



Technical Manual

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A Special Note to Profiles Performance Indicator Users

The Profiles Performance Indicator™ is well researched, demonstrates high reliability and has been favorably validated with established personality assessments. It has proven highly effective in helping supervisors to train, communicate, build teams and supervise their employees. However, **we do not recommend that Profiles Performance Indicator be used for hiring.**

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CHAPTER ONE

Introduction

History of the DISC Model Theory and Questionnaire Development

DISC Model Theory

The DISC Model Theory is not a recent development. As long ago as 1928, Dr. William Moulton Marston published the “Emotions of Normal People” in which he described it. The DISC language and the descriptive categories that make possible the practical application of his theory were derived from Dr. Marston’s work.

According to Dr. Marston’s DISC theory, behavior can be described by four primary dimensions, namely:

Dominance (D)

Inducement (I), also called “Influence”

Steadiness (S)

Compliance (C), also called “Cautiousness” and “Conscientiousness”

Every individual has one core or basic dimension and most behavior is a result of a combination of two or more of these dimensions¹.

Development of Marston Based DISC Questionnaires

Dr. Marston never developed a DISC measuring instrument. It was not until the 1950’s that Walter Clark developed an instrument based on Marston’s theory. This instrument was entitled the “Activity Vector Analysis.”

Since the development of the “Activity Vector Analysis,” and particularly beginning in the 1970’s, an ever increasing number of DISC measuring instruments have become available. Most of these instruments share a common ancestry. For example, two of the more commonly used Marston based instruments are the “Style Analysis²” and the

¹ A more comprehensive, detailed description of the DISC Theory can be found in O’Connor, M. (1987). *The DISC Model, Trainer and Consultant Reference Encyclopedia*. Life Associates, Inc.

² Bonnstetter, B., Suiter, J. and Widrick, R. (1993). *The Universal Language DISC: A Reference Manual*. Target Training International, Ltd.

“Personal Profile System³.” Both of these instruments are forced choice, most-least adjective checklist questionnaires. Both contain 24 or 28 sets of four adjectives derived from the Marston DISC Model Theory. Both contain most of the same adjectives, arranged in the same order. Both questionnaires require an individual to select one “most like me” and one “least like me” adjective from each set of four.

An individual’s DISC scores are then plotted on three graphs. Graph I contains the individual’s “most” responses. Graph II contains the “least” responses and Graph III contains the net difference between the “most” and “least” scores. Any one or more of these graphs have been used to identify and interpret an individual’s DISC profile or behavioral style. DISC theory profiles have been used for:

- * Team building
- * Career guidance and career path planning
- * Coaching and counseling
- * Training and management development
- * Interpersonal conflict resolution

Although there is no shortage of different Marston based DISC questionnaires, there is a critical shortage of technical and statistical data which support the development, validity and reliability of these questionnaires. In addition, what data, conclusions and recommendations that are available for review, are typically not clear or conclusive.

Objectives of the Profiles Performance Indicator™ Questionnaire Technical Manual

This technical manual summarizes the results of the development and statistical analysis of a new personality questionnaire entitled the “Profiles Performance Indicator™.” This technical manual includes an analysis of the construct validity and scale reliabilities of the Profiles Performance Indicator™ Questionnaire and summarizes the analysis of a new dimension entitled “Motivational Energy.”

³ Personal Profile System, Carlson Learning Company, 1994.

CHAPTER TWO

Development of the Profiles Performance Indicator™ Questionnaire

Selection of Items for the Profiles Performance Indicator™ Questionnaire

A panel of assessment practitioners, trainers, personnel consultants and psychologists served as the subject-matter experts. All of these panel members had extensive knowledge and experience with various personality measuring instruments and related materials. Personnel Research Associates, Inc. of Dallas, Texas, a psychological consulting firm, was retained to help develop the Profiles Performance Indicator™ Questionnaire and to coordinate the necessary statistical analysis.

The panel members participated in an in-depth review of current personality measuring instruments, technical reports and training materials. This review resulted in a list of 50 potential items for each of the Profiles Performance Indicator™ Questionnaire Scales. The total number of items was then reduced to 30 for each scale using the following process.

