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## TTI's *Personal Interests, Attitudes, Values 2*

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**Date:** 10 October 2003, expanded 19 November 2004

### *Summary Conclusion*

Based on a series of examinations of scale and item reliabilities, revisions were developed and tested for TTI's *Personal Interests, Attitudes and Values* (PIAV) that culminated in development of a revised instrument. TTI provided the current data set containing 1130 responses on 1 October 2003. These data contained responses from 49.5% female, 50.5% male that are judged representative of the population using their revised *Personal Interests, Attitudes and Values* (PIAV2) through the TriMetrix distribution system. The results of assessment of this revision indicate already high or improved reliability for all six scales with Cronbach's  $\alpha$  ranging from .7 to .84. Each of the seventy-two items used to construct the scales contributes to its assigned scale. Correlations among the six scales indicate that they are substantially independent in measurements. Scores on the scales are distributed across the scales leading to meaningful comparisons and interpretation. Overall, the *Personal Interests, Attitudes and Values 2* is a strong, reliable instrument applicable across a variety of populations. The editing anchors the instrument in the interest, attitudes and values of the 21<sup>st</sup> century.



### Background

TTI's *Personal Interests, Attitudes and Values 2* instrument (PIAV2) is anchored in design and development of their prior PIAV instrument. During the late summer of 2002, TTI initiated a review of the reliability of the six scales and the associated items. That assessment utilized a sample of 2136 cases from 43,325 available cases. These data contained 60% males and 40% females. These responses represent a diverse range of those utilizing this instrument. This assessment of the revised instrument is based on 1130 responses containing 50.5% males and 49.5% females collected during the late summer of 2003 through the TriMetrix distribution system.

The PIAV instrument contains twelve frames of six phrases each. Each phrase is an indicator of one the six latent values. Respondents rank order the six items from 1=Most like me, to 6=Least like me. Scales are constructed by reversing the values, summing up related items ranks, and adjusting the score upward to avoid 0's. The scales are labeled as theoretical, utilitarian, aesthetic, social, individualistic, and traditional.

Scale reliabilities and item cohesion to assigned scales were examined as described later. Based on analysis of these indicators, a limited number of items were revised, edited, and field-tested. Item revisions were based on theoretical construction of items combined with linguistic considerations that focused on current usage and minimization of social desirability bias.

The revised PIAV2 instrument was, prior to release, subjected to several rounds of field-testing, further editing and confirmation of revisions. The current release confirms increased or high reliability in each of the scales.

### **Norming Sample**

The pedigree of the current version has involved a diversity of data sources and samples. Current item and scale reliability is the culmination of these repeated evaluations using different samples. Thus, the instrument's pedigree is strengthened by repeated independent evaluations. The norms used in the current iteration, Personal Interests, Attitudes, Values – PIAV English 2003d version, utilize a sample of 1130 respondents compiled from users of the instrument during 2002 and 2003. The sample is compiled from one delivery system – TriMetrix – in active use among businesses. The sample contained 49.5% females and 50.5% males. Respondents' age ranged from 20s through over 50 years old. Occupations include managers, service workers, trade personnel, clerks, accountants, entrepreneurs, engineers, teachers, consultants and trainers. Thus, the sample represents a full range of individuals making use of the instrument in a variety of settings.

Evaluation of reliability and calculation of the distribution norms was conducted using this sample of 1130 to confirm selection and editing conducted with multiple prior assessments. The table below summarizes this population.

PIAV – English 2003.d Descriptive Statistics		Males = 50.5%, Females = 49.5%					
	THEORY	UTILITY	ASETHETIC	SOCIAL	INDIVIDUAL	TRADITION	
<b>Valid</b>	1130	1130	1130	1130	1130	1130	
<b>Missing</b>	0	0	0	0	0	0	
<b>Mean</b>	44.15	50.13	30.23	45.88	43.60	38.01	
<b>Std. Error of Mean</b>	.28078	.31522	.30616	.29234	.25971	.32800	
<b>Median</b>	44	50	29	47	44	37	
<b>Std. Deviation</b>	9.4387	10.5963	10.2916	9.8273	8.7303	11.0259	
<b>Minimum</b>	19	16	12	15	19	14	
<b>Maximum</b>	72	72	66	71	65	68	
<b>Percentiles</b>	<b>10</b>	32	36	18	33	32	25
	<b>20</b>	36	41	21	37	36	28
	<b>30</b>	39	44	24	41	39	31
	<b>40</b>	42	47	26	44	42	34
	<b>50</b>	44	50	29	47	44	37
	<b>60</b>	47	53	31	49	46	40
	<b>70</b>	49	57	35	51	48	44
	<b>80</b>	52.	60	39	55	51	48
<b>90</b>	56	64	44	58	55	54	

