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Axiometrics International, Inc.

Presents:

Validity Studies
Of
The Hartman Profile Model

Introduction to Axiometrics International, Inc. A*i*

Axiometrics International, Inc. (**A*i***) is headquartered in Nashville, Tennessee. The company was founded as a result of the acquisition of the marketing and distribution rights of the Carpenter Profile System (based on The Hartman Profile) from Value Resource Group and Wayne Carpenter. The company performs employee testing and developmental analysis for a wide range of companies including Fortune 500 companies as well as smaller businesses. Unlike other assessment instruments that are based on interpreted behavior, our product is centered on the fundamental principals of the science of Axiology.

Axiology is not subject to the speculation of an interpreted behaviorist, but is derived from scientific, mathematical equations that have been proven thousands of times. Furthermore, it does not care about age, sex or race and is cross cultural, meaning the deployment can be made anywhere in the world without bias.

A*i* is able to adapt its software to different business applications, as well as personal development and coaching. These products can be applied to various situations to allow companies and individuals the ability to make decisions based on data that has not been readily available before now.
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The mathematical backbone of this axiological science has been validated and proven over the past ten years through extensive testing. Tests were completed with the assistance and cooperation of top Fortune 500 companies. Enclosed is a summary of those validation studies.

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Introduction

Dr. Hartman constantly reminded his students, "The proof of the pudding is in the eating." In other words, regardless how logical, rigorous or beautiful a system of thinking might be, if the system does not provide usable and testable results, then it does not have the right to be called a science. There are four keys to a science.

 A science is:

1. Based on objective observations, which are independent of any one subject's perspective.
2. Based on a mathematical measuring system.
3. Universally applicable.
4. Subject to empirical testing to confirm the observations.

As a result, the applications of science must be valid and reliable.

The science of axiology, founded by Dr. Hartman, meets all four of these conditions. The science is based on formal value theory generated by Hartman's value mathematics. The Hartman Value Profile (HVP) is an application of Dr. Hartman's axiology. As such, it is based on value mathematics. Moreover, the norm for the profile is generated prior to statistical evaluation of profile responses and results from the logical relations of the value system.

The primary task of the value scientist is to establish the validity of the Hartman Norm as a measure of reality and to substantiate the reliability of the instrument. Value Resource Group has participated in a variety of research projects to validate The Hartman Value Profile, substantiate the reliability of the test instrument, and demonstrate the usability of the results from the profile. In addition, other value scientists—Axiologists—have conducted studies to examine and confirm the validity of the HVP.

Standard statistical validation consists of three types of validation studies: construct validity, concurrent validity, and criterion validity. Construct validity examines the instrument itself and determines that all of the items on the instrument are relevant and have the prescribed effect on the area or concept that they measure. In other words, does the profile measure what it is supposed to measure? Concurrent validity is obtained by correlating an instrument to other industry-accepted instruments. Criterion studies demonstrate that the instrument can be used as a valid predictive measure within a specific application or discipline.

Confirmation studies in all three of the major areas of validation have been conducted, both internally by axiologists and psychologists at Value Resource Group, and externally by scientist and statisticians outside Value Resource Group. In addition, internal and external studies have been conducted to confirm that The Hartman Value Profile and its results are reliable and do not discriminate either by age, race, or sex.

This report is a summary of some of the key studies that have taken place to date. First, the report examines The Hartman Model to provide a brief introduction to the components of Hartman's Value Mathematics as it applies to the HVP. Next, the report examines the results of a series of validity studies that provide strong statistical confirmation that Hartman's model is in fact a real and accurate interpretation of the way we make value judgments.

The Hartman Model

According to Dr. Robert S. Hartman's system for measuring "value," value is a phenomena or concept, and the value of anything is determined by the extent to which it meets the intent of its meaning. For example: a chair that has all of the natural properties contained within the definition of chair is by definition a "good chair." A chair that has only a few of the natural properties contained within the definition of a chair is by definition a "less than good" or "not as good" chair, a fair chair, a poor chair, etc.

A "good chair," according to Hartman, fulfills the intention of its definition. Given that premise, Hartman's theories set forth a system of mathematics to establish and prove the accuracy and utility of his theories.

Hartman discovered that every concept has three dimensions and that every concept has the following types of value:

1. The value of its uniqueness.
2. The value of its function or role.
3. The value of its meaning and purpose.

These three "Dimensions of Value" are referred to as the following concepts:

1. Intrinsic Value
2. Extrinsic Value
3. Systemic Value

Hartman's model objectively measures the relative clarity and level of development of each of these value dimensions. For Hartman, this measures the structure and dynamics of a person's value system relative to each unique concept being measured.

In addition to measuring value and personal value systems, the Hartman system measures a person's value judgments—their valuations. According to Hartman, when a person makes a judgment about any conceptual phenomena, they make judgments in terms of value combinations within and between dimensional sets.

For example, the three Value Dimensions outlined above can be combined in 18 different ways when one is making a value judgment.

