Reliability & Validity: The Science Behind the ZERORISK Hiring System

A compendium of current validation studies

The Hartman Value Profile is the testing instrument underlying the ZERORISK Hiring System. It 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 exercise that requires the subject to rank order 18 different statements in two different lists. This forced ranking of the statements requires that the subjects evaluate each statement and compare it to every other statement. Added to Dr. Hartman's two lists are two similar lists created by Dr. Robert Kinsel Smith. The candidate's rankings of these lists are compared by the software to the rankings in the first two lists to further validate and check the reliability of the candidate's responses.

The resultant rankings demonstrate the subjects' different capacities and orientations 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.

Formal Axiology is the scientific system of identifying and measuring value. The Hartman Value Profile is one means by which an individual person's propensity and capacity to value may be measured. 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, or their emotional intelligence.

That we are able to simply and objectively measure a person's structure of value has significant ramifications for business. The Hartman Value Profile eliminates much of the need for arduous and expensive psychological testing for business purposes. It provides an easy-to-use, objective, deductive measurement that is used for interviewing, employee counseling, training, and

development. Businesses have used the Hartman Value Profile in candidate selection as well as designing training programs and measuring their efficacy (before and after measurement of growth, change, or improved skills).

The most comprehensive book to date covering Dr. Hartman, Formal Axiology, and the uses of axiology is Drs. Rem B. Edwards and John W. Davis' book, *Forms of Value and Valuation,* University Press of America, 1991.

Summary of Validation Studies

This section summarizes 20 studies conducted on groups of people who completed the Hartman Value Profile. It serves as a general introduction and index to studies that prove the validity and reliability of the Hartman Value Profile. Validating tests is the multifaceted discipline that determines the accuracy, dependability, and 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, ensuring that the nature of the instrument does not significantly affect the outcomes. The process of validating an instrument is compartmentalized with each different process measuring different aspects about the instrument.

The studies summarized in this section measured 16 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. All of the studies described comply with the American Psychological Association's guidelines for analysis of psychometric instruments and follow industry-standard procedures for statistical analysis. Since the Candidate Profile and Interview Guide generated by the ZERORISK Hiring System is based on the Hartman Value Profile, these conclusions should also apply to this hiring system.

The Equal Employment Opportunity Commission (EEOC) has established that screening instruments, psychological testing, personality tests, and all other evaluation procedures that are

to be 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, retention, licensing, and certification.
>
> *Federal Register, Vol. 43, No. 166, 8/25/78*

Various studies have sought to determine whether the Hartman Value Profile discriminates based on age, race, or sex. Every known study to date has concluded that the Hartman Value Profile does not discriminate on any of these three bases.

Discrimination by Age

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

Age Study A

Value, Inc. (Wayne Carpenter and Edward Martin) conducted this study.

Two separate sample populations of 200 persons were built by random selection from a group of more than 6,000 people. The groups represented adults below the age of 30 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 ages (resulting in a $p > .2$). For all 54 items $p < .01$. **Thus the Hartman Value Profile did 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 (Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald) with funding by a grant from the Dollar General Corporation.

The sample population was 1,075 persons who were either employed or seeking employment within a large corporation. The ages of the participants ranged 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 the 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 Hartman Value Profile also did not discriminate between people of different ages in this study. This is true with analysis being done either by individual ages 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

Value, Inc. (Wayne Carpenter and Edward Martin) conducted this study.

Two separate sample populations of 200 people were built by random selection from a group of more than 6,000 people. 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 authors concluded that: "in compliance with EEOC regulations, the Ho (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." **Therefore, the Hartman Value Profile did not discriminate between males and females in this study.**

Sex Study B

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

The 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 was completed using the F ratio between the groups and the E ta^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."

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

Race Discrimination

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

Value, Inc. (Wayne Carpenter and Edward Martin) conducted this study.

Two separate sample populations of 200 participants were built by random selection from a group of more than 6,000 people. The groups represented adults of Caucasian and of 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 measured and compared. The results were that all 54 scores, using the T-test, were found to have a $p < .01$.

The Hartman Value Profile did not discriminate among different races in this study.

Race Study B

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

The sample population consisted of 1,075 persons who were either employed or seeking employment within a large corporation. There were five racial groups represented: African-American, American Indian, Asian, Caucasian, and Hispanic. Analysis of the results were completed using the F ratio between the groups and the E ta^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: "Mean ranks for persons of different racial origins for the following normative items will not be statistically significant in differences when using the Hartman Value Profile."

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

Lost Time Injury Study

The goal of this study is to determine whether the aspects of thinking that the Kinsel Hartman Profile measures can enable us to distinguish between people who are accident prone from those who are not accident prone, provide a means to identify accident prone people based on their thinking methodologies, and provide the construction industry effective hiring and training strategies that will reduce the occurrence of lost time injuries.

The Study

The study included 54 participants, 25 of whom had perfect safety records and 33 who had lost time injuries while on the job. The participants come from nine different large construction companies, principally in the commercial building and highway construction industries, covering the continental United States.

Each of the participants was asked to participate in the study and did so voluntarily. Approximately 15% participated anonymously by putting a code rather than their own names on the Profile questionnaire. Each person was given a Kinsel-Hartman Profile (KHP) to fill out. The KHP is a set of four paper and pencil tasks whereby the participant ranks eighteen different statements from best to worst. The Profile forms were submitted to ZeroRiskHR, a division of the International Risk Management Institute, where they were processed. Processing consists of entering the participant's rankings into a software package that analyzes the responses and then generates specific scores. Dr. Robert Kinsel Smith, based on Dr. Robert S. Hartman's work in formal axiology, developed this software. The generated scores were then entered into two different tables: one for the safe workers and one of the lost time injury workers. These tables of scores were then sent to Dr. Robert Kinsel Smith for analysis and summarization.

