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Validation Studies

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ATTITUDE/ PERSONAL SKILLS

Validation Study

This compendium is a summary of twenty studies conducted on groups of people that took the Hartman Value Profile. This compendium is possible because of the countless hours and dedication of the researchers noted in this compendium and because of the cooperation of their subjects. It is designed to serve as a general introduction and index to studies that prove the validity and reliability of the Hartman Value Profile. The complete write-ups of these studies are available from the respective authors or from Kinsel Enterprises, Inc. when noted.

This compendium summarizes studies that measured sixteen different aspects of the Hartman Value Profile. They present clear, objective proof that the Hartman Value Profile is reliable, valid, and useful for applications in business, psychology, and human development.

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THE HARTMAN VALUE PROFILE

The Hartman Value Profile is the creation of the late Dr. Robert S. Hartman and is owned by the Robert S. Hartman Institute, university of Tennessee. It is a paper and pencil exercise¹ that requires that the subject rank order eighteen different statements in two different lists. This forced ranking of the statements requires that the subject evaluate each statement and compare it to every other statement. The resultant rankings demonstrate the subject's different capacities and biases in valuing. The Hartman Value Profile is based on the science of formal Axiology. Dr. Hartman's theory of formal Axiology is described in detail in his book, The Structure of Value: Foundations of Scientific Axiology, Southern Illinois University Press, 1967.

Axiology is the formal system of identifying and measuring value. The Hartman Value Profile is one means by which we are able to measure an individual person's propensity and capacity to value. It is the person's structure of value (the road map and filtration system a person uses to think, evaluate and make decisions) that results in personality, individual perceptions, and decisions. In common parlance, a person's structure of value is how that person thinks.

That we are able to simply and objectively measure a person's structure of value has significant ramifications for mental health and business. The Hartman Value Profile eliminates much of the need for arduous and expensive psychological testing for either clinical or business purposes. It provides an easy to use, objective, deductive, measurement which can be (and has been) used for counseling, training, and development. Businesses have used the Hartman Value Profile in candidate selection, designing of training, and measuring the efficacy of their training and development programs (before and after measurement of growth, change, or improved skills).

The most comprehensive book to date covering Dr. Robert Hartman, formal Axiology, and the uses of Axiology is Dr. Rem B. Edwards' and John W. Davis's book: Forms of Values and Valuation, University Press of America, 1991.

¹ InnerMetrix, Inc. has created computer programs to automate the original paper and pencil instrument

VALIDATION

Validating tests is the multi-faceted discipline that determines the accuracy, dependability and the consistency of an instrument with the scientific theories supporting it. Validation measures how closely a testing instrument's scores correspond to measurable behaviors or characteristics. It also establishes the reliability of the instrument, insuring that the nature of the instrument does not significantly effect the outcomes. The process of validating an instrument is compartmentalized with each different process measuring different aspects about the instrument.

This paper is a compilation of summaries of twenty validation tests on the Hartman Value Profile. These summaries outline specifically the Hartman Value Profile's viable, replicable, objective, and reliable findings. They also demonstrate that the Hartman Value Profile meets the requirements of the E.E.O.C. All the studies described within this paper comply with the American Psychological Association's guidelines for analysis of psychometric instruments and follow industry-standard procedures for statistical analysis.

EEOC REQUIREMENTS

The Equal Employment Opportunity Commission (E.E.O.C.) has established that screening instruments, psychological testing, personality tests, and all other evaluation procedures that are used in industry are to fulfill the Uniform Guidelines on Employment Selection Procedures (1978).

“Employer policies and practices which have an adverse impact on the employment opportunities of any age, race, sex, or ethnic group are illegal...

Employer decisions include, but are not limited to hiring, promotion, demotion, membership, referral, licensing, and certification.”

[Federal Registry, Vol. 43, No. 166, 8/25/78]

The Conclusion from these studies is that the Hartman Value Profile does comply with the E.E.O.C. requirements insofar as it does not discriminate against persons of different racial origins, sexes or ages.

DISCRIMINATION BY AGE

The Age Discrimination in Employment Act of 1967 states that employers may not discriminate against employees and applicants older than 40 years old in their hiring and promotion practices. Therefore in order for a test to be legal, it must be found to have no statistical bias between people older than 40 years old and people under 40 years old.

Age: Study A

This study was conducted by Value, Inc. (Wayne Carpenter and Edward Martin), 1987.

Two separate sample populations of 200 persons were built from a group of more than 6,000 people by random selection. The groups represented adults below the age of thirty and adults above the age of 40. The two-sample parametric interval data T-test was used to measure statistical significance.

The Hartman Value Profiles generated 54 different scores on each participant. The T-test value would have to have been above 1.282 in order for there to be some discrimination between the ages (resulting in a $p > .2$). For all 54 items $p < .01$, thus proving that **the Hartman Value Profile does not discriminate against persons of particular ages or age groups.**

Age: Study B

This study was conducted by The Institute for the Study of Human Values (Dr. Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald), and funded by a grant from the Dollar General Corporation, 1987.

The sample population was 1,075 persons who were either employed or seeking employment within a large corporation. The ages of the participants ranged in ages from below 18 to over 70 and were grouped into groups of <30 (421 persons), 30-39 (298 persons), 40-49 (200 persons), and >49 (156 persons). Analyses of the results were completed both according to the individual ages and on four clusters of age groupings.