Consider the concept "wife." The intrinsic value of "wife" is a wife's value resulting from being a unique, one-of-a-kind, authentically original individual.

"Wife" has value because she is unique. This uniqueness constitutes her INTRINSIC value. However, what happens when we make a value judgment about "wife"? What are our options?

The value is: the uniqueness of wife.

When making a judgment about a wife's uniqueness, I can:

Value the Intrinsic Value Intrinsically	=	I love my wife's uniqueness.
Value the Intrinsic Value Extrinsically	=	I enjoy my wife's uniqueness.
Value the Intrinsic Value Systemically	=	I find my wife's uniqueness meaningful.
Disvalue the Intrinsic Value Intrinsically	=	I hate my wife's uniqueness.
Disvalue the Intrinsic Value Extrinsically	=	I dislike my wife's uniqueness.
Disvalue the Intrinsic Value Systemically	=	I think my wife's uniqueness is crazy.

The Value Dimension of the concept "wife" that I am making value judgments about is her INTRINSIC VALUE.

There are at least six different value judgments or evaluations I can make about her INTRINSIC VALUE.

I can make the same six judgments for the EXTRINSIC and SYSTEMIC Dimensions of Value.

By combining the INTRINSIC, EXTRINSIC, and SYSTEMIC judgment combinations, there are 18 different evaluations about the value of "wife" that can be made.

The fascinating discovery that Hartman made was that the 18 valuation possibilities are not made randomly, because their relative value is not relative in nature. The relative value of each judgment is built into the structure and dynamics of the conceptual system that generates decisions.

As a result of Hartman's research, he discovered that the relative value of each one of the 18 valuation possibilities is different and that the hierarchical arrangement of their relative value is constant across concepts. He demonstrated that the relative value of the intrinsic valuation of the Intrinsic Value is more valuable than any one of the other 17 valuation possibilities, and the intrinsic devaluation of the Intrinsic Value is less valuable than any of the other 17 valuation possibilities. He also discovered that regardless whether one uses symbolic logic, the theory of types, set theory, or transfinite set theory, any quantification of the 18 valuation possibilities would always arrange the items in the same hierarchical order.

Hartman discovered that there is a value norm in the natural universe, in the phenomenal world of concepts. This value norm enables us to objectively measure and study the unique characteristics of the structure and dynamic of any person's value and valuations concerning any conceptual phenomena.

Value profiles based on The Hartman Model measure the deviation of a subject's ranks, given to each of the 18 items in a profile, from the ranks that the model stipulates to each item. The model and its internal logic determine the correctness or incorrectness of an individual's value judgments. The profile measures a person's capacity for making value judgment.

The profile scores (axiological scores) are numerical. The lower the number, the better the axiological score. The higher the number, the worse the axiological score.

Hartman developed a scoring system for measuring the axiological scores that result from the difference between an individual's ranking of the items and the axiological norm.

The first scale consists of four measures:

1. **The Differentiation Score**—for the capacity to differentiate values.
2. **The Dimension Score**—for the sense of proportion, which results from the equilibrium between value dimensions.
3. **The Integration Score**—for the capacity to solve problems and see the relevant in the complex.
4. **The Dissimilarity Score—**for the capacity to distinguish between good and bad.

The second scale consists of the measure of the three value dimensions:

1. **Intrinsic Value**—the capacity for discerning values concerning uniqueness and individuality.
2. **Extrinsic Value**—the capacity for discerning role, function and practicality.
3. **Systemic Value**—the capacity for discerning values concerning meaning, purpose, order and system.

The third set of scales concerns the measurement of the value dimensions. Each of the three value dimensions has a:

- **Dimensional Score**—indicating the capacity for discerning the value dimension in question.
- **Integration Score**—indicating the capacity for problem solving in that dimension.

Using Hartman's axiological profile and scoring systems, we measure, analyze and assess a person's value system and method for making value judgments and translate these measurements into a variety of descriptive and prognostic reports that both describe and make various diagnostic predictions about a person.

Construct Validity Study of the Hartman Value Profile

Value Resource Group has participated in and sponsored several studies concerned with the construct validity of an 18 item inventory designed to measure values placed by subjects within the dimensions of value measured by Dr. Hartman's mathematics. The focus of the studies is the measure of the congruency between the subjects' rank ordering of the 18 items and the Hartman Norm, which is based on his Value Mathematics. Two different studies were performed. One study was an internal study sponsored by Value Resource Group that included 1,777 subjects. The other was sponsored by Dollar General Corporation and was performed primarily by Dr. Chuck McDonald, a forensic psychologist in Nashville, TN, and William Panak, a statistician. This study included 6,354 individuals pulled at random from a database of thousands.