Hypothesis

Based on thirteen years of applying the Kinsel-Hartman Profile to business applications, I conjectured what thinking orientations would show up to be consistent with lost-time injuries. The first area that I thought would have some significant differences between safe and unsafe workers was the dimension of Practical Thinking. I thought that accident proneness would correlate to a strong inattentiveness to Practical and Decisiveness thinking. This dimension is that of seeing things and people as they are in the practical, functioning world. This is seeing how one thing leads to another, how things change, and how things actually work. If a person has a strong inattention to these aspects, then s/he will not be aware of how things change, how one action can lead to another action or reaction, and how timing, energy, and momentum play a part in outcomes. So

scores of 2 & 3 are expected to be problematic, as it applies to people being safe in a dangerous construction environment.

The second thinking orientation that I anticipated would be directly associated with lost-time injuries was a strong inattention to Adherence and Organization. This dimension is the one of rules, policies, and standards imposed by others on a person. When a person has a score of 2-4, that person reacts emotionally to being told what to do or how to do it. This orientation is expected to lead to accidents because the person would have an inner aversion to safety policies, procedures, conventional wisdom, and doing things in a safe-routine manner.

The third orientation that I expected to be consistent with lost-time accidents also concerned the Adherence & Organization perspective, but on the opposite end of the scale. I expected to find that a fixation on this dimension would correlate to injuries. While a fixation will cause a person to blindly follow rules and policies, it can also cause a person to think about how they think things should be instead of being able to see how they are. So a person who is fixated on their idea about how something should be done or how safe a particular activity will be, can actually be blinded by this concept and thereby miss what actually is. A score of 9 or 10 was expected to be associated with the lost-time injured subjects.

The final thinking orientation that I expected to be different between the two groups concerns the Self Awareness. This orientation indicates the persons' attention to their physical bodies, awareness of how their actions affect the world around them, and awareness of how their own actions lead to the outcomes they experience. I conjectured that the injured workers would be less aware of this aspect of themselves, either too much so or not enough.

Findings

This first chart lists the two groups' ranges of scores for the three dimensions in the world and self frames of reference.

	Ranges of Safe Workers	Ranges of Injured Workers
World Orientation		
Intuition and Empathy	2-8	2-8
Practical and Decisiveness	3-9	2-9
Adherence & Organization	5-9	3-9
Self Orientation		
Self View	1-7	1-5
Self Awareness	1-9	1-9
Self Expectations	2-9	2-9

This chart indicates that two of the conjectures were accurate. One could surmise that some risk can be associated with people who score a 2 on Practical and Decisiveness thinking or a 3 or 4 on Adherence and Organization thinking. A score of 2 indicates that the person is essentially blind to how people and things work and inner-relate to one another in the practical, real world. A score of two for the Practical and Decisiveness dimension indicates that the person does not see how one thing leads to another, how things change, and how things actually work in the practical/real world.

The second group of scores: 3 & 4 on Adherence and Organization, indicate a rebellious disposition. As stated above, to get these scores a person has to have a strong aversion to rules, order, standards, or policies imposed by others. So these people have a reaction against "adherence" to standards, rules, or policies.

The only orientation that was anticipated that is not distinguished by the participants' profile scores was the over attentiveness to Adherence and Organization. Either the strict adherence keeps the people safe or the study population was too small (since no one scored 10 on this dimension).

Conclusion: Risk can be associated with the following scores

Practical Thinking and Decisiveness	0 - 2
Adherence and Organization	0 - 4

The second analysis of the scores addressed the averages of the groups. The rule of thumb for interpreting the scores, is the closer to 6, the clearer the thinking: the better judgment. While I hoped that the average scores would be significantly different and thereby provide distinctions between the two groups, I conjectured that they would likely not show much difference because the extreme scores would average out each other.

The following chart lists the average dimensional scores for the two groups.

	Safe Workers' Average	Injured Workers' Average
World Orientation		
Intuition and Empathy	5.2	5.6
Decisiveness and Practical	5.9	6.2
Adherence and Organization	7.7	7.5
Self Orientation		
Self View	3.6	3.3
Self Awareness	5.5	5.3
Self Expectations	7	6.67

Conclusion: The averaging of the scores indicates slight differences but does not demonstrate any statistically significant differences between the groups.

From the results listed in the second chart, I would have to assume that the populations of the two groups brought seeming balance when we did averaging. If a difference really did exist, and it was not apparent by averaging then it would be revealed in an analysis of the variances of the scores. This analysis can reveal differences that hide in averaging because the differences are squared prior to being summed. So in variance analysis, when a lot of differences exist on both sides of the middle, those differences appear (whereas those same differences do not appear in averaging). The following charts display variances.

In this third chart, I compared different variances of the differences between the respondents' scores and the score of 6. A score of 6 represents answers of balance and low-variability. I compared the variance of all of the world and self dimension scores and summed the differences. I also compared the variances of the Adherence & Organization along with the Decisiveness & Practical Thinking. These indicate whether the respondents' answers were varied in a way that the averages would not indicate (the average scores are on the chart in (parens)).

World Orientation

	Safe Workers' Variance	**Injured Workers' Variance**
All Three World Orientations	9.4 (4.6)	10.2 (4.67)
Average of the Variances to 6:		
Empathy	3.2	3.2
Decisiveness	2.8	3
Adherence	3.4	4
Decisiveness and Adherence	6.2 (2)	7 (2)

Self Orientations

All Three Self Orientations	19.8	35.1
Average of the Variances to 6		
Self View	7.3	10.4
Self Awareness	6.5	8.2
Self Expectations	6	6.5
Awareness and Expectations	13.8	18.6

Conclusions:

1. The differences already noted in the world orientations (chart 1) are seen in the world orientation variance analysis. Clearly, the lost time injured people do have a greater disagreement in their brains between how things are and how they think about them (their heads are more in the clouds). This is seen in the Adherence scores of 3.4 (safe workers') vs. 4 (injured workers'). A difference of .6 for a score range from 3.4 to 4 is significant (being > 18% of the former score).