The null hypothesis used was: “that mean ranks for different aged persons for the following normative items will not be significantly statistically different when using the Hartman Value Profile.”

The results proved that the Hartman Value Profile does not discriminate between people of different ages. This is true with analysis being done either by individual ages

Discrimination by Age-Continued

or as part of an age grouping. All means rankings were proven to not be different with a very high statistical significance of $.0395 > p < .0005$.

DISCRIMINATION BY SEX

Title VII of the 1964 Civil Rights Act stipulates that an employer may not discriminate in hiring and promotion practices or the terms and conditions of employment because of the individual's sex.

Sex: Study A

This test was conducted by Value Inc.(Wayne Carpenter and Edward Martin), 1987.

Two separate sample populations of 200 people were built from a group of more than 6,000 people by random selection. The one group was males and the other females. The two-sample parametric interval data T-test was used to measure statistical significance.

Fifty-four scores for each participant's profile were measured and compared. The results were that all 54 scores, using the T-test, were found to have a $p < .01$. The conclusion is: "in compliance with EEOC regulations, the H_0 (null hypothesis) is that the mean ranks for men and women for the following normative items will not be significantly statistically different when using the Hartman Value Profile."

This study proves that the Hartman Value Profile does not discriminate between males and females.

Sex: Study B

This study was conducted by The Institute for the Study of Human Value (Dr. Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald), and funded by a grant from the Dollar General Corporation, 1987.

A sample population was 1,075 persons who were either employed or seeking employment within a large corporation. There were 92 men and 983 women in the study. Analysis of the results were completed using the F ratio between the groups and the $E\ t_a^2$ which measures the proportion of the total variability in the dependent variable that can be accounted for by knowing the values of the independent variables.

The null hypothesis used was: "that mean ranks for men and women for the following normative items will not be significantly statistically different when using the Hartman Value Profile."

The Results proved that the Hartman Value Profile does not discriminate between people of different sexes. Of the 36 items tested, 29 had no statistical significance at all and the other 7, where the mean ranks of the male and female subjects were significantly different, the $E\ t_a^2$ indicated that less than 1% of the difference was due to sexual gender (with statistically significant p values ranging from $<.0490$ to $<.0086$).

DISCRIMINATION BY RACE

Title VII of the 1964 Civil Rights Act stipulates that an employer may not discriminate in hiring and promotion practices or the terms and conditions of employment because of the individual's race.

Race: Study A

This test was conducted by Value Inc.(Wayne Carpenter and Edward Martin), 1987.

Two separate sample populations of 200 participants were built from a group of more than 6,000 people by random selection. The groups represented adults of Caucasian race and of the African American race. The two-sample parametric interval data T-test was used to measure statistical significance.

54 scores for each participant's profile were used measured and compared. The results were that all 54 scores, using the T-test, were found to have a $p < .01$.

This statistically significant result proves that the Hartman value Profile does not discriminate among different races.

Race: Study B

This study was conducted by The Institute for the Study of Human Value (Dr. Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald), and funded by a grant from the Dollar General Corporation, 1987.

A sample population was 1,075 persons who were either employed or seeking employment within a large corporation. There were five racial groups represented: Asian, African American, American Indian, Hispanic, and Caucasian. Analysis of the results were completed using the F ration between the groups and the $E \text{ ta}^2$ which measure the proportion of the total variability in the dependent variable that can be accounted for by knowing the values of the independent variables.

The null hypothesis used was: "that mean ranks for persons of different racial origins for the following normative items will not be significantly statistically different when using the Hartman Value Profile."

The Results proved that the Hartman Value Profile does not discriminate between people of different races. Of the 36 items tested, 31 had no statistical significance at all and the other 5, where the mean ranks of the subjects were significantly different, the $E \text{ ta}^2$ indicated that less than 1% of the difference was due to racial difference (with statistically significant p values ranging from $<.0144$ to $<.0001$).

FACE VALIDITY

Face validity is the measure of how the structure and content of each statement on the Hartman Value Profile is consistent with scientific, axiological theory. Unlike other validation studies, this study is more of an assessment as to whether each statement accurately expresses the value and valuation defined by Dr. Robert S. Hartman in the science of formal Axiology.

This study was conducted by The Institute for the Study of Human Value (Dr. Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald), and funded by a grant from the Dollar General Corporation, 1987.

The procedure followed was for the axiologist to evaluate each statement according to:

1. the concept
2. the value dimension
3. the valuation
4. whether the concept is correct
5. whether the value dimension is correct
6. whether the valuation is correct

After completing these analyses for each of the 36 statements, the team then reviewed Dr. Hartman's analysis of those same statements to confirm agreement. **In every case, the validation team's analysis concluded that each statement was an accurate expression of the value and valuation for each of the intended combinations.** They also concluded that in every case, they arrived at the same conclusions as did Dr. Hartman.

This independent analysis along with the matching of conclusions with Dr. Hartman's provides high confidence that the structure and content of every statement in the Hartman Value Profile is axiologically valid.

RELIABILITY

Reliability is the measure of whether the results or assessments derived from an instrument are the result of chance. When an instrument is proven to be reliable, it can be used at different times, in different contexts with high confidence that the presiding conditions did not affect the results with any statistically significance. Reliability is usually proven with a test/retest procedure within a ten-day period. The longer the period, the more reliable the instrument is said to be.