Dr. Hartman's model orders each of the possibilities of a value profile from 1 to 18. Based on this model, a person's value structure consists of three dimensions: intrinsic, extrinsic and systemic. Each of these dimensions is valued from a dimensional standpoint, i.e., the intrinsic valuation of extrinsic value, the extrinsic valuation of a systemic value and the systemic valuation of an intrinsic value, etc. Each value dimension can be valued in three ways: intrinsically, extrinsically and systemically, resulting in a total of nine valuational combinations. In addition, each value dimension can be enhanced valuationally, referred to as a "composition," or diminished valuationally, referred to as a "transposition". As a result, each value profile is composed of nine compositional and nine transpositional items.

The key issue for construct validity is to do large groups of people and order the items in the same way predicted by the model. Value Resource Group conducted studies on both Hartman Value Profile 1, a measure of one's capacities to make value judgments about the world, and Hartman Value Profile 2, a measure of one's capacities to make value judgments about one's self.

The focus of the studies was on three areas:

1. The construct validity of the profile as a whole.
2. The construct validity of the valuational (compositions) and disvaluational (transpositions) items.
3. The construct validity of each of the 18 individual items in the profile.

At the profile level, the studies examined the extent of isomorphism (correlation) between Hartman's model of value structures and the rank ordering of the value profile instruments. The question was whether the applicants would rank the 18 items in an order consistent with Hartman's model, i.e., norm item one ranked lowest on the average and norm item 18 ranked highest, with all other items ordered from lowest to highest norm rank.

At the level of compositional vs. transpositional items, Hartman's model claims that individuals will rank the compositional items with a numerical ranking of 1 to 9, and the transpositional items with a numerical ranking of 10 to 18. In other words, individuals, on the whole, will see "good" items (compositional) as "good", and "bad" items (transpositional) as "bad".

At the level of each of the individual 18 items, the test is whether each item response matches the norm value predicted by the model.

The following summaries will focus on the results of the internal studies performed within Value Resource Group, and the external studies performed by Dr. McDonald both for Hartman Profile 1 (the "world" profile), and Hartman Profile 2 (the "self" profile).

A Study of the Profile as a Whole

The Hartman Model predicts that homogeneous groups of individuals will rank order the value profile instrument in a predictable way. According to Dr. Hartman's model, the 18 valuational items have a fixed hierarchical order of value. Hartman claimed that if one were to objectively assess the value system and value judgments of large samples of humanity, the average obtained rank of all items would match the theoretical order predicted by his system perfectly.

Internal Studies

The Hartman Model predicts that homogeneous groups of individuals will rank order items in a predictable order. To test for this order, Page's "Z" was calculated and compared to critical X values for a one-tailed test. To derive an index of concordance between subjects within each group, Kendall's coefficient of concordance "W" was calculated for the group.

HVP-1 (World Profile)

Results indicate that the isomorphism between the model and the observed sample ranking is quite high (Page's Z = 149.51) and the average correlation between pairs of respondents is excellent (Kendall's W = .81). The rank-order correlation of expected and obtained mean rankings for the 18 items is .96.

HVP-2 (Self Profile)

Results indicate that the isomorphism between the model and the observed sample ranking is also quite high (Page's Z = 143.64) and the average correlation between pairs of respondents is excellent (Kendall's W = .75). Also, the rank order correlation expected and obtained mean rankings for the 18 items is .95.

External Studies

The Hartman Model predicts that homogeneous groups of individuals will rank order items in a predictable order. Data was obtained from 6,354 subjects randomly pulled from a database of thousands.

To test the predictability of the test, the following procedures were used:

- Friedman's Two-Way ANOVA by Rank
- Page's Test for Ordered Alternatives
- Kendall's Coefficient of Concordance
- Spearman's Rank Order Correlation

HVP-1 (World Profile)

The results indicated the following:

- **Friedman's Two-Way ANOVA by Rank**—Friedman's chi-squared = 82479.290, indicating that there is a difference in the ranking of items at the 99.9% confidence level
- **Page's Test for Ordered Alternatives**—Page's L = 12877990.0 and Page's Z = 282.869, indicating that there is a set of items ordered by respondents in a way that supports the model at the 99.9% confidence level
- **Kendall's Coefficient of Concordance**—Kendall's W = 0.764 and Kendall's chi-squared = 82479.290, indicating that there is a significant concordance between respondents at the 99.9% confidence level
- **Spearman's Rank Order Correlation**—Spearman's R = .96, indicating that there is a very strong and significant correlation between rank order of the model and the rank order of obtained rankings.

Hartman's Value Profile 1 (World) demonstrates strong support for Hartman's Model when "overall items" are examined.

HVP-2 (Self Profile)

The results indicated the following:

- **Friedman's Two-Way ANOVA by Rank**—Friedman's chi-squared = 87322.741, indicating that there is a difference in the ranking of items at the 99.9% confidence level
- **Page's Test for Ordered Alternatives**—Page's L = 12877990.012964086.0 and Page's Z = 282.60, indicating that there is a set of items ordered by respondents in a way that supports the model at the 99.9% confidence level
- **Kendall's Coefficient of Concordance**—Kendall's W = 0.808 and Kendall's chi-squared = 87322.741, indicating that there is a significant concordance between respondents at the 99.9% confidence level
- **Spearman's Rank Order Correlation**—Spearman's r = .95, indicating that there is a very strong and significant correlation between rank order of the model and the rank order of obtained rankings.

