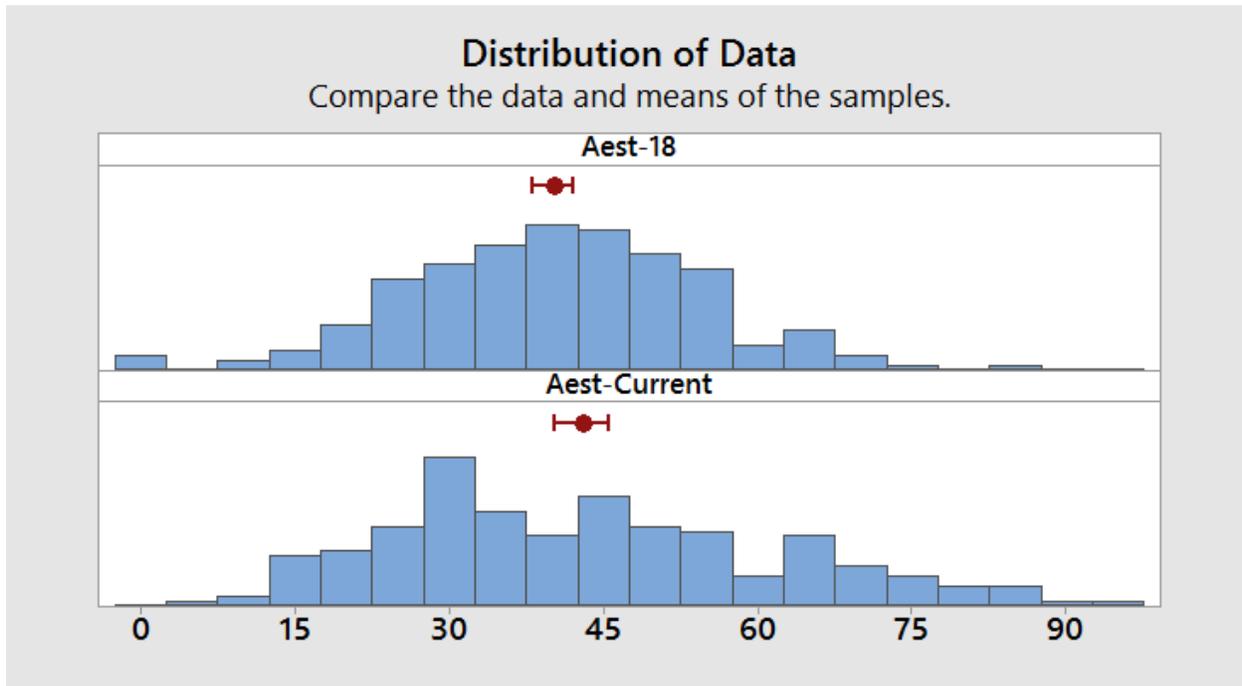
The histograms above describe the results of the Aesthetic motivators theme from a sample of data taken 18 months ago (top histogram), and a current data sample (lower histogram). The dot-and-whisker indicator above each histogram shows the mean (dot) and standard deviation (whisker) above and below the mean. One can observe similarities, and slight differences that might be expected in any time-sample, as well as the fact that the response sets are normally distributed.

6. Conclusions

The Motivators model for external data reliability proposes that the assessment measures should be consistent over time. In this evaluation the primary measure is a mean value comparison of a motivator assessment style attribute at time-sample #1 to the mean value of the same style at time-sample #2. The comparison is made as a ratio. Ratios for the seven scales shown in the composite table above and subsequent graphs support the general model for Motivators external data reliability.

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

Certified
November - 2019

Expires
January - 2025

7.Document Review

ASI TESTING SERVICES

Signed: *Dennis W. Koerner, Ph.D.*

Chief Technical Officer

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

Chief Psychologist