Reliability: Study A

This study was conducted by John Davis, Ph.D., Glenn Graber, Ph.D., and Leon Pomeroy, Ph.D.

A population of 86 students at the University of Tennessee was given the Hartman Value Profile. Ten weeks later, the same students were again given the HVP. That the Hartman Value Profiles were given ten weeks apart with the subjects completing a medical ethics course in the interim added to the rigorousness of this testing of the stability of the Hartman Value Profile.

The results of the study prove the reliability and stability of the Hartman Value Profile. All forty dimensions measured were statistically the same between the first and second trials. “The reliability of the Hartman Value Profile was especially noteworthy in the most complex dimensions: value quotients, balance quotients, self quotients, integration scores, and differentiation scores.” These more complex dimensions all had confidence above 99% with $p < .01$.

Reliability: Study B

This study was conducted by Wayne Carpenter and Edward Martin of Values, Inc., 1987.

A sample size of 200 adults was assembled from persons who either worked for or were applying for work with the Dollar General Corporation. These subjects took the Hartman Value Profile over a three-year period. This length of time for a test/retest would demonstrate superior stability. Value, inc. conducted two analyses of the results:

1. the raw scores themselves
2. the evaluated scores according to Hartman’s scoring scheme

The results of both analyses provided a highly significant level of confidence: $p < .001$. The evaluated scores were analyzed using the Spearman Rank Order Correlation Analysis. For this study a rank order coefficient $> .549$ was all that was needed to secure a $p < .001$. The final rank order coefficient was .974, indicating **“an extremely high level of significance and confidence in the reliability of the instrument, which is far greater in significance than provided by a $p < .001$.”**

CONSTRUCT VALIDITY

Construct validity measure whether an instrument in both its forms and results is consistent with the theory behind the instrument. In this case the measure will be to see if the ranks assigned the statements in the Hartman Value Profile (which for Hartman have fixed, universal order of value) provide support for the validity of Dr. Hartman's constructs.

This study was conducted by The Institute for the Study of Human Value (Dr. Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald), and funded by a grant from the Dollar General Corporation, 1987.

The sample size was 6,354 persons. Analysis was of the profile as a whole, the compositional items(18), the transpositional items (18), and each individual item. The null hypothesis were, "that the ranking of all items would be random, that the compositional and transpositional items would be ranked randomly, and that the normative rank and median obtained rank for each item would be zero."

The results of the test as a whole, using Friedman's Two way ANOVA by rank, Page's Test for Ordered Alternative, and Kendall's Coefficient of Concordance provided a 99% confidence level that the rankings did match the theoretical order of value. The Spearman Rank Order Correlation also provided a statistically significant indication that a correlation exists between the rank order of the model and the rank order of the obtained rankings.

"The results obtained support the contention that the Hartman Value Profile provide a valid description and explanation of the structure and dynamics of human value and human value judgements."

CONCURRENT VALIDITY

Concurrent validity is the test as to whether a particular instrument correlates significantly to other valid measures. This validation provides an alternative means of validating an instrument by “piggy- backing” on the reams of validation of previously benchmarked, psychometric instruments.

This study was conducted by Leon Pomeroy, Ph.D. and John Davis, Ph.D, 1982.

This study incorporated six different psychological instruments as measuring rods to establish concurrent validation. The instruments were the MMPI, the Cattell 16PF, the CAQ, Ellis’s Personal Belief Inventory, the Cornell Medical Index, and the Auto Lethality Index. This study was completed in two phases over a period of more than a year. The first study had a sample size of 68 adults and compared the Hartman Value Profile with the MMPI, ALI, CMI, and the PBI. The second study had a sample size of 72 adults and compared the Hartman Value Profile to the 16PF and the CAQ.

The results of this two-part study are very comprehensive and can be summarized in the following manner:

Part I: The Hartman Value profile correlated with a high degree of significance ($.05 > p < .0001$) in thirty-six different specific measurements to the MMPI, CMI, ALI, and PBI.

Part II: The Hartman Value Profile correlated with a high degree of significance ($< .05 p < .0001$) in thirty-two different specific measurements to the 16 PF and CAQ.

Dr. Pomeroy concluded: **“These data clearly establish a concurrent validity for the Hartman Value Profile...and that the Hartman Value Profile is a valid measure of various stress states that produce problems in living.”**

CONSTRUCT AND CONCURRENT VALIDATION

This joint construct and concurrent validation study determines both the individual and comparative validity of the instrument. Because the Hartman Value Profile is axiological in nature and therefore has more robust and useful applications than psychological instruments, it is necessary to insure its axiological validity by validating it against benchmark axiological instruments.

This study was conducted by Drs. John Austin and Barbara Garwood, 1976.

This study incorporated three different values instruments as measuring rods to establish concurrent validation. The instruments were the Rokeach Value Survey (RVS), the Allport-Lindzey Study of Values (AVL), and Kohlberg's Theory of Moral Development (KMD). The population was comprised of 65 university students with an average age of 23.5 years.

The results were obtained by using the nonparametric Median test of the significance of differences between the number of persons in two more subgroups that scored above and below the median. The study indicated that the expected and obtained mean rankings was significant with a correlation of .95. For the compositional vs. transpositional items the confidence is highly significant with a $p < .001$. The individual items test indicated that no significant difference existed among the individual items ($p = .911$).