2. The differences between how safe workers think about themselves in comparison to how injured workers think about themselves is dramatic. The major differences are seen in the Self View and Self Awareness scores. These differences of variance, 3.1 and 1.7 respectively, are very significant (42% and 26% of safe workers' scores). The Self View scores indicate that the injured workers are less aware of their own human, unique worth (and are therefore less accurate in accessing their own feelings, abilities to react or withstand stress, or resilience to pressure or rejection). The Self Awareness score indicates the injured workers are less aware of their physical bodies, aware of how their actions affect the world around them, and are less aware of how their own actions lead to the outcomes they experience.

Further analysis of scores: Given the significant differences in the variances, I looked at the frequency of the extreme self scores. The following chart indicates those differences.

	Safe Workers	**Injured Workers**
Self View	16% score < 3	39% score < 3
Self Awareness	16 % score < 3	24% score <3
	12% score > 8	15% score > 8
Self Expectations	16% score < 5	27% score < 5

Conclusions: Some risk appears to be associated with

Self View scores below 3,

the Self Awareness scores below 3, and

Self Expectations scores below a 5.

Summary

Because this study was not designed to be a predictive study, absolute assignment of risk to different scores is both impossible and illegal. In order to use an instrument's scores in that manner, a predictive study will have to be done, where the participants are tested when they are first hired, placed in a category of risk based on their test scores and then have those scores evaluated for accuracy after an extended period of time.

This study does provide guidance in the following ways:

The following orientations are likely to be at risk and when being considered for hire, the company should do a careful background check into the person's safety record and should be careful to train the person carefully regarding safety procedures.

1. Persons with low Decisiveness and Practical Thinking scores (<2)
2. Persons with low Adherence and Organization scores (<5)
3. Persons with low Self View scores (< 3)
4. Persons with low Self Awareness scores (< 3)
5. Persons with low Self Expectations scores (< 5)

Training and job assigning ought to be done with extra precautions as it applies to people with the above thinking orientations. These cautions can apply to how people get assigned to danger-filled roles, how much supervision a person requires before being given sole responsibility for a particular job, or how strict the requirements are enforced before a person is allowed to work a particular type of machinery.

Face Validity

Face validity is the measure of how the structure and content of each statement on the Hartman Value Profile is consistent with Formal 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 Values (Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald) and funded by a grant from the Dollar General Corporation.

The procedure followed was for the axiologists 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 value and valuation for each of the intended combinations.** In every case, they arrived at the same conclusions as 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 and in different contexts with confidence that the presiding conditions did not affect the results with any statistical significance. Reliability is usually proven with a test/retest procedure within a 10-day period. The longer the period, the more reliable the instrument is found to be.

Reliability Study A

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

A group of 86 students at the University of Tennessee was given the Hartman Value Profile. Ten weeks later, the same students were given the Profile again. This lengthy period between testing added to the rigorousness of the testing of the stability of the Hartman Value Profile.

The results of this study prove the reliability and stability of the Hartman Value Profile. All 40 dimensions measured by the Hartman Value Profile 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 confidences above 99.9% with $p<.01$.

Reliability Study B

Wayne Carpenter and Edward Martin of Value, Inc., conducted this study.

A group of 200 adults was assembled from persons who either worked for or were applying for work with Dollar General Corporation. These subjects took the Hartman Value Profile over a 3-

year period. This length of time for a test/retest would demonstrate superior stability of the Hartman Value Profile. 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 measures whether an instrument in both its form and results is consistent with the theory behind the instrument. In this case the measure is to see if the ranks assigned the statements in the Hartman Value Profile (which have a 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 Values (Charles McDonald, Ph.D., Wayne Carpenter, Edward Martin, William Panak, and Gary McDonald) with funding by a grant from the Dollar General Corporation.

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 hypotheses 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 99.9% 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 provides a valid description and explanation of the structure and dynamics of human value and human value judgments."

Concurrent Validity

Concurrent validity is the test as to whether a particular instrument correlates significantly to other valid instruments. This validation provides an alternative means of validating an instrument by "piggy-backing" on the reams of validation of previously benchmarked, psychometric instruments. Leon Pomeroy, Ph.D. and John Davis, Ph.D., conducted this study.

The 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 very comprehensive results of this two-part study can be summarized as follows.

> **Part I:** The Hartman Value Profile correlated with a high degree of significance ($.05 > p < .0001$) in 36 different specific measurements to the MMPI, CMI, AL, and PBI.

Part II: The Hartman Value Profile correlated with a high degree of significance (.05> p <.0001) in 32 different specific measurements to the 16PF 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 ensure its axiological validity by validating it against benchmark axiological instruments. Drs. John Austin and Barbara Garwood conducted this study and presented the findings at the National Association of School Psychologists Convention.

The 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 comprised 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 or more subgroups that scored above and below the median. The study indicated that the expected and obtained mean rankings were significant with a correlation of .95. For the compositional versus transpositional items the confidence is highly significant with a p<.001. The individual items test indicated that no significant difference existed among 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.

Biomedical Validity

Biomedical validity is the measure of whether the results from an instrument correlate to results of biomedical tests (e.g., heart rate, blood pressure, or components in the blood). When an instrument is proven to be biomedically valid, then a direct correlation has been found between the instrument's scores and physical conditions measured by medical tests. This particular validation proves the objective nature of the instrument and a corresponding relationship between the thinking process of the subject and his or her present physical condition or physical response. This study was conducted by Leon Pomeroy, Ph.D., Elaine Fox, Ph.D., Richard Bishop, Ph.D., and John Davis, Ph.D. It was published in the *VA Practitioner*.