Hartman's Value Profile 2 (Self) also demonstrates strong support for Hartman's model when "overall items" are examined.

A Study of the Compositional-Transpositional Items

The key to the compositional-transpositional analysis is the question: Do individuals, on the average, rank compositional items ("good" items) as good, and transpositional items ("bad" items) as bad? Compositional items on a value profile have a norm ranking of 1 through 9. Transpositional items have a norm ranking of 10 through 18.

Internal Studies

To test the hypothesis concerning the compositional-transpositional items, raw ranks were recorded so that 0 represented no distortions, e.g., compositional items were ranked as compositions and transpositional items were ranked as transpositions, and a 1 represented a distortion, e.g., a compositional item ranked as a transposition or a transpositional item ranked as a composition. The statistical test used was a 2x2 chi-square test for independence of expected and obtained ranks.

HVP-1 (World Profile)

The results indicated that, averaged across the entire sample, all items were ranked at their appropriate compositional-transpositional level (chi-square = 18.00, p < .001).

HVP-2 (Self Profile)

Again, the results indicated that, averaged across the entire sample, all of the items were ranked at their appropriate compositional-transpositional level (chi-square = 18, $p < .001$).

External Studies

The key in these studies is to identify deviant items, "bad" items ranked as "good" and "good" items ranked as "bad".

Items 1 through 9 - Range of Median Ranks 2 through 8
Items 10 through 18 - Range of Median Ranks 11 through 18

The compositional and transpositional items were split and Spearman's rank order correlation was run on each half.

HVP-1 (World Profile)

The results for the compositional items 1 through 9 were $R^s = 0.84$

The results for the transpositional items 10 through 18 were $R^s = 0.84$

These results indicate that no items in Hartman's World Profile are grossly misconstrued to the point of being seen with a valence opposite of that which is expected under the Hartman model.

HVP-2 (Self Profile)

The results for the compositional items 1 through 9 were $R^s = 0.83$

The results for the transpositional items 10 through 18 were $R^s = 0.98$

Again, these results indicate that no items in Hartman's Self Profile are grossly misconstrued to the point of being seen with a valence opposite of that which is expected under the Hartman model.

Summary Comment on Internal and External Compositional-Transpositional Studies

The studies indicate that, on the average, individuals do not see "bad" items as "good" and "good" items as "bad". Individuals do, in fact, make distortions and these distortions become important when distinguishing them as individuals and when measuring their capacity to make value judgments. The key is that, on the whole, the compositional-transpositional analysis supports Hartman's model that the differences are a measure of reality.

A Study of Individual Items

The two former classes of construct validity studies, evaluation of the profile as a whole, and analysis of compositional-transpositional items, support Hartman's model. This analysis examines how close the individual items are ranked against Hartman's mathematical norm. In short, the studies look for individual items that deviate significantly from their expected rankings. The studies represented in this validity synopsis are the external studies, those done by professionals primarily outside of Value Resource Group, conducted by Dr. Chuck McDonald.

Differences between the obtained sum of ranks of all of the obtained ranks, and differences between the obtained sum of ranks and the model sum of ranks for each of the items were analyzed using critical differences defined by Hollander, Wolf and Daniels.

HVP-1 (World Profile)

Of all possible comparisons between items, at least 89.54% were statistically predicted by the model, 7.4% were not predicted by the model, and 2.61% were in a direction opposite to that predicted by the model.

HVP-2 (Self Profile)

Of all possible comparisons between items, at least 89.54% were statistically predicted by the model, 7.19% were not predicted by the model, and 3.27% were in a direction opposite to that predicted by the model.

In both HVP-1 and HVP-2, even in the differences between predicted ranking sums and actual ranking sums, the order and distribution of the items complies with The Hartman Model.

Summary Conclusions

Regardless of whether one studies the profile (both HVP-1 and HVP-2) as a whole—the compositional or transpositional sets of items, or each of the individual items—the obtained ranks strongly support the validity of Hartman's constructs regarding human value. The construct validity findings both in the internal and external studies lend great confidence that the profile instruments measure a person's basic value structure and the dynamics of their value judgments.

EEOC Studies of the Hartman Value Profile

The fundamental principle underlying Federal Law and Regulation in the United States pre-employment and career assessment practices is as follows:

> "Employer policies and practices which have an adverse impact on the employment opportunities of any race, sex or ethnic group are illegal."
> (EEOC, 1978)

The guidelines issued by the Federal Government cover not only tests, but also any selection procedure that is used as a basis for any employment decision.