The findings of this study prove that the Hartman Value Profile measures what it claims to measure and that it is a valid axiological instrument.

Drs. Austin and Garwood presented this study and these findings at the National Association of School Psychologist Convention, March, 1977.

Business Necessity

The E.E.O.C. requires that any instrument used in candidate selection must be able to prove “business necessity”:

That it measures those traits and/or abilities that directly relate to what is needed to do the particular job.

When an instrument has either predictive validity or criterion validity it fulfills the business necessity requirement.

PREDICTIVE VALIDITY

Predictive validity is a measure of an instrument’s precision and usefulness in being able to predict whether given individuals will be successful, prior to the person’s working in that position or acting in that specific role. It follows the process of predicting a person’s future success in a particular job or position based on his/her test scores. This validation provides a foundation for using an instrument as both a candidate screen and a guide for training and managing employees in specific roles.

CRITERION VALIDITY

Criterion validity is a measure of the ability of an instrument to correspond to specific criteria or behaviors. This type of validation compares groups and analyzes the differences measured between the groups. When the analysis is statistically significant, then that instrument is a valid tool for distinguishing the characteristics that separate the members of those two groups.

PREDICTIVE VALIDITY

This study was conducted by Dr. Robert K. Smith, and Virginia G. Harvey, Ph.D., 1996.

The study sample was 78 individuals seeking employment to manage independently operated retail outlets. Of the 78 candidates, 51 were hired and placed into management positions. While none of the 78 was excluded based on the results, all of the candidates' were categorized according to risk as a manager: low, medium and high.

At the end of the three-year study, the managers were defined to have been successful if they had successfully started and operated their own stores. Failure was defined as having not run their own stores profitably, having been fired for just causes, or having quit for any reason.

<u>Risk Score</u>	<u>Number Hired</u>	<u>% Successful</u>
LOW	20	90
MODERATE	26	65
HIGH	5	0

The results prove that “the overall risk scores determined by the Hartman Value Profile were found to be *highly predictive* of successful employment, at the $p < .0035$ level.”

The Hartman Value Profile is a valid and very useful instrument for establishing predictive indicators of success in business applications. This predictive validation proves that the Hartman Value Profile fulfills the EEOC requirement of business necessity.

CRITERION VALIDITY

Customer Service

For the following customer service study all of the members of samples groups were employed as customer service personnel. They were distinguished as those who were successful from those who were not successful in customer service. The objective criterion for distinguishing these people were letters of commendation from satisfied customers and management's recognition of the person's success in this role.

Sales

For the sales study, the sample was divided into three groups, non-sales persons, moderately successful sales persons, and very successful sales persons. The objective criterion to separate the sales groups was commissions earned for the three previous years.

Management

The first management study compared managers who had succeeded with managers who had failed in the Sara Lee Corporation outlet stores. The second and third management studies compared those who had advanced into management positions with those who had not advanced into management positions.

Customer Service Criterion Validity

This study was conducted by Dr. Robert K. Smith and Virginia Harvey, Ph.D. and commissioned by James River Corporation, 1990.

A study sample of 41 customer service personnel working for James River Corporation. The criterion used to distinguish one group from the other was success in the customer service role. The sample was divided into two groups: those who had been both commended for their service by customers and had been recognized by their colleagues within the company for their exemplary customer service, and those who had neither been commended by their customers nor their colleagues.

The marketplace distinguishes consistently good performers from mediocre and bad performers. This study measured the differences between those two groups as they functioned in customer service roles. General observations would lead one to conclude that those who are exemplary are better able to find practical solutions, communicate with others, instill confidence in their ability to perform, and be able to be persistent without being stubbornly insistent. To confirm the validity of the Hartman Value Profile, these abilities would have to be distinguished by statistically significant differences in the dimensional scores of measuring common sense, personal competence, and personal duty (E1, E2, and S2).

The results confirmed that those who were exemplary in customer service had greater abilities in all dimensions measured by the Hartman Value Profile and statistically higher abilities to reason in the three dimensional areas noted above (noted by * in the following chart).

	<u>% Higher of Excellent</u>	<u>p value</u>
Empathy	17%	.19
Common sense	21%	.02*
Logical solutions	15%	.18
Self esteem	13%	.26
Personal competence	30%	.05*
Personal duty	17%	.07*

This study proves that the Hartman Value Profile scores correlate directly to behaviors, abilities, and attitudes that are required for excellence in customer service.

Sales Criterion Validity

This study was conducted by Value, Inc. (Wayne Carpenter and Edward Martin) and Tim Garton & Associates, 1987.

The study sample was 237 persons with 137 being sales persons from the insurance and estate planning industry. The criteria for distinguishing these persons into three groups was:

100 non-sales persons randomly selected from a database of more than 5,000 general employment candidates.

87 sales persons earning commissions between \$50-100K/yr. For a 3-year period: labeled moderately successful.

50 sales persons earning commissions between \$100-500K/yr. For a 3-year period: labeled successful salespersons.

The methodology of analysis was the variance test resulting in an F ratio because of the three sample populations. Decision rules on interpreting the F ratio were values of 2.00 and above for a .05 level significance and 4.00 and above for a .01 level significance. For variables not deemed significant in the ANOVA test, the Kruskal-Wallis test was applied.