The final selection of questionnaire items was based on the following criteria:

- ★ **Deletion of vague and ambiguous items:** A review of DISC type questionnaires indicated that most of these questionnaires contain items that are highly vague and ambiguous. For example, two of these questionnaires contain the following items:

Obliging	Amicable
Cordial	Satisfied
Willing	Jovial
Eager	Animated
Lenient	

These items are vague and have too much surplus meaning — “willing” to do what?, “eager” to do what? “satisfied” with what? In addition, other vague items such as “magnetic,” “stimulating,” “refined” and “unconquerable” were not regarded as acceptable items for the Profiles Performance Indicator™ Questionnaire.

- ★ **Deletion of negative items:** The manner in which a set of four items is combined can cause problems with regard to producing a balanced and accurate representation of responses.

Example 1, which is common to most DISC theory questionnaires, contains a set of four items that clearly illustrate this problem. In this example, a respondent is required to select one “Most” and one “Least” item from this set of positive and negative items. These negative items will produce a biased response by most people’s preference for positive items. The end result is a skewed or distorted DISC profile.

Example 1		
Most	Least	
<input type="checkbox"/>	<input type="checkbox"/>	Fussy
<input type="checkbox"/>	<input type="checkbox"/>	Obedient
<input type="checkbox"/>	<input type="checkbox"/>	Firm
<input type="checkbox"/>	<input type="checkbox"/>	Playful

Therefore, negative items such as “obedient,” “easy mark,” “humble,” “argumentative,” “stubborn,” “gives in” were not considered as acceptable items for the Profiles Performance Indicator™ Questionnaire.

- ★ **Avoidance of gender-related items:** In addition to ambiguous and negative items, gender-related or biased items such as “charming,” “delightful,” “captivating,” “appealing,” “sweet” were not included in the Profiles Performance Indicator™ Questionnaire.
- ★ **Compatible with the Marston DISC Model Theory:** This criterion is compatible with all consultants and trainers who have developed and used handout, workbook and transparency materials based on the DISC Model Theory. This criterion will ensure that all Profiles Performance Indicator™ practitioners can continue to use materials developed on Marston’s theory.
- ★ **Compatible with business people:** Although the Profiles Performance Indicator™ Questionnaire can be used successfully with any individual or group of individuals, it was the intention of the panel to focus on items that were compatible with business people and business environments. The primary objective of this criterion was to insure that decisions with regard to team building, training, communication and career guidance would be based on a DISC theory measurement tool that was compatible with these types of decisions and with which business people felt comfortable.

The final result of this process was the identification and selection of 30 items for each of the Profiles Performance Indicator™ Scales, resulting in a total of 120 items.

Most - Least Response Technique

Most DISC theory questionnaires utilize a forced-choice, one most-one least response technique. This technique creates several very serious problems.

First, it cuts in half the number of most-least comparisons that can be made, which impacts the reliability and validity of the questionnaire. The primary factors that affect the reliability of a test are the clarity of the test items and the length of the test. As a rule of thumb, the longer a test, the more reliable it tends to be. This problem helps to explain why the reliability coefficients related to Scale “I” and “C” for most DISC theory questionnaires are consistently well below professionally acceptable standards.⁴

Second, the most-least technique restricts the distances that separate the DISC profile scale scores from each other. As a result, it is frequently difficult to arrive at any decisive conclusion regarding the differences among DISC scale scores for one person and differences in DISC scale scores between two or more people. This restriction of range between scale scores can create profiles which are flat and ambiguous.

The Profiles Performance Indicator™ Questionnaire requires a respondent to rank order the four items within each set. Each item represents one dimension. As a result, 30 sets of four items each produce scores on scales that range from 30 to 120. This wide range of scores not only enhances the reliability and validity of the scales, but also generates Profiles Performance Indicator™ profiles which are precise and explicitly defined. This wide range of scale scores should eliminate most undershifts, overshifts and tight profiles. Finally, profile patterns can be based on raw scores as opposed to “segment numbers,” “energy lines,” and other vaguely defined “norms.”

The Profiles Performance Indicator™ reports the four primary dimensions as numbered scales. The scales relate directly to the DISC model theory. Scale I of the Profiles Performance Indicator equates to the traditional Dominance scale; Scale II equates to the traditional Influence scale; Scale III equates to the traditional Steadiness scale; and Scale IV equates to the traditional Compliance scale.

⁴ Most professional test developers agree that a reliability coefficient should be greater than .70.