> "Employment decisions include, but are not limited to, hiring, promotion, demotion, membership, referral, retention, licensing and certification."
> (EEOC, 1978)

The focus of the EEOC studies for Value Resource Group is whether or not:

- The rank ordering of people, using the Hartman Value Profile, of different sexes, from different racial groups, and at different ages is statistically similar or different.
- The axiological scores resulting from the Hartman Scoring System of different sexes, from different racial groups, and at different ages is statistically similar or different.
- The clinical, interpreted scores of people of different sexes from different racial groups, and at different ages is statistically similar or different.

EEOC studies were performed internally by VRG focusing on the rank ordering of the profile items. EOOC studies were also performed externally for VRG by Dr. Chuck McDonald and sponsored by Dollar General Corporation. The external studies focused on:

- The rank ordering of the items.
- The axiological scores resulting from The Hartman Scoring System.
- The clinical, interpreted scores.

Internal EEOC Studies

These studies were conducted to determine whether The Hartman Value Profile discriminated between males and females, individuals of different age groups, and individuals of different races—specifically "white-black" differences. Two sample populations were chosen for the "male-female" study, the "age" study, and the "white-black" study. These populations consisted of 200 cases in each population chosen at random from a database of approximately 6,000 cases.

The projects analyzed scores based on the Hartman Value Profile and considered the potential significance of differences in scores in the sample populations. The statistical test selected was two-sample, parametric, interval data t-test. Decision rules on interpreting the t-test gave a value of 1.282 and above for a significance of 0.20.

Fifty-four data items, including axiological and clinical measures, were analyzed to determine whether any significance could be established between sample populations. The following results were determined:

- **Male-Female Discrimination**—no score item demonstrated any difference between the male and female population.
- **Age Discrimination**—no score item demonstrated any significance between age and ranges.
- **Black-White Discrimination**—no score item demonstrated any significance between the black and white population.

External EEOC Studies

The Dollar General Company administered The Hartman Profile I (World Profile) and Hartman Profile II (Self Profile) as part of a battery of tests given to 1,075 persons who were either employed by or who were seeking employment with the company. The studies sought to establish whether or not the Hartman Value Profiles I and II met the requirements of the EEOC law regarding nondiscrimination in selection, assessment and promotion situations based on age and age group, sex, and race.

The studies were carried out at three different levels, from the perspectives of the individual rank items, the axiological scores based on Dr. Hartman's scoring system, and the clinical or interpreted scores.

The obtained scores and rankings were subject to a MEANS statistical analysis in order to establish whether or not there was any statistically significant difference between the scores for the respective groups.

The one-way analysis of variance of the difference between the "within groups" and "between groups" variances produced the following results:

- **F Ratio**—the ratio of the "within group" and "between group" variances.
- **Level of Significance**—the frequency we would expect to get the results that were achieved, assuming that both sample groups are drawn from a population in which the mean of each group is equal.
- **E ta^2**—a measure of the proportion of the total variability in the dependent variable that can be accounted for by knowing the values of the independent variable.

Age Discrimination Studies

The EEOC Age Discrimination Studies were based on a sample size of 1,075 employees who were either employed by, or were seeking employment with Dollar General during 1986-87. The studies were based on two groups of subjects. One grouping focused on the age of the individual subjects, beginning with "below 18," continuing at each age, "31," "41," etc., and ending with "over 70". The second grouping was based on the number of subjects in each age group:

Age Group	Participants
LO through 29	421
30 through 39	298
40 through 49	200
49 through HI	156
Total	1,075

There were three types of studies examining the rank items, the axiological scores and the clinical, interpreted scores, exploring the possibility of discrimination in two ways:

- Is the pattern for different age groups the same or different?
- If there is any significant difference in the pattern for different age groups, could such differences be construed to have a detrimental impact on the employability or career development of any particular group?

Based on the Individual Ranking of Items

An analysis of the rankings which 1,075 persons of different ages and different age groups assigned to the 18 items on The Hartman Value Profile I discovered the following:

- For 16 of the items by specific age and 13 of the items by age group, there was no significant statistical difference between the MEAN ranks of the different ages and age groups.
- Of the two items by specific age, and five items by age group where there is a significant difference in the MEAN assigned to those items, the Eta clearly indicated that less than 1% to 8% of the difference was attributable to a person's age or age group.

These findings support the contention that The Hartman Value Profile I rank scores do not discriminate unfairly against persons of any specific age or general age group.

Based on the Axiological Scores

An analysis of 151 axiological scores based on Dr. Hartman's scoring system produced by the 1,075 persons of different ages and age groups produced the following results:

- 139 of the axiological variables by age and 134 of the 151 axiological variables by age group were the same.
- Of the 12 by age variables that had different MEANS scores, nine of them did not have different MEANS scores when re-scored by age group. The remaining three, when analyzed by Eta, were found to have less than 2% of their variance due to age.
- Of the 12 variables by age group that had different MEANS scores, less than 2% of the variance was due to age.

These findings lend strong support to the contention that the 151 axiological variables of The Hartman Profile I do not unfairly discriminate against persons of different ages or age groups.