The sample comprised 150 volunteers at a private preventative medicine clinic in New York. Participants were informed that this was part of a study to measure the medical and psychological effects of stress. The study was conducted over a period of 1 year. The working hypothesis—based on Selye's work—was that the Hartman Value Profile results would correlate significantly with certain blood components.

This study demonstrated that the levels for creatinine, calcium, blood cholesterol, sodium, CO^2, and BUN were significantly correlated to the Hartman Value Profile scales measuring: attitudes towards others, ability to concentrate, self-acceptance, self-insight, self-consciousness, anxiety, tendencies to distort things, and depression. The p values ranged from being less than .04 to less than .001.

The results of the study prove that a direct correlation exists between the candidate's thinking structure, measured by the Hartman Value Profile, and compounds found in the blood.

Business Necessity

The EEOC requires that any instrument used in candidate selection "measure those traits and/or abilities that directly relate to what is needed to do the particular job." This is referred to as the "business necessity requirement." When an instrument has either predictive validity or criterion validity it fulfills the business necessity requirement.

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 or 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 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

Drs. Robert K. Smith and Virginia G. Harvey conducted this study. 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. Each candidate was categorized according to risk as a manager: low, medium, or high (however, none of the 78 candidates was excluded from employment based on his or her classification).

At the end of the 3-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 stores profitably, having been fired for just cause, or having quit for any reason.

Risk Score	Number Hired	% Successful
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.

Customer Service Criterion Validity

This study was conducted by Drs. Robert K. Smith and Virginia Harvey and commissioned by James River Corporation.

The study sample consisted 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 the 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 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.

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

	% Higher of Excellent	**p value**
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.

This particular thinking orientation was also confirmed to be a statistically significant differentiator in a study done for the Marriott Corporation on their nationally recognized customer service personnel. That particular study compared employees who had earned more than three Customer Service Stars (which were awarded when headquarters received on behalf of a customer service representative 5 unsolicited letters of commendation from customers) with a large group of new employees that the company had hired for customer service roles. The Marriott study confirmed that an employee's focus on looking good at a practical level (which is one of the motivations that accompany this thinking orientation) was critical for long-term success in a customer service role.

Personal duty is a person's bias about him/herself systemically. This score indicates that those who are better in customer service are internally driven to be responsible, and to fulfill their duties and commitments. This thinking also is a source of internal control, providing the person with constraints and an ever-present value system that regulates and directs behaviors.

On the Clear Direction and Zero Risk HR reports, this means that how high a person's score is in Self Concept or Self Expectations Thinking correlates to how well the person will perform in

customer service. So a group of 10 people with scores of 7, 8 or 9 (limiting the range to 9 because of the extremely high frequency of reactions required to generate a score of 10) will outperform a group of 10 people with scores of 3, 4 and 5 in a customer service role.

Sales Criterion Validity

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

The study sample was 237 people. Of this sample, 137 people worked as salespersons in the insurance and estate planning industry. The sample was divided into three groups: non-salespersons, moderately successful salespersons, and very successful salespersons. The objective criterion to separate the sales groups was commissions earned for the 3 previous years. The criteria for distinguishing these persons into three groups were:

- 100 non-salespersons randomly selected from a database of more than 5,000 general employment candidates.
- 87 salespersons earning commissions between $50–100K/yr. for a 3-year period: labeled moderately successful.
- 50 salespersons 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 the six dimensional areas that the Hartman Value Profile measures.

Area Measured	Statistical Significance
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 confirms that the Hartman Value Profile does distinguish behaviors necessary for excellence in sales.

Management Criterion Validity (Study A)

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

A sample of 150 managers of Sara Lee outlet stores was given the Hartman Value Profile. All participants had been identified as qualified for management and had been managers of their respective stores for less than 2 years. They were given the Hartman Value Profile as part of their ongoing management training and education.

Two years later, the head of this division of Sara Lee divided the list of names from the sample into 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) that scored all managers on a numeric scale. These scores provided further distinctions by which the excellent managers (28) were distinguished from the good managers (79). Managers who were identified to be failures (43) had been removed or had quit their positions. They had failed for various reasons ranging

from an inability to effectively lead and manage people, to an inability to effectively and efficiently oversee operations, to 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 initially selected by management as capable store managers without being tested.

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 percent more empathic with a valence of I1 of 54 percent positive versus 54 percent negative)
- A greater tendency to work with others than do it himself or herself (excellent were 53 percent more inclined to delegate with a E1 valence of 28 percent versus 43 percent positive)
- A greater tendency to be proactive rather than reactive (excellent were 18 percent more planning oriented with S2 Dim of 11 versus 13)
- Greater personal courage (resulting in less defensiveness) (excellent had 42 percent healthier self-esteems with an I2 Valence of 25 percent versus 16 percent positive)
- Greater resiliency when under stress (excellent were 50 percent better able to function in stressful situations with BQRs of 1.1 versus 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. A sample of 257 managers from eight different companies was given the Hartman Value Profile between a five year period. 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 budget. All were also assessed by their peers, subordinates, and superiors, who identified them as excellent (70), good (100), or poor (87). For a manager to be identified as poor, he or she had to have ongoing significant problems, ineffectiveness, 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 percent more empathic with a I1 valence of 59 percent versus 43 percent positive)
- A greater tendency to work with others than do it himself or herself (excellent were 25 percent more inclined to delegate with an E1 valence of 32 percent versus 44 percent positive)
- Greater personal courage (resulting in less defensiveness) (excellent had 13 percent healthier self-esteems with I2 Dim of 11 versus 13)

- A greater degree of reasonability when confronted (excellent were 18 percent more reasonable and less stubborn than the poor managers were with an S2 dim of 12 versus 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). The Hartman Value Profile was given to 120 women in business for a four year period as part of their ongoing training and development. They came from more than 20 different companies in six different states. Their ages ranged from mid-twenties to mid-fifties. The sample was divided into two groups: those who were executives 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 percent clearer in their decision making and common sense judgment with a Dim E1 of 7.25 versus 8.9)
- Greater personal courage (resulting in less defensiveness) (Managers had 20 percent healthier self-esteems with an I2 Val. of 22 percent versus 19 percent and Dim of 10.1 versus 12.5.)