CHAPTER THREE

Statistical Analysis of the Profiles Performance Indicator™ Questionnaire: Phase One

Sample

The Profiles Performance Indicator™ Questionnaire was administered individually and in small groups to 334 participants. The sample consisted of a cross section of ages, income levels, educational levels and an even distribution of gender. All participants were employed in a diverse range of positions, companies and industries.

Results

Descriptive Statistics

Table 1 contains the average scores, standard deviations, minimum and maximum scores and the range of scores for the four Profiles Performance Indicator™ Questionnaire scales.

Table 1: Descriptive Statistics for the Profiles Performance Indicator™ Questionnaire (n=334)				
Profiles Performance Indicator™ Questionnaire				
	I	II	III	IV
Average Score :	79	73	78	70
STD Dev. :	16	12	15	11
Min. Score:	39	38	42	46
Max. Score :	115	103	114	105
Range of Scores:	76	65	72	59

Reliability Analysis

No measure can be of much value unless it measures in a reliable or consistent manner. Reliability refers to the consistency of test scores obtained by the same person when

retested with the same test on different occasions. Since all types of reliability are concerned with the degree of consistency between two independently derived sets of test scores, they can all be expressed in terms of a correlation coefficient.

A correlation coefficient expresses the degree of relationship between two variables. This relationship is expressed as a decimal number ranging from .00 to 1.00 where 1.00 indicates perfect reliability and .00 indicates the absence of reliability. Although no test is a perfectly reliable instrument, test reliability correlation coefficients should be in the .70's, .80's and .90's.

Split-Half Reliability Analysis

Each of the 30-item Profiles Performance Indicator™ Questionnaire scales was divided into two equivalent halves of 15 odd and 15 even numbered items. A split-half reliability correlation coefficient was calculated to provide a measure of consistency with regard to the content of the questionnaire items. That is, the split-half reliability coefficient would indicate how consistently the Profiles Performance Indicator™ Questionnaire items measure the DISC dimensions for which it was developed to measure.

Table 2 contains the split-half reliability coefficients for the Profiles Performance Indicator™ Questionnaire.

	Profiles Performance Indicator™ Questionnaire				
	I	II	III	IV	Average
Split-Half Reliability Coefficients	.85	.81	.88	.77	.83

According to Table 2, the four reliability correlation coefficients clearly indicate that the Profiles Performance Indicator™ Questionnaire is a highly reliable measuring instrument. Reliability coefficients range from .77 (IV Scale) to .88 (III Scale). The average reliability coefficient for the Profiles Performance Indicator™ Questionnaire was .83.

Coefficient Alpha Reliability Analysis

Coefficient alpha is another statistical measure of reliability. It is a statistic that indicates the consistency of responses to individual test items. The higher a test's coefficient alpha, the more consistent the items are for that test. A test with a low coefficient alpha is a test that produces different or inconsistent scores each time the same person takes the test. A high coefficient alpha, however, indicates that the test produces similar or consistent scores each time the same person takes the test.

Table 3 contains the coefficient alpha correlations for the Profiles Performance Indicator™ Questionnaire.

Table 3: Coefficient Alpha Reliability Correlation					
Coefficients for the Profiles Performance Indicator™ Questionnaire					
(n=334)					
Profiles Performance Indicator™ Questionnaire					
	I	II	III	IV	Average
Coefficient Alpha	.89	.82	.89	.79	.85

According to Table 3, the coefficient alpha correlations range from .79 (IV Scale) to .89 (I and III Scales). The average coefficient alpha for the Profiles Performance Indicator™ Questionnaire was .85. Therefore, the coefficient alpha reliability analysis not only supports the split-half reliability analysis but clearly indicates that the Profiles Performance Indicator™ Questionnaire is a highly reliable measuring instrument.

Profiles Performance Indicator™ Questionnaire Item Analysis

Frequency Distribution of Responses

The process of developing a personality test does not end with the initial administration of the test to a sample of people. Test developers should conduct a preliminary analysis to determine which test items are functioning as they should. Both the validity and reliability of any test depend on the characteristics of its items. High reliability and validity can be built into a test in advance through item analysis, and can be improved through the selection, substitution, or revision of items.