The findings also lend support to the contention that these axiological scores can be used in hiring and promotion assessments without any adverse effect on persons of different ages who belong to different age groups.

Based on the Clinical, Interpreted Scores

An analysis of 16 clinical, interpreted scores based on Dr. Hartman's scoring system which were produced by the 1,075 persons of different ages and age groups produced the following results:

- For 11 of the clinical scores by age and 13 of the clinical scores by age group, there was no significant statistical difference between the MEAN scores for persons of different ages and age groups.
- Five of the clinical scores by age and three of the clinical scores by age group were significantly different. However, the Eta ratios indicated that in no case was more than 9% of the variance attributable to age or age group.

The findings support the contention that the individual clinical scores analyzed in this study do not discriminate against persons of different ages or persons of different age groups.

Sex Discrimination Studies

The EEOC Sex Discrimination Studies were based on a sample size of 1,075 subjects who were either employed by, or were seeking employment with, Dollar General during 1986-87.

There were three types of studies: examining the rank items, the axiological scores, and the clinical, interpreted scores, each exploring the possibility of discrimination in two ways:

1. Is the pattern for men and women the same or different?
2. If there is any significant difference in the pattern for men and women, could such difference be construed to have a detrimental impact on the employability or career development of any particular group?

Based on the Individual Ranking of the Items

An analysis of the rankings which 1,075 male and female subjects assigned to the 18 items of The Hartman Value Profile I provided the following results:

*   For 14 of the 18 items of the HVP-1 there was no significant statistical difference between the MEAN ranks of the male and female subjects.
*   Of the four items where the MEAN ranks of the male and female subjects were significantly different, the Eta clearly indicated that less than 1% of the difference in both groups was due to gender.

These findings support the contention that The Hartman Value Profile I rank scores do not discriminate unfairly against either men or women.

Based on the Axiological Scores

An analysis of 151 axiological scores based on Dr. Hartman's scoring system produced by the same subjects showed the following results:

*   115 of the 151 axiological variables used in the study had MEAN scores that were equal.
*   Of the 36 axiological scores that had MEAN scores that were statistically different, the Eta analysis revealed that only from 1% to 2% of the variance between the two groups was due to gender.

These findings provide strong support to the contention that the use of the axiological scores used in this study does not unfairly discriminate against either men or women. The findings also support the contention that the axiological scores can be used in hiring and promotion assessments without any adverse effect on either men or women.

Based on the Clinical, Interpreted Scores

An analysis of 16 clinical, interpreted scores based on Dr. Hartman's scoring system produced by the same subjects gave the following results:

- For all 16 of the clinical scores used in this study, there was no significant statistical difference between the mean ranks of men and women.

These findings strongly support the contention that the clinical scores used in this study do not discriminate unfairly against either men or women, and that the use of the clinical scores will have no effect on the hiring or promotion of either men or women.

Race Discrimination Studies

The EEOC Race Discrimination Studies based on the same sample group included the following:

Race	Total Participants
Asian	6
Black	69
Hispanic	6
Indian	1
Caucasian & Other	992
Total	1,075

Based on the Individual Ranking of the Items

An analysis of the rankings that this sample of different racial origins assigned to the 18 items provided the following results:

- For 14 of the 18 items of HVP-1 there was no significant difference between the MEAN ranks of persons of different racial origins.
- Of the four items where the MEAN ranks of persons of different origins were significantly different, the Eta clearly indicated that less than 3% of the difference for any variable was due to their racial origin.

These findings strongly support the contention that the HVP-1 rank scores do not discriminate unfairly against persons of different racial origins.

Based on the Axiological Scores

An analysis of 151 axiological scores based on Dr. Hartman's scoring system which were produced by this same sample provided the following results:

- 124 of the 151 axiological variables used in this study had MEAN scores that were equal.
- Of the 27 axiological scores that had MEAN scores that were statistically different, the Eta revealed that only from 2% to 3% of the variance between the two groups was due to racial origin.

These findings strongly support the contention that use of the axiological scores used in this study does not discriminate unfairly against persons of different racial origins. The findings also support the contention that these axiological scores can be used in hiring and promotion assessments without any adverse effect on persons of different racial origins.

Based on the Clinical, Interpreted Scores

An analysis of 16 clinical, interpreted scores based on Dr. Hartman's scoring system for this same sample group produced the following results:

- For all 16 of the clinical scores used, there were no significant statistical differences between the MEAN ranks for persons of different racial origins.

These findings strongly support the contention that the clinical scores used in this study do not discriminate unfairly against persons of different racial origins. The findings also support the contention that these clinical scores can be used in hiring and promotion assessments without any adverse effect on persons of different racial origins.

Summary Conclusions for The External EEOC Studies

An analysis of the 1,075 subjects broken down by age, sex and racial origin, and evaluated from the perspective of the individual profile rankings, axiological scores, and clinical, interpreted scores indicates that:

- When the MEAN scores by rank, axiological scores and clinical scores for persons of different ages, races or sex are statistically different, the differences in MEAN scores are due to factors other than sex, age or race.