- A greater ability to make accurate self-assessments of their own strengths, limitations, and competencies (Managers were 12.5 percent clearer and more accurate assessing their own abilities and roles with a DimE2 of 12.75 versus 14.25.)
- A greater degree of personal freedom to make mistakes, risk loss, and shift one's own priorities (Managers were 13 percent more reasonable and less dogmatic than the non-managers were with a Dim S2 of 11.5 versus 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 promoted into management positions and those who are not promoted.

Accountants vs. Financial Analysts

A Goldman Sachs' Archon Group study was conducted to provide the parameters of success for two different roles within the Archon Group. Prior to this study, there was much discussion and disagreement about the differences between accountants and financial analysts, with some executives arguing that accountants should be put in the track to become financial analysts. The purpose of this study was to determine whether the differences that some argued were present were measurable and were material in deciding how to compile career tracks for accountants.

The study population included 35 employees: 17 financial analysts and 18 accountants. While this sample is not large enough to provide statistical significance at levels below $p=.01$, the differences between and within the groups were definite, as were the similarities within the groups. The financial analyst and accountant groups were both divided into two: performers and non-performers. Their respective managers assigned the members of these groups based on their work experience with these people. While this methodology introduces significant levels of subjectivity, this type of comparison is appropriate because it is this same subjectivity that is present in the day-to-day workings of the company.

The instrument used to measure characteristics of the respondents was the Kinsel-Hartman Profile. It was chosen because of the deductive nature of the science behind the Profile and the resulting objectivity, the precision and sensitivity of the Profile to distinguish differences in people, and the practical insight the results provide to human resources specialists for hiring and training within the Archon Group. The Profiles were distributed to the members of the study by three members of the Human Resources department of the Archon Group. The participants were asked to participate with an understanding that they would receive feedback concerning the findings of this study.

The Kinsel-Hartman Profile measures two significant aspects of the participants' thinking: their capacities to value and their biases in their orientations. Another way to describe these two characteristics is clarity of thinking and preferences in thinking. The Profile results distinguish the participant's thinking three different dimensions of value: intrinsic, extrinsic, and systemic value. These three dimensions are then distinguished further by noting how the person thinks in these ways in relation to the world, people, and things outside, and in relation to one's own self. For ease of understanding, the "world" dimensions are titled Intuition & Empathy (Intrinsic Value), Decisiveness (Extrinsic Value), and Adherence and Organization (Systemic Value). A fourth score was added to the study, Types of Reasoning, because it distinguishes a person's quality of logic (conventional and analytical, intuitive, or unconventional and highly creative). The "self" dimensions are titled Self View (Intrinsic Value), Self Awareness (Extrinsic Self) and Self Expectations (Systemic Value). To this list was added a score, Attention Balance that indicates the participant's overall balance between their world and self-orientations.

The Findings

The persons who conducted the study, while being very familiar and confident in the Kinsel-Hartman Profile, were surprised at the differences between the scores of the performers in the Accountant and Financial Analyst groups. It is often held that these two groups would require very similar skill sets and abilities, so the overseers of this study anticipated that the Profile scores of the performers in these two groups would overlap with no distinguishing differences. While they did overlap, distinguishing differences were detected. The differences are summarized below.

The performers (analysts, accountants, and executives) all displayed the following orientations:

1. A high ability to read people with a generally balanced orientation towards others' feelings and uniqueness.
2. An optimistic orientation toward rules, order, analytical concepts and processes,
3. A self-deprecating attitude about their own unique self value.
4. A strong need to strive to achieve one's own goals, meet personal expectations, and not be satisfied until they have met their own standards.

These areas of agreement are the foundation from which we can surmise characteristics about the Archon Group company culture in general. First, one could contend that the culture is one that is neither sympathetic (as are many family-owned companies) nor personally removed (as are many financial-services cultures). While the company's overall average is a little below the average of business people in general, it did not fall out of the range of being attentive to others' interests or able to understand the importance that personal feelings and opinions play in business. One could conclude from this score that the Archon Group will be a little too impersonal for very sympathetic, personally involving people while its people are able to empathize and understand the unique motivations of others.

Secondly, we can conclude that the Archon Group is an analytical culture. While this may seem to be an obvious conclusion, given the nature of the business, the scores also indicate that it is closer to being balanced in this regard than most companies. This proximity to balance indicates that the members of the Archon Group are clearer planners, reasoners, and analyzers than most people in business, and that they are better able to consider and understand change or analyze concepts, plans, or problems thoroughly.

Thirdly, we can conclude that the Archon Group is comprised of people who dismiss their own feelings and self-development for the sake of those things to which they commit themselves. While this is the classic orientation of strivers and high-achievers, the Archon Group scores indicate that their employees have more balance and clarity than most people in this regard. This difference indicates that the effective employees of the Archon Group have more accurate and healthier self-images. We can conclude that this clearer thinking concerning one's own self-expectations leads the Archon Group employees to be more flexible, better able to adjust to new situations, more

inclined to learn new things about themselves, and less inclined toward personal dogmatism or stubbornness. This difference has also been observed in other studies as a key difference between top salespeople and mediocre salespeople. Like the top salespeople, the Archon Group employees are persistent but not insistent.