The hypothesis was that those who were successful would have a statistically higher “ego-drive,” “empathy,” and abilities in six other dimensional areas that the Hartman Value Profile measures.

<u>Area Measured</u>	<u>Statistical Significance</u>
Intuitive Insight (DimI1)	p<.01
Common Sense (DimE1)	p<.01
Realistic Goal Setting (DimS1)	p<.01
Self Esteem (DimI2)	p<.01
Self Confidence (DimE2)	p<.01
Self Control (DimS2)	p<.01
“Ego-drive” (I2/E2/S2 Val & Dims)	p<.01
“Empathy” (I1Dim & Valence)	p<.01

This study confirmed that the Hartman Value Profile does distinguish behaviors necessary for excellence in sales.

Management Criterion Validity

This study was conducted by Dr. Robert K. Smith in conjunction with the Sara Lee Corporation, 1990-92.

A sample of 150 managers of Sara Lee outlet stores was given the Hartman Value Profile in the Fall of 1990. All participants had been identified as qualified for management and had been managers of their respective stores for fewer than two years. They were given the Hartman Value Profile as part of their ongoing management training and education.

Two years later, in the Fall of 1992, the head of this division of Sara Lee divided the list of names from the three groups (excellent, good, and failures). The criteria he used to distinguish the excellent managers from the good managers were” operations, sales, turnover, and ability to function within budget. At that time, Sara Lee had an annual management assessment program (completed by peers, subordinates and corporate management) which scored all managers on a numeric scale. These scores provided further distinctions by which the excellent manager (28) were distinguished from the good managers (79). Managers who were identified to be failures (43) had been removed or had quit from their positions prior to the Fall of 1992. They had failed for various reasons ranging from an inability to effectively lead and manage people, an inability to effectively and efficiently oversee operations, and an inability to plan and effectively execute those plans.

The results of this study are based on the differences between the excellent managers and failures. In this particular case, the unusual feature is that all participants (the excellent, good and failures) had been selected by management in 1990 as capable store managers. The profile scores that were compared are those from the testing completed prior to fall, 1990.

The final conclusions were reached by comparing the dimensional scores of the two groups. Previous management studies had shown that different personality types are able to function effectively in management roles. This was confirmed by this study, as well, in that the differences between the two groups were not those that manifest personality characteristics as much as they were those that manifest differences in functionality:

A better ability to work with and be patient with people
(Excellent were 18% more empathic with a
valence of I1 of 54% positive vs. 54% negative),

a greater tendency to work with others than do it herself
(Excellent were 53% more inclined to delegate
with a E1 valence of 28% vs. 43% positive),

a greater tendency to be proactive rather than reactive
(Excellent were 17% more planning oriented
with S2 Dim of 11 vs. 13),

greater personal courage (resulting in less defensiveness)
(Excellent had 42% healthier self-esteems with
and I2 Valence of 25% vs. 16% positive),

and greater resiliency when under stress
(Excellent were 50% better able to function in
stressful situations with BQRs of 1.1 vs. 1.65).

All of the differences noted above are statistically significant with a $p < .05$.

This study confirms that the Hartman Value Profile scores correlate directly to behaviors, abilities, and attitudes that are confirmed by the marketplace as crucial distinctions between those who succeed in managing a retail store from those who do not.

Management Criterion Validity (Study B)

This study was conducted by Dr. Robert K. Smith, 1993.

A sample of 257 managers from eight different companies was given the Hartman Value Profile between 1988 and 1993. All participants were in management positions when they took the profile. They were given the Hartman Value Profile as part of their ongoing management development.

The sample was divided into three groups: excellent managers, good managers, and poor managers. The criteria used to distinguish the excellent managers from the good managers were: superlative operations in their respective fields, effectiveness with their people, lack of turnover, and ability to function within a budget. All were also assessed by their peers, subordinates and superiors who identified them as excellent (70), good (100), or poor (87). In order for a manager to be identified as poor, s/he had to have ongoing unresolved problems, glaring ineffectiveness with her direct reports, or failures within business contexts in which others were succeeding.

The results of this study are based on the differences between the excellent and poor managers. The final conclusions were reached by comparing the dimensional scores of these two groups. Previous management studies had shown that different personality types are able to function effectively in management roles. This was confirmed by this study, as well, in that the differences between the two groups were not those that manifest personality characteristics as much as they were those that manifest functional capability. The poor managers did not score higher than the excellent managers in any dimension. The excellent managers were statistically superior to the poor managers in the following dimensions:

A better ability to work with and be patient with people
(Excellent were 26% more empathic with a
I1 valence of 59% vs. 43% positive),

A greater tendency to work with others than do it herself
(Excellent were 25% more inclined to delegate
with an E1 valence of 32% vs. 44% positive),

greater personal courage (resulting in less defensiveness)
(Excellent had 13% healthier self-esteems
with I2 Dim of 11 vs. 13),

and a greater degree of reasonability when confronted
(Excellent were 18% more reasonable and less
stubborn than the poor managers were with an
S2 dim and 12 vs. 14).

All of the differences noted above are statistically significant with a $p < .05$.

This study confirms that the Hartman Value Profile scores correlate directly to behaviors, abilities, and attitudes that are confirmed by businesses as critical distinctions between those who succeed in management from those who do not.