An item analysis of the Profiles Performance Indicator™ Questionnaire was conducted to determine the frequency distribution of 4, 3, 2, and 1 responses for the 120 Profiles

Performance Indicator™ items. If a large percent of the total sample assigned a rank of 4, 3, 2 or 1 to any one or more of the Survey items, these items would have to be regarded as excess baggage in the Questionnaire. That is, these items provide limited information about individual differences and contribute very little to the validity and reliability of the Profiles Performance Indicator™ Questionnaire.

Table 4 summarizes the results of the item analysis.

Table 4: Average Percent of Responses in the Total Sample (n=334) for the 120 Profiles Performance Indicator™ Items					
Profiles Performance Indicator™ Questionnaire					
Response Choices		I	II	III	IV
Most Like Me	4	31%	22%	28%	20%
	3	23%	26%	26%	25%
	2	22%	26%	26%	24%
Least Like Me	1	24%	26%	20%	30%

Table 4 indicates that the Profiles Performance Indicator™ Questionnaire produced a fairly well balanced representation of 4, 3, 2 and 1 responses for the 120 items. Scale I-related items received the largest percent of “most like me” responses (31%) whereas Scale IV-related items received the largest percent of “least like me” responses (30%). Inspection of the response distribution for the 120 items indicated that five of these items produced the largest percent of “least like me” responses. That is, 76% of the total sample selected “nit picker” and 71% selected “picky” as their “least like me” response. The additional three items were “poor loser” (64%), “thin skinned” (63%) and “fussy, hard to please” (61%). Apparently, these items were regarded as negative items by a majority of the participants. It was the opinion of the panel to delay any changes to the Profiles Performance Indicator™ Questionnaire until additional data become available for analysis.

CHAPTER FOUR

Statistical Analysis of the Profiles Performance Indicator™ Questionnaire: Phase Two

The primary objective of Phase Two was to replicate Phase One with a new sample of participants.

Sample

The Profiles Performance Indicator™ Questionnaire was individually and group administered to 317 participants. This sample was similar to the sample in Phase One with regards to demographics.

Results

Descriptive Statistics

Table 5 contains the Profiles Performance Indicator™ descriptive statistics for the 317 participants.

Table 5: Descriptive Statistics for the Profiles Performance Indicator™ Questionnaire - Phase Two (n=317)				
	Profiles Performance Indicator™ Questionnaire			
	I	II	III	IV
Average Score:	79	73	79	70
STD Dev.:	15	13	14	12
Min. Score:	44	39	44	43
Max. Score:	109	103	117	105
Range of Scores:	65	64	73	62

The average I, II, III, and IV scale scores in Table 5 are nearly identical to the average scale score reported in Phase One (See Table 1). Only one point separated the average scale scores from being identical. These highly consistent descriptive statistics are a direct result of the high reliability correlation coefficients that were obtained in Phase One.

Reliability Analysis

Table 6 contains coefficient alpha for the Profiles Performance Indicator™ Questionnaire.

Table 6: Coefficient Alpha for the Profiles Performance Indicator™ Questionnaire - Phase Two (n=317)					
Profiles Performance Indicator™ Questionnaire					
	I	II	III	IV	Average
Coefficient Alpha	.88	.84	.88	.81	.85

Table 6 clearly indicates that coefficient alpha for the four scales are nearly identical to those reported in Phase One (See Table 3). The coefficient alphas range from .81 (Scale IV) to .88 (Scales I and III). The average coefficient alpha was .85.

CHAPTER 5

Development and Statistical Analysis of the Motivational Energy (ME) Dimension

Introduction

All DISC theory measuring instruments contain a number of items that are intended to measure the DISC dimensions. The decision regarding which items to include in such a measuring instrument can be based on two sources of information, namely speculation or statistical analysis.

The Profiles Performance Indicator™ Questionnaire was developed using a statistical procedure called factor analysis. Factor analysis organizes questionnaire items into common groups or factors. This statistical procedure shows the relationship, if any, between each questionnaire item and the factors.

For example, Scales I, II, III and IV can be regarded as primary factors. Factor analysis of the 120 items contained in the Profiles Performance Indicator™ Questionnaire has demonstrated that these items are statistically related to and measure the primary DISC factors in a highly reliable and accurate manner.