These findings support the use of The Hartman Value Profile, The Hartman Scoring System, and The Clinical, Interpreted Scores based on the scoring system for use in making hiring or promotional decisions, without adverse effects due to age, sex or race.

Instrument Reliability Study of The Hartman Value Profile

The instrument reliability study of The Hartman Value Profile (HPV I and II) is an internal study performed by Value Resource Group. The reliability of an instrument measured the probability that the results of the assessments generated by the instrument are not a result of chance. This study analyzed basic Hartman axiological scores, as well as interpreted scores.

Two samples used in this analysis were selected from an applicant database generated for Dollar General Corporation over a three-year test project. Two hundred re-test situations were used for the reliability analysis. The 200 profiles used were selected in no particular order from a larger population of applicants re-tested at different times.

The first analysis examined each of the sample files and the score items generated by computer scoring of The Hartman Value Profile. The instruments were evaluated according to Hartman's scoring scheme and the interpreted factors, based on the axiological combinations. This analysis consisted of calculating the arithmetic mean and standard deviation for each of the data items in each of the data files analyzed.

The second analysis processed the data files concurrently and produced the Spearman Rank Order Correlation Analysis. This analysis is designed to compare the differences of each item of each subject. To achieve a significance level of .001 the analysis needed a rank order coefficient of 0.549. The group rank order coefficient for the test sampled as 0.974. The strength of the coefficient provides an extremely high level of significance and confidence in the reliability of The Hartman Value Profile.

Concurrent Validity Studies of The Hartman Value Profile

The most significant statistical evaluation for the purpose of concurrent validation of The Hartman Value Profile for the purposes of concurrent validation of the HVP centers on the correlation of the HVP scores with comparable elements from industry-accepted, psychological testing instruments. This correlation evaluates the probability that the measure of correlation or association obtained was due to chance. Any probability less than $p < .05$ points to a statistically significant association.

By far the most significant work correlating the HVP to industry-accepted models to date is centered in the work of Dr. Leon Pomeroy, the retired chief of a biofeedback and stress management unit at The Veterans Administration Medical Center Outpatient Clinic in Brooklyn, NY. He holds advanced degrees in the fields of both psychology and biology from the University of Texas at Austin and University of Massachusetts at Amherst. Dr. Pomeroy is a respected clinical researcher in the field that he discovered—Behavioral Axiology. He has published many papers on the subject of stress, lectured on the stress correlations between axiology and psychology, conducted years of research on the cross-cultural correlations of The Hartman Value Profile, and has served as editor or associate editor for psychological journals. Currently Dr. Pomeroy is in private practice, consulting, writing and serving as president of The Hartman Institute.

Dr. Pomeroy and Dr. John Davis published findings of their concurrent validity study of The Hartman Value Profile as it relates to the Minnesota Multiphasic Personality Inventory (MMPI), Cattell 16PF, Personal Belief Inventory (PBI), Cornell Medical Index (CMI), and Auto Lethality Index (ALI).

Two sets of data were used in this study. One group, collected in 1981, included a population of 68 patients, 180 students, and 125 doctors. A second group, collected in 1982, had a population of 72. Both groups were largely male. The MPI instruments were scored by a VA computer facility, the IPAT data was scored by IPAT, the HVPs were scored at the University of Tennessee by Dr. Davis, and the PBI, SMI and ALI were scored by Dr. Pomeroy. All comparisons listed in the report had a probability of $p < .05$.

In the correlation of the HVP with the MMPI, 128 HVP/MMPI correlations of less than $p < .05$ were located. Of these 128, more than 75 had a correlation of better than $p < .001$.

The PBI/HVP correlation indicated 18 scores with a correlation of less than $p < .05$.

The CMI/HVP correlation indicated 6 scores with a correlation of less than $p < .05$.

The AL/HVP correlation indicated 4 scores with a correlation of less than $p < .05$.

These are highly significant correlations pointing to the high validity for the HVP in clinical applications. The correlations with the MMPI are highly significant, and indicate that the measure of one's value system and capacity for making value judgments is a significant measure that has valid and useful applications.

The data from Dr. Pomeroy's studies establish a concurrent validity argument for The Hartman Value Profile in the measurement of self-defeating behavioral states commonly referred to as psychology and commonly measured by such instruments as the MMPI and CAQ. Moreover, the empirical results of the study provide credibility for The Hartman Value Profile, as well as the science of axiology itself.

Dr. Pomeroy has continued to collect and analyze data that he has presented as updates to his research at the annual meetings of The Hartman Institute. He is also currently writing a book on the results of the studies.