The Accountant Group

The accountant performers are not distinguishable from the non-performers in their world orientations on the Profile. All of the accountants were within one score of each other for all four "world" thinking orientations. This is not a surprise, since all of the accountants passed through the same requirements in order to become accountants. Where the members of these two groups differed was in their "self" orientations. The non-performers' scores indicated greater extremes: greater personal sensitivity to rejection, lower confidence, higher degrees of insistence, or a heavy imbalance away from one's own unique self (feelings) and toward one's ideal self (personal expectations).

The facilitators of this study analyzed the results to determine benchmark ranges for the different thinking orientations of the different groups. The accountant benchmark ranges are as follows:

	Fits	**Careful**	**Watch Out**
Intuition & Empathy	5-7	4, 8	0-3, 9-10
Decisiveness	4-5	6, 7	0-3, 8-10

Adherence & Organization	7-8	9	0-5, 10
Types of Reasoning	A, C, D	F	All others
Self View	5	4, 6-7	0-3, 8-10
Self Awareness	4-5	3, 6-7	0-2, 8-10
Self Expectations	7-8	6, 9	0-5, 10
Attention Balance	1, 1.7	.7	.3, 3

In understanding human behavior and success, it is important to remember that one particular weakness in a person's thinking does not usually lead to failure. It is also true that a weakness in a specific dimension is usually compensated for by a strength in another area. Therefore when analyzing Profile scores or a person's thinking, it is important to take the entire thinking orientation into account. A simple, yet reliable, way to do this is to assign points for being outside the ranges of successful people. When the sum of the points reaches a certain threshold, then the person most likely has too many variant thinking orientations to succeed.

In order to arrive at a composite score for each candidate, a number was assigned for all scores falling within the "Careful" and "Watch Out" ranges. For every score in the "Careful" range, the person received 1 point. For every score in the "Watch Out" range, the person received 3 points (these valuations were chosen because the "Careful" scores border the "low risk" scores, while a "Watch Out" score indicates a significant variance from the thinking orientations of successful performers). The "performers" total point average was 3 points while the "non-performers" averaged 5 points each. Not only were the averages different, but also all "non-performers" had scores above 3, while no "performer" had a sum higher than 7.

For the purposes of using the Kinsel-Hartman Profiles in helping assess accounting candidates, the sums were grouped into the following three categories:

Points Sum	Conclusion
0 – 3	Most likely will be a success in that role
4 – 7	Look carefully at this candidate, about a 50-50 likelihood of success.
>7	Be very cautious about hiring this person since all with this sum were identified as non-performers.

The Financial Analyst Group

Unlike the accountants, a sub-set of the financial analysts were distinguishable in their world orientations. While most of the analysts were within one score of each other for all four "world" thinking orientations, half of the non-performers had stronger skepticism and lower abilities to think practically, politically, or tactically than all of the performers. While this orientation was evident in almost half of the accountant performers, it was not present in the analyst performer group. This leads us to believe that the axiological difference between accounting and finance is evident when comparing the thinking orientations of the performers with the non-performers and with the analysts and the accountants.

Axiology distinguishes extrinsic value and systemic value. Extrinsic value (decisiveness) is the world of doing business: making decisions, spending money, people in groups, etc. Systemic value (adherence & organization) is the world of rules, order, systems, and compliance. When looking at the applications of money through these two value filters, one can readily see that the extrinsic application of money is finance (how people spend it, trends, markets, randomness, unpredictability, etc.), while the systemic application of money is accounting (rules, conventions, credits and debits in the "right" places, double entries, etc.). In the case of the Archon Group sample of financial analysts, no "performers" were foggy in their extrinsic thinking (finance), while many accountant "performers" were foggy in their extrinsic thinking. So a person is able to be a successful accountant without a clear ability to think about the applications and relative uses of money, while no such person was successful as a financial analyst.

Where the members of these two groups differed in their "self" orientations was also in the extrinsic dimension (self-awareness). The non-performers' scores indicated less clarity in this dimension. This indicates lower confidence or personal ability to contend for one's usefulness in the face of opposition, competition, or being questioned. In other words, the performers of the analyst group were (for the most part) confident and aware of their own competence.

The analyst benchmark ranges are as follows:

	Fits	**Careful**	**Watch Out**
Intuition & Empathy	6-7	5	0-4, 8-10
Decisiveness	6-7	5, 8	0-4, 9-10
Adherence & Organization	8	6, 7	0-5, 9-10
Types of Reasoning	A, C, D, F	G, I	All others
Self View	4-5	3	0-2, 6-10
Self Awareness	5-7	3, 4	0-2, 8-10
Self Expectations	6-8	9	0-5, 10
Attention Balance	.7 - 1.7		.3, 3

Again, in order to arrive at a composite score for each candidate, a number was assigned for all scores falling within the "Careful" and "Watch Out" ranges. For every score in the "Careful" range, the person received 1 point. For every score in the "Watch Out" range, the person received 3 points. The "performers" averaged 2 points each while the "non-performers" averaged 6 points each. Not only were the averages different, but all "non-performers" had scores above 3, while no "performer" had a sum higher than 6.

For the purposes of using the Kinsel-Hartman Profiles in helping assess financial analyst candidates, the sums were grouped exactly the same as the groups for the accountants:

Points Sum	Conclusion
0 – 3	Most likely will be a success in that role
4 – 7.1	Look carefully at this candidate, about a 20% likelihood of success.
>7	Be very cautious about hiring this person since all with this sum were identified as non-performers.