Management Criterion Validity (Study C)

This study was conducted by Kinsel Enterprises, Inc. (Dr. Robert K. Smith and Ken Bandy), 1996.

120 women in business were given the Hartman Value Profile from 1987 to 1991 as part of their ongoing training and development. They came from more than 20 different companies in 6 different states. Their ages ranged from mid-twenties to mid-fifties.

The sample was divided into two groups, those who were executive, currently serving in management roles in their companies (20), and those who were not in management roles (100).

The results of this study are based on the differences between the managers and non-managers. The final conclusions were reached by comparing the dimensional scores of the two groups. This study confirmed that the differences between the two groups were dramatic and significant in five areas. The non-manager group did not score higher than the managers in any category.

A greater ability to make decisions and use common sense
(Managers were 23% clearer in their decision making and common sense judgment with a Dim E1 of 7.25 vs. 8.9)

Greater personal courage (resulting in less defensiveness)
(Managers had 20% healthier self-esteems with an I2 Valence of 22% vs. 19% and Dim of 10.1 vs. 12.5),

A greater ability to make accurate self-assessments of their own strengths, limitations, and competencies.
(Managers were 12.5% clearer and more accurate in assessing their own abilities and roles with a Dim E2 of 12.75 vs. 14.25),

And a greater degree of personal freedom to make mistakes, risk loss, and shift one's own priorities.
(Managers were 13% more reasonable and less dogmatic than the non-managers were with a Dim S2 of 11.5 vs. 13.8)

All of the differences noted above are statistically significant with a $p < .05$

This study proves that the Hartman Value Profile scores correlate directly to behaviors, abilities, and attitudes that are confirmed by the marketplace as the significant distinctions between women who are not promoted into management positions and those who are not promoted.

Criminal vs. Non-Criminal Study

This criminal vs. non-criminal validation compares convicted criminals with the normal population and analyzes the differences between these two groups. When the analysis is statistically significant, then that instrument is a valid tool for distinguishing the characteristics that separate criminals from non-criminals.

For this study we assume that the judicial system of the State of Tennessee is a sound criteria selector in distinguishing violent criminals from the rest of the population. Criminals in general are people whose behavior stems from their inability to call upon strengths to overcome their weaknesses. Non-criminals are people who can and do rely on their strengths to overcome or to “hold in check” their weaknesses. To establish the validity of the Hartman Value Profile, an analysis of the profiles of the criminals and non-criminals should present a significant difference in their capacities to reason and function effectively in stressful situations.

This study was conducted by Drs. Mark Moore and Phil King, 1994.

The study included 44 convicted criminals serving their sentences at Brushy Mountain State Prison, the maximum-security state prison for the State of Tennessee. These criminals took the Hartman Value Profile while serving time for murder or violent rape. The normal population profiles were gathered from Dr. Moore’s database of more than 500 functioning people, from all walks of life, throughout the United States. The null hypothesis was that no significant difference would exist between convicted criminals and the general population.

A summary of the results for the six key measures of the Hartman Value Profile (using Dr. Hartman’s transfinite scoring methods [the lower the number the greater the capacity and ability to reason and function effectively in stressful situations]):

Capacities to	Criminal	Non-Criminal
Empathize (I1)	11.85	8.42
Reason Practically (E1)	14.76	9.08
Reason Logically (S1)	17.43	13.63
Value One’s Self (I2)	18.26	11.45
Compare One’s Self (E2)	19.02	14.30
Define One’s Self (S2)	17.80	13.49

A summary of the results for the same six key measures of the Hartman Value Profile using Dr. Moore’s vector analysis scoring method are (the higher the number the greater the capacity and ability to reason and function effectively in stressful situations):

Criminal vs. Non-Criminal Study-Continued

Capacities to	Criminal	Non-Criminal
Empathize (I1)	4.86	7.44
Reason Practically (E1)	2.68	6.94
Reason Logically (S1)	0.67	3.53
Value One's Self (I2)	0.05	5.16
Compare One's Self (E2)	-0.52	3.03
Define One's Self (S2)	0.40	3.63

For both scoring methods, the differences are statistically significant with a $p < .05$.

This study is significant in that it establishes a high statistical difference between people who are able to be effective in society from those who are unable to do so. It provides an objective, resultant-behavioral criterion against which the scores are compared. In as much as few people will ever have cause to encounter or profile murderers or violent rapists, this study does confirm that the Hartman Value Profile accurately measures a person's capacity to value by assessing people at the severely dysfunctional end of the behavioral spectrum.

CONCLUSION

The theory behind the Hartman Value Profile is subject to scrutiny and testing as are all other scientific theories. Based on observations about the nature of our world, the scientist posits principles that define and categorize those observed behaviors or characteristics. Then a mathematical system with the same properties is associated to that system. That mathematical system is then able to model that world, without the scientist actually entering that world. This is why engineers on earth can design a ladder that will work on the moon. This establishing a theory and finding a mathematical system that has an isomorphic relationship to that theory is what Dr. Robert S. Hartman did from 1945 through 1973 in his discovery of formal axiology. One practical result of that work was the Hartman Value Profile. Dr. Hartman was nominated for the Nobel Peace Prize in 1973 because of the conclusions he reached using formal axiology.