Factor analysis of the Profiles Performance Indicator™ Questionnaire also identified a fifth factor, consisting of 37 Profiles Performance Indicator™ items. A review of these 37 items suggested that this fifth factor (Scale V) should be entitled “Motivational Energy” (ME). A detailed description of ME can be found in Chapter 6 of this manual. This factor was regarded as a second-order factor. Psychologically, a second-order factor is a broader dimension of personality. Therefore, a more complete description and understanding of any profile could be obtained by knowing the ME Scale score and the I, II, III and IV Scale scores.

Additional statistical analysis reduced the 37 ME items to 29. A scoring key was developed consisting of positive and negative weights. The ME score is the net difference between these 29 positively and negatively weighed items. This scoring key was used to score the Profiles Performance Indicator™ Questionnaire for the 317 participants.

Statistical Analysis of the Profiles Performance Indicator™ ME Scale

Descriptive Statistics

Table 7 contains the descriptive statistics for the ME scale (Scale V).

Table 7: Descriptive Statistics for the ME Scale	
(n=317)	
Profiles Performance Indicator™ Questionnaire	
	ME Scale
Average Score	: 34
STD Dev.	: 17
Min. Score	: -12
Max. Score	: 67
Range of Scores	: 79

Reliability Analysis

Coefficient alpha was calculated for the ME scale (Scale V). The Coefficient alpha correlation was .93. This finding indicates that ME is a highly reliable scale.

CHAPTER 6

Construct Validity Analysis of the Five Scales

Construct validity refers to the extent to which a psychological measure is an accurate measure of a particular construct. Construct validity addresses the question, “What does this measure really measure, and how well does it measure what it was designed for and purported to measure?”

Although there are different methods for determining the construct validity of a psychological measure, such as experts’ judgment and analysis of internal consistency (i.e. coefficient alpha), one of the most informative methods is to examine the correlation coefficients between the new psychological measure and other psychological measures that have been shown to measure the same or similar construct. That is, correlation coefficients between a DISC theory measuring instrument and other personality measures should show specific predictable relationships.

For example, Scale II of the Profiles Performance Indicator™ Questionnaire was designed for and is purported to be a valid measure of the construct “Influence.” According to Marston’s DISC model theory, “Influence” is directly related to “Sociability.” Therefore, evidence of construct validity for Scale II should include high correlation coefficients between Scale II and other “proven” psychological measures of “Sociability.”

Objective

The objective of this analysis is to provide evidence of construct validity for the Profiles Performance Indicator™ Questionnaire and ME scale (Scale V) by examining the pattern of correlation coefficients for these scales with two highly regarded personality measures and a measure of vocational interest.

Sample

The sample for Phase Two consisted of 317 participants.

Construct Validity Measures

In addition to the Profiles Performance Indicator™ Questionnaire, the 317 participants were administered the following three psychological measures:

- * Guilford-Zimmerman Temperament Survey (GZTS)⁵

The GZTS is a measure of normal, adult personality. It is based on more than 30 years of research and has been documented in over 2,000 books and journal articles. Occupational profile data and norms include more than 15,000 individuals. The GZTS contains ten personality scales. These scales include:

GZTS Scale	Description
General Activity	Fast vs. Slow
Restraint	Self control vs. Impulsivity
Ascendance	Dominance vs. Submissive
Sociability	Outgoing vs. Shy
Emotional Stability	High vs. Low
Objectivity	Objective vs. Subjective
Friendliness	Friendly vs. Aggressive
Thoughtfulness	Think It Through vs. Act It Out
Personal Relations	Positive vs. Negative
Masculinity	Interest in Masculine vs. Feminine Activities

⁵ Guilford, J.P., and Zimmerman, W.S. (1978). *The Guilford-Zimmerman Temperament Survey: Manual of Instructions and Interpretations*. Beverly Hills, CA: Sheridan Psychological Services, Inc.

*** Gordon Personal Profile - Inventory (GPP-I)⁶**

The GPP-I provides a comprehensive description of normal personality functioning through the measurement of eight personality traits. The GPP-I is a self report questionnaire, with items presented in a forced-choice format. The GPP-I has 40 years of research, documentation and use with a wide variety of business organizations and climates. The GPP-I measures the following eight personality traits:

GPP-I Scale	Description
Ascendancy	Active vs. Passive role in group situations
Responsibility	High vs. Low
Emotional Stability	High vs. Low
Sociability	Socially outgoing vs. Shy
Cautiousness	Careful vs. Impulsive
Original Thinking	Innovative vs. Conventional
Personal Relations	Positive vs. Negative
Vigor	High vs. Low Activity

⁶ Gordon, L.V. (1978). *Gordon Personal Profile - Inventory Manual*. New York: Harcourt Brace Jovanovich.