Two Other Orientations

While the above materials show that it is not appropriate to focus on any particular thinking orientation as a problem, two different problematic orientations appeared from this study and make sense in light of the Archon Group's culture and business. The first is a negative orientation toward systemic value in the world (adherence and organization score below a 5). This indicates that the person has natural and continual skepticism about rules, order, structure, compliance, and the absolute nature of formal constructs. One person at the Archon Group with this orientation was profiled, was identified as a non-performer, and recently resigned from the company.

The second orientation is not one aspect alone but rather is a measure of the difference between the world extrinsic and systemic orientations. When a person has a strong orientation toward systemic value (adherence and organization) and a strong reaction against extrinsic value (decisiveness), the difference between the two can result in problematic behavior. Only one manager had this great of a difference between these two orientations and resigned within a year of coming to the company. One could postulate from this interpretation and example that when the numeric difference between the Decisiveness and the Adherence scores is greater than 3, then the person's ability to function effectively as a manager ought to be investigated very thoroughly.

Conclusion

This study has provided a benchmark from which the Archon Group can more accurately interview and decide on candidates for accounting and financial analyst positions. It provides a reasonable and logical framework from which an interviewer can intelligently direct their review of a candidate for a management, accountant, or financial analyst position.

Accountants are clearer thinkers in the area of logic, adherence, organization, and rules than are financial analysts. Financial analysts are better able to be effective with people on an individual, motivational level, and are more aware of attentive to business and people in political or decision-making roles.

Property Managers

This study differs from the previous three management studies in that we looked at patterns created by multiple dimensions to find differences between successful and not-successful managers. For a commercial real estate client 32 property managers' Profile scores were categorized into two distinct groups: the top and bottom performers. The top group comprised 19 people, while the bottom group comprised 13. Only the Profile scores are being considered in this review, so experience, management oversight, individual working conditions, individual personal circumstances, education, and IQ are not included in this review.

How They Differ

Integrating All Three World Scores

38.5 % vs. 5.3%

A striking difference between the two groups is that 5 of the bottom performers (38.5%) had a positive world systemic and extrinsic orientation with an Empathy score below 7 while 1 of the top performers (5.3%) had this world thinking orientation.

Empathy Scores Alone

53.8% vs. 10.5%

A second significant difference between the two groups is found in the Intuition & Empathy orientation. 2 of the top performers (10.5%) had scores below 6, while 7 of the poor performers (53.8%) had scores below 6.

Correlating Empathy and Outer Self/Self Assessment Together

46.2% vs. 0%

A third difference lies in the combination of Self Assessment and Empathy thinking. 6 of the poor performers (46.2%) had a Self Assessment score greater than 6 with an Empathy score less than 6, while no top performers (0%) had this combination.

Overall Attention Balance Scores

38.5% vs. 15.8%

The final significant difference concerns the managers' self views in relation to their world views. This is what the Attention Balance score indicates. 3 of the top performers (15.8%) were outer directed (score of 3) while 5 (38.5%) of the bottom performers had that same orientation.

If These Scores Were Relied Upon

If we remove the bottom and top performers who fall into the above "high risk" categories, the result would be the loss of 12 of the bottom performers (92.3%) and the loss of 5 of the top performers (26.3%). If the company employed this analysis, it would miss out on a quarter of the top performers in order to reduce the hiring of their poor performers by more than 90%.

Based on this population, if the company only considered the first three distinctions has their critical factors, they would cut their poor performing population by 9 (69.2%) and would only lose 2 of their top performers (10.5%).

What These Differences Mean

The first difference indicates that the poor performers had positive orientations concerning Structured (Adherence and Organization) and Practical (Decisiveness) and did not have a balancing orientation concerning the individual nature of people (Intuition & Empathy). We have titled this world thinking orientation, "the Special Projects Specialist) because these people automatically gravitate toward individual tasks that have clearly defined beginnings and ends without a need to be attentive to the opinions, interests, and personalities of individuals with whom they work. In other words, they are results focused without a compensating attention to the people-side of their role. This pattern has consistently proved to be a high-risk pattern for people in a management role.

The second difference indicates the same net effect, an inattention to the individual nature of the people with whom the manager is working but is much more specific. In this case, the orientation about doing things right and getting things done is not the focus. Here the focus is on the person's unwillingness to give time or energy to listening and caring about what is important to others. The difference is subtle but important. In the above group, the focus is on getting things done and not having a compensating attention to others' individuality. In this difference the empathy score below 6 indicates that the manager has a negative aversion to giving time or attention to others' individualities. The former is the absence in the face of other priorities. This is the aversion concerning spending time or energy about these things. This thinking orientation is also consistently a risky orientation for people considering management roles.

The third difference concerns a person's confidence and desire to accomplish things, getting attention, or being seen as competent and in charge in comparison to the person's attention to the well-being of others. Again, we are dealing with the manager's need to be attentive to others and

in this case the orientation is "fighting" with the person's own need for recognition and personal success. It makes sense that a manager who wants the glory more than they care about the well-being of others will have morale, turnover, customer service, and problems that result from pushing others away because of a need for control.

The final difference lies in the person's attention balance, which indicates the overall comparison of the manager's world thinking in comparison to the self thinking. A score of 3 indicates that the person is easily able to think about what others need and want while being unable to easily identify or think about what they need, want, or deserve. When people with this orientation are in stress-filled situations, their "self-foundation" is shaky and they typically overreact (excessively anxious, dogmatic, defensive, sensitive, or avoidance of problems). In most cases the difference between good and poor managers only lies in how they function or don't function when in stress-filled situations or facing high stress problems.

The following chart summarizes the ZERORISK scores derived from this study:

Scores that Indicate Potential Problems

Empathy	< 6
All Three World Scores	
Empathy	< 6
Practical / Results	> 6 and
Structured / Adherence	> 6

Empathy and	< 6 and
Outer Self/Self Assessment	> 6
Attention Balance	> 1.7

Criminal versus Non-Criminal Study

This criminal versus non-criminal validation, which was conducted by Drs. Mark Moore and Phil King, compares convicted criminals with the normal population and analyzes the differences between these two groups.