Once a scientific theory is defined, the proofs of the theory are based on its consistency and ability to be applied to all relevant aspects and its consistency with previously proven tenants. This is why a physicist does not have to fly a plane or observe planes to be able to design one that flies. He mathematically models the flights of a large airplane by using previously proven formula of flight to model the new plane. He then proves his design (and thus the theories, as well) by having the actual plane fly.

The cornerstone axiological instrument is the Hartman Value Profile. The formulation of the Profile came from its consistency with previously established tenants. This was demonstrated by the middle three studies in this compendium. The proof comes in the validity and reliability of axiological instruments to real life, which was demonstrated by the final eight studies. **These studies, spanning 15 years, being completed by 19 individuals, validate the tenants of formal axiology and prove that the Hartman Value Profile is reliable, is valid, complies with the EEOC requirements, and is useful in multiple applications for industry and social sciences.**

VALUES

Validation Study

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Personal Interests, Attitudes, Values 2

To: Target Training International, Ltd.

From: Peter T. Klassen, Ph.D.
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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 α 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 21st 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	
Valid	1130	1130	1130	1130	1130	1130	
Missing	0	0	0	0	0	0	
Mean	44.15	50.13	30.23	45.88	43.60	38.01	
Std. Error of Mean	.28078	.31522	.30616	.29234	.25971	.32800	
Median	44	50	29	47	44	37	
Std. Deviation	9.4387	10.5963	10.2916	9.8273	8.7303	11.0259	
Minimum	19	16	12	15	19	14	
Maximum	72	72	66	71	65	68	
Percentiles	10	32	36	18	33	32	25
	20	36	41	21	37	36	28
	30	39	44	24	41	39	31
	40	42	47	26	44	42	34
	50	44	50	29	47	44	37
	60	47	53	31	49	46	40
	70	49	57	35	51	48	44
	80	52.	60	39	55	51	48
	90	56	64	44	58	55	54

Revised Scale Reliability

Scale reliabilities were calculated using Cronbach's Alpha (α). Cronbach's α 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 α is bounded from 0 to 1. In general an α 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 α 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 α 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 α 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.

Submitted by:

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BEHAVIOR

Validation Study

Style Insights – DISC, English version 2006.g

To: **Bill Bonnstetter**
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From: **Peter T. Klassen, Ph.D.**
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Date: **12 May 2006**

Summary

*A continual quality improvement process initiated in 2002 utilized a series of examinations of scale and item reliabilities across multiple populations of respondents to culminate in this 2006.g **Style Insights** instrument. The following assessment of the **Style Insights** is based on samples drawn from a population of 75,317 responses. These data are from respondents actively using this instrument through multiple applications. The results of assessment of this revised edition indicate reliability for the two dimensions (adaptive, natural) of four parallel scales (D, I, S, C) ranging from .64 to .80. Correlations between adaptive and natural scales indicate that these two dimensions of parallel scales are highly related, as one would expect, but also that the scales are sufficiently independent measures to justify separate interpretations and comparisons. Scores on the scales are distributed across a wide range of scale points, which supports making comparison between individuals and the self-reported behaviors in a population. This version of the instrument includes updating the population distributions. These norms anchor comparisons in a population distribution representative of the 21st century. Overall, the **Style Insights** is a strong, reliable instrument applicable across a variety of populations.*



Background

TTI's Style Insights - DISC English version 2006.g is anchored in design and development of their prior DISC instrument. During the late summer of 2002, Target Training International, Ltd. initiated a process of continual review of the reliability of the eight scales and the associated items. The following assessment of the **Style Insights - DISC** English version 2006.g is based on 75,317 responses received between 1 March 2005 and 28 February 2006. These data contain 45.4% female and 54.6% male responses that are representative of individuals actively using this instrument through the multiple applications.

The **Style Insights** instrument contains ninety-six (96) phrases organized in twenty-four frames of four items each. Each frame contains descriptive items associated with each of the four scale constructs. Respondents select a forced choice of “most-like” and “least-like” themselves. Two dimensions of four scales are constructed from these responses. The two dimensions are adaptive and natural.

The importance and utility of the two dimensions of scales are discussed later. The four scales are labeled as “Dominance-Challenge,” “Influence-Contact,” “Steadiness-Consistency,” “Compliance-Constraints.”

Scale reliabilities and item cohesion to its assigned scales were examined for samples from the response-populations. During prior assessments, a factor-analysis on the items confirmed the continuity of the scales as constructed. Based on analysis of all 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 **Style Insights** instrument was, prior to release, subjected to several rounds of field-testing, further editing and confirmation of revisions. Once again several different responding-populations were utilized. The current release confirms increased reliability in each of the scales, and improves independence between the S and C scales.

The process of scale revisions mandated an updating of population distributions used as norm references. This process changed the reference point for comparison of style from its historic point of development up to the 21st century with recognition of changing behaviors and social expectations.

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, **Style Insights** – DISC English 2006.g version, utilize a 75,317 respondents compiled from users of the instrument. The sample represents a variety of individuals making use of the instrument in a variety of settings.