Dr. John Austin, a long-time member and current Chairman of The Hartman Institute, has conducted additional correlation studies. Dr. Austin has conducted many studies on the value of The Hartman Value Profile for education, investigating the use of the HVP to identify highly gifted students. He conducted a series of studies on the measure of moral value, correlating variables from the HVP with variables from the Rokeach Value Survey, Kohlberg's Theory of Moral Development, and Allport-Vernon-Lindzey Study of Values. The correlations from his study of the HVP and Kohlberg's moral variables and Rokeach variables show a higher significance (where Rho, or measure of statistical correlation was largely above .900) than the variables from the study of specific values from the Allport et al study. These results are to be expected, since the HVP measures one's capacity to make value judgments rather than the measure of one's specific values.

Criterion Validity Studies

The construct validity studies establishes that the HVP measures what it is designed to measure—the capacity to make value judgments. The test-retest reliability study demonstrates that the profile results can be counted on to be a reliable indicator over time of an individual's capacity to make value judgments. The EEOC studies give confidence that the HVP analyses can be used without discriminating by age, race or gender. The concurrent validity studies lend weight and credibility to the validity and reliability of the HVP-based analyses as accurate measurements of the ability to make value judgments. The accumulated weight of these studies gives confidence that the HVP-based analyses are accurate, valid and reliable diagnostic predictors.

The internal and external studies, as well as the concurrent studies, confirm that HVP-based analyses are an accurate measure of a person's specific capacity to make value judgments, such as the ability to pay attention to practical values and concrete detail. The information generated can be validly and accurately utilized to identify value patterns in individuals, groups and to identify resources for enabling an individual to learn how to develop an understanding of their value capacities and chart a development course.

Criterion validity measures the capacity of the HVP-based analyses to be used as valid predictors. In other words, how well do the HVP and the report instruments function as an indicator of performance in specific areas such as sales, management and customer relations? Can the HVP analyses be used to decide ahead of time which individuals have a better chance of succeeding in a specific environment?

Value Resource Group has collected data from a variety of organizations—data within different geographical areas of organizations, within specific performance areas, and between performers who were demonstrating either ability or lack of ability. One consistent factor which VRG has continuously found and pointed out to clients is that value patterns that indicate success and, thus, can be validated as predictors, vary between companies, within companies and within performance areas. Unless the diagnostic patterns measured by the HVP are empirically correlated to those factors that measure success for a specific performance function in an individual company, and in an individual geographical location for the company, the information cannot be reliably used to predict who will and who will not succeed.

Criterion Study of the Sales Performance Model

One particular statistical criterion study conducted for Value Resource Group analyzed the Sales Performance Model. Tim Garton Associates, Lemont, IL, conducted the study.

The Sales Performance Model was initially based on the findings of a Yale University study published in *The Journal of Personal Psychology* that identified and evaluated 5,000 successful sales people over a five-year period. The findings of the study identified the major factors of sales success as "empathy" and "ego drive." VRG expanded this study to develop a measure of a person's capacity to relate, handle rejection, be a self-starter, have versatility of motivation, be able to think and see what needs to be done, manage stress, and be able to organize and plan. The model included 49 basic factors that are based on an integrated analysis of scores the The Hartman Scoring System.

The criterion study was conducted as an empirical validation of the sales-interpreted functions of the Sales Performance Model. The population used for this study consisted of 100 non-sales persons, 87 moderately successful sales persons ($50,000-$100,000 in yearly commissions) and 50 successful sales individuals ($100,000-$500,000 in yearly commissions). The sales population was selected primarily from insurance and estate planning individuals with a proven three-year performance record. The non-sales population was selected at random from the database of Dollar General job applications.

Methodology of the Sales Criterion Study

In the initial scoring process, The Hartman Value Profile takes the ordinal rankings and converts them into interval scales or scores. The scoring process weights the Hartman rank data according to The Hartman Scoring System. VRG further weights the interval data and generates new interval data. This new interval data is used to determine 49 sales factors that are used to measure sales strengths and development areas.

This statistical analysis analyzes the final interval data and variables and considers the significance of the differences in the values of distributions between a sample of non-sales persons, mid-level sales persons and top sales persons.

With interval scales data in three sample populations, an analysis of variance tests resulting in an F ratio was chosen. Decision rules on interpreting the F ratio were values of 2.00 and above for 0.05 level significance, and 4.00 and above for 0.01 levels of significance.

For variables not deemed significant in the ANOVA test, a new test of the two extreme populations, on-sales and top sales, was constructed. Given the smaller size of the top sales population and the dominance in size of the non-sales population, the Kruskal-Wallis test was applied.

Summary of Results

This study focused on three sample populations:

1. **Non-sales**—100 cases
2. **Mid-sales**—87 cases
3. **Top-sales**—50 cases

The results of comparative tests of all three populations indicate that of the 49 variables analyzed:

- 26 were significant at the .01 level
- 14 were significant at the .05 level
- 2 were significant at the 0.10 level
- 7 were not significant

Subsequent studies of the two extreme populations—non-sales and top-sales—indicated significance for two of the seven not deemed significant.

Overall, these results indicate a very powerful statistical model with a high level of statistical significance relating to samples drawn on the key characteristic that the model is intended to predict—sales ability.