The study assumes 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 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.

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 and 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, i.e., 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):

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 and are not able to be effective in society. It provides an objective, resultant behavioral criterion against which the scores are compared. Since few people will have cause to ever 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.

Obtaining Custom Criterion Validations (Hiring Benchmarks)

The majority of the validation (benchmark) studies we conduct with clients are criterion-based validation studies. To conduct a criterion-based benchmark study on a job title please contact our Service Team at service@zeroriskhr.com. Make them aware of the job title/s you want to

analyze, the performance metric/s you're wanting to base your A, B, and C performers against (i.e. turnover, sales, customer retention, safety, theft/shrinkage, injuries, agile development time, net promoter scores, etc.) and the approximate number of people included in the analysis. A member of our service team will reach back out to get the validation study process started.

Once the validation study is completed you will receive a report and debrief of the findings and the resulting successful hiring benchmark will loaded in your account to compare future candidates and/or internal employees against to determine job fit.

Obtaining Custom Predictive Validations (Hiring Benchmarks)

The ZERORISK Hiring System is intended for use as a tool in the employee interviewing and selection process. It should not be used as a screen to make a hire/don't hire decision *unless* predictive validity for the particular position has been established. Establishing predictive validity for a particular position essentially proves that the instrument is effective in predicting success in that position and generally demonstrates its job relatedness and business necessity.

Predictive validity is a measure of an instrument's precision and usefulness in being able to predict, prior to the person's working in that position or acting in that specific role, whether given individuals will be successful. It follows the process of predicting a person's future success in a particular job or position based on his or 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. Predictive validity can be established for virtually any position in any company through a custom validation study (provided a large enough number of people occupy that position).

Obtaining predictive validity of the ZERORISK Hiring System for an important position within your organization can provide substantial benefits. By establishing target scores for the various thinking facets measured by the instrument, your hiring process will intuitively take into consideration many peculiarities of the job—and what it takes to succeed in the job—that it would be infeasible if not impossible to identify and select. This will result in a higher

performing workforce with lower turnover rates than you are likely to experience without using the ZERORISK Hiring System as a screen.

Establishing predictive validity with a custom validation can be economical. It involves following some specific steps for collecting data over a period of time followed by a statistical analysis of the data. Once you set up the process, as discussed below, it requires very little time or effort.

The time period necessary to accumulate adequate data for a valid study depends on the number of applicants there are for the position and how long it takes to verify whether they are successful in the position. If, for example, turnover in the position you are validating is 100 percent per year, then less than 2 years may be a sufficient period of time for the study (assuming an adequate number of employees). If the position typically turns over within 18 months (when the person is not successful), then a 3-year time span is usually adequate.

The number of profiles needed also varies. The greater the differences in scores between those who succeed and those who do not, the smaller is the required sample size. For example one predictive study involved 50 people over a 3-year period; a different study involved 60 participants over a 3-year period.

All ZERORISK Hiring Custom Validation studies follow industry-standard procedures for statistical analysis and comply with the American Psychological Association's guidelines for analysis of psychometric instruments.

Predictive Validation Process

The process is simple, and your ZERORISK Hiring Account Executive will be happy to work with you to set it up. The five steps are summarized below.

Step 1: Determine feasibility and scope. The first step is to discuss with your Account Executive the scope and objective of the study. After collecting the information necessary to

analyze your needs, your Account Executive will work with our ZERORISK Hiring System staff and advisors to determine the feasibility of your study. If the study's objective can, in the view of our team, be reasonably achieved, your Account Executive will provide a written proposal specifying the cost and providing an estimate of the required time frame for the study.

Step 2: Set-up. Once you agree to the terms outlined in the Study Proposal, your Account Executive will schedule an initial meeting with you to set up the study. This will entail developing score parameters and reviewing the recordkeeping requirements to provide a valid study. Three sets of predictive score parameters will be established: one group for which success is predicted, one group for which success is likely, and one for which failure is predicted. This meeting will occupy approximately half a day.

Step 3: Profiling and recordkeeping. You will have every employee hired for the job complete the ZERORISK HR assessment, and you will print his or her Candidate Profile and Interview Guide. The predictive scores established in Step 2 must not be communicated to the managers or supervisors who will make hiring decisions during the course of the study. As long as they are not told the predictive scores, managers can use the Candidate Profile and Interview Guides generated by the software to guide their hiring decisions during while the study is underway. These printed Profiles are kept on file during the course of the study.

Step 4: Adjusting predicted scores. The data is reviewed with your Account Executive after approximately 6 months. Performance of the test subjects is discussed and, if necessary, the predicted score ranges are adjusted.

Step 5: Statistical analysis and report writing. After the time period established in the first step has elapsed, the data will be provided to ZERORISK HR, Inc. for analysis by a statistician (ZERORISK HR uses highly qualified independent contractors for this work). If the statistician concludes that the data is adequate for credible statistical analysis, the data collection process ends, a statistical analysis is performed, and your report is prepared. If the statistician concludes that there are not enough data, you will resume the Profile and recordkeeping function to acquire more data. You will be advised specifically as to the additional time and number of profiles

needed. Once a sufficient amount of data is collected, that data will be provided to the statistician for analysis and preparation of the report.

Conclusion

The cornerstone Formal Axiological instrument employed by ZERORISK Hiring System is the Hartman Value Profile. During the past 15 years, 19 individuals have studied the Hartman Value Profile's validity. Their validation studies demonstrate that the Hartman Value Profile is reliable and valid and that it is useful in multiple applications for industry and the social sciences. Many of these studies also found that it does not discriminate on the basis of age, sex, or race.