	AD6g	AI6g	AS6g	AC6g	ND6g	NI6g	NS6g	NC6g
N	75317	75317	75317	75317	75317	75317	75317	75317
Mean	6.01	5.61	5.76	4.94	-7.48	-4.62	-3.8	-7.16
Std. Error of Mean	0.015	0.014	0.013	0.012	0.016	0.013	0.01	0.014
Median	5	5	5	5	-7	-4	-3	-7
Std. Deviation	4.18	3.849	3.502	3.242	4.416	3.525	2.693	3.79
Sex: Female, 45%	AD6g	AI6g	AS6g	AC6g	ND6g	NI6g	NS6g	NC6g
Mean	5.27	6.26	6.33	4.43	-8.47	-3.86	-3.43	-7.42
Std. Error of Mean	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02
Median	5	6	6	4	-8	-3	-3	-7
Std. Deviation	3.90	3.99	3.60	3.07	4.56	3.22	2.61	3.91

Sex: Male, 55%	AD6g	AI6g	AS6g	AC6g	ND6g	NI6g	NS6g	NC6g
Mean	6.62	5.07	5.29	5.36	-6.65	-5.24	-4.11	-6.95
Std. Error of Mean	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02
Median	6	4	5	5	-6	-5	-4	-7
Std. Deviation	4.31	3.64	3.34	3.32	4.11	3.64	2.72	3.67

Revised scale reliability

Scale reliabilities were calculated using Cronbach's alpha (α). Cronbach's α is considered the most appropriate statistical test for reliability, given the dichotomous responses used to construct the scales. For dichotomous data, this is equivalent to the Kuder-Richardson formula 20 (KR20) coefficient. These statistics model internal consistency, based on the average inter-item correlation. These evaluations are a more rigorous approach than a traditional split-half statistic. Cronbach's α is a statistic bounded by 0 to 1. In general an α 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 SA1 reliabilities and Cronbach's α from the 2006.g data that were utilized to set the distribution profile for the revised SA2 scales. Most of the scale reliabilities have improved substantially. These findings document the revised SA2 as an instrument with solid scale construction and reliability.

Cronbach's Alpha – Scale reliability: 2006.g Sample N = 704								
	Adaptive D	Natural D	Adaptive I	Natural I	Adaptive S	Natural S	Adaptive C	Natural C
SA1	0.77	0.81	0.62	0.69	0.65	0.62	0.54	0.58
SA2.2006 e	0.804	0.801	0.777	0.777	0.750	0.628	0.707	0.746
SA2.2006.g	0.804	0.801	0.787	0.785	0.754	0.639	0.713	0.758

Scale relationships -- Correlations

Examination of the relationship among the scales focuses on two issues. First, the relationship of the “adaptive” scales, based on respondents' selection of “most like” phrases and the “natural” scales based on selection of “least like” phrases, has a theoretical foundation. While some may argue that the DISC scales are strengthened by simply combining these two dimensions, examination of the following correlation table supports my conclusion that these two dimensions measure subtle, but important differences. Correlations between same scale adaptive and natural values range from .65 to .79. Based on observations made across each of response-populations, I judge that there is strong support for concluding that the natural scales are less prone to social desirability biases and variation due to the setting, environment, and responders' expectations.

A second issue worth noting is that of an increased independence between the S and C scales. The common variance in between the

natural S and natural C is 18%, and the common variance between the adaptive S and adaptive C reduced to 2%.

Spearman's Rank Order Correlations		AD6g	AI6g	AS6g	AC6g	ND6g	NI6g	NS6g
AD6g	Correlation Coefficient	1						
	Sig. (2-tailed)							
AI6g	Correlation Coefficient	-0.1091	1					
	Sig. (2-tailed)	0.00						
AS6g	Correlation Coefficient	-0.7010	-0.2225	1				
	Sig. (2-tailed)	0.00	0.00					
AC6g	Correlation Coefficient	-0.2195	-0.6832	0.1452	1			
	Sig. (2-tailed)	0.00	0.00	0.00				
ND6g	Correlation Coefficient	0.7901	0.0320	-0.6733	-0.2737	1		
	Sig. (2-tailed)	0.00	0.40	0.00	0.00			
NI6g	Correlation Coefficient	-0.0126	0.7330	-0.1872	-0.6409	-0.0024	1	
	Sig. (2-tailed)	0.74	0.00	0.00	0.00	0.95		
NS6g	Correlation Coefficient	-0.6267	-0.2252	0.6541	0.2819	-0.6888	-0.3459	1
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	
NC6g	Correlation Coefficient	-0.4049	-0.5993	0.4191	0.7117	-0.5255	-0.6802	0.4196
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Conclusions

I've reached the following conclusions with reference to TTI's *Style Insights* 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 all scale points to make interpretations and comparisons between respondents meaningful when interpreted as comparisons of individuals to distributions of these self-reported behaviors in a population.
- The items tend to co-vary around consistent latent-construct indicators of the theoretical concepts represented by instrument descriptions.
- The eight scales are constructed from coherent items with a solid reliability as indicated by Cronbach's α ranging from .6 to .8.
- The revisions presented in SA2 improve scale and item reliabilities significantly.
- The two dimensions of “adaptive” and “natural” contain parallel scales that are consistent with each other, but that also represent substantial potential for meaningful complimentary interpretation.
- The instrument is referenced in current populations, thus anchoring comparisons in the 21st century.

With continued assessment and review of TTI's *Style Insights*, this revision confirms TTI's commitment to a process of continual quality improvement.

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12 April 2006