## Revised Scale Reliability

Scale reliabilities were calculated using Cronbach's Alpha ( $\alpha$ ). Cronbach's  $\alpha$  is considered the most appropriate statistical test for reliability given the ranking of responses used to construct the scales. This statistic models internal consistency, based on the average inter-item correlation. It is a more rigorous test than a traditional split-half statistic. Cronbach's  $\alpha$  is bounded from 0 to 1. In general an  $\alpha$  equal to or greater than .6 is considered a minimum acceptable level, although some authorities argue for a stronger standard of at least .7.

The following table compares the original PIAV1 reliabilities and Cronbach's  $\alpha$  reliabilities from the TriMetrix data. The lowest PIAV1 reliabilities have improved substantially and in the PIAV2 exceed or equal the stronger .7 standard. These findings document the revised PIAV2 as an instrument with solid scale construction and reliability.

Cronbach's $\alpha$ reliabilities for the PIAV, English language version		
	PIAV 1 (N=2136, M=60%, F=40%)	PIAV 2 (N= 1130, F=49.5%, M=50.5%)
THEORETICAL	.69	.77
UTILITARIAN	.78	.82
AESTHETIC	.82	.84
SOCIAL	.75	.80
INDIVIDUALISTIC	.61	.70
TRADITIONAL	.62	.80

## Scale Relationships -- Correlations

In general, instrument scales should measure independent characteristics, which are indicated by none-significant and minimal positive correlations. Examinations of the relationship among the PIAV scales show only weak positive correlations and weak to moderate negative correlations, indicating a reasonable level of independence among the scales. The Theoretical and Aesthetic scales have the greatest level of independence. The Utility and Social scales have the strongest correlation. That correlation is negative, which indicates that as utility scores increase, social scores decrease and vice-versa.

Spearman rank order correlations among PIAV scales and level of significance, English version 2003.d						
	THEORY	UTILITY	ASETHETIC	SOCIAL	INDIVIDUAL	TRADITION
THEORY	1					
UTILITY	0.0336 0.2585	1				
ASETHETIC	-0.0111 0.7089	-0.2785 0.0000	1			
SOCIAL	-0.3766 0.0000	-0.5618 0.0000	0.01141 0.70157	1		
INDIVIDUAL	-0.0371 0.2122	0.1814 0.0000	-0.43555 0.00000	-0.2703 0.0000	1	
TRADITION	-0.4733 0.0000	-0.3574 0.0000	-0.26015 0.00000	0.2114 0.0000	-0.2529 0.0000	1

Correlations in gray cells are not significant at the 0.01 level (2-tailed).

## Conclusions

I've reached the following conclusions with reference to TTI's Personal Interests, Attitudes and Values 2 based on an analysis of response patterns from a diverse population of respondents.

- Scores on the scales – while not a “statistically normal” distribution – are distributed with enough variance across a range of scores to make interpretations and comparisons of individuals to distributions of these self-reported interests and values in a general population.
- Although the scales are constructed with equal numbers of items, it is important to note that the frequency response patterns among respondents selection of indicators results in scales with substantially different statistical distributions.
- The items tend to co-vary around consistent latent-construct indicators of the theoretical concepts represented by instrument descriptions.
- The six scales are constructed from coherent items with a solid reliability as indicated by Cronbach's  $\alpha$  ranging from .7 to .8.
- The revisions present in PIAV2 improve scale and item reliabilities significantly over the original version.
- Each of the seventy-two items used to construct the scales contributes to its assigned scale.

With continued assessment and review of TTI's Personal Interests, Attitudes and Values 2, this revision initiates a process of continual quality improvement.

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