*** Vocational Preference Inventory (VPI)⁷**

The VPI is widely regarded as the standard of career interest inventories. The VPI has been successfully used by millions of people for more than 20 years. Reliability and validity of the VPI are supported by a large body of research.

The VPI measures the following six general occupational themes:

Theme	Description
Realistic	Mechanical, Outdoors
Investigative	Technical, Science
Social	Social welfare, Helping people
Conventional	Office
Enterprising	Sales, Business management
Artistic	Creative expression

The VPI is an indirect measure of personality. According to its developers, each of the six occupational themes is related to a specific personality type. People who share an interest in a specific occupational theme will also share a specific personality type. Table 8 summarizes the relationships between the six occupational themes and personality types.

Occupational Theme	Personality Type
Realistic	Practical, low key, unemotional
Investigative	Intellectual, unconventional
Social	People oriented
Conventional	Dependable, steady, consistent
Enterprising	Assertive, competitive
Artistic	Emotional, sensitive

⁷ Holland, J.L. (1970). *Vocational Preference Inventory Manual*. Palo Alto, CA: Consulting Psychologist's Press.

Results of the Construct Validity Analysis

Correlation Coefficients between the Profiles Performance Indicator™ Questionnaire and the Guilford- Zimmerman Temperament Survey

Table 9 contains the correlation coefficients of the Profiles Performance Indicator™ Questionnaire with the ten personality scales from the GZTS.

GZTS	PPI Questionnaire			
	I	II	III	IV
General Activity	.48		-.51	
Restraint		-.38		.32
Ascendance	.46		-.45	
Sociability		.35		-.38
Emotional Stability				
Objectivity				
Friendliness	-.41		.44	
Thoughtfulness				
Personal Relations				
Masculinity				

All Correlations are significant, p<.001.

A sample of 317 participants requires a correlation coefficient of .20 to demonstrate statistical significance at the .001 level. In order to amplify the most meaningful results in Table 9, correlation coefficients less than .30 were not included. Appendix A contains the correlation coefficients that are statistically significant at the .001 level.

Table 9 indicates the following results:

- * Scale I is significantly related to General Activity (.48), Ascendance (.46) and Low Friendliness (-.41)
- * Scale II is significantly related to Sociability (.35) and Low Restraint (-.38)
- * Scale III is significantly related to Low General Activity (-.51), Low Ascendance (-.45) and High Friendliness (.44)
- * Scale IV is significantly related to Restraint (.32) and Low Sociability (-.38)

These results are clearly in line with Marston’s DISC model theory and strongly support the construct validity of the Profiles Performance Indicator™ Questionnaire.

Correlation Coefficients between the Profiles Performance Indicator™ Questionnaire and the Gordon Personal Profile - Inventory

Table 10 contains the correlation coefficients of the Profiles Performance Indicator™ with the GPP-I.

Table 10: Correlation Coefficients of the Profiles Performance Indicator™ with the Gordon Personal Profile - Inventory				
(n=317)				
GPP-I	PPI Questionnaire			
	I	II	III	IV
Ascendancy	.36		-.39	
Responsibility				
Emotional Stability				
Sociability		.41		-.35
Cautiousness	-.35	-.43	.48	.31
Original Thinking				
Personal Relations			.37	
Vigor				

All Correlations are significant, p<.001.

Table 10 indicates the following results:

- * Scale I is significantly related to Ascendancy (.36) and Low Cautiousness (-.35)
- * Scale II is significantly related to Sociability (.41) and Low Cautiousness (-.43)
- * Scale III is significantly related to Cautiousness (.48), Personal Relations (.37) and Low Ascendancy (-.39)
- * Scale IV is significantly related to Cautiousness (.31) and Low Sociability (-.35)

These results are also compatible with Marston’s DISC model theory and support the construct validity of the Profiles Performance Indicator™ Questionnaire.

Correlation Coefficients Between the Profiles Performance Indicator™ Questionnaire and the Vocational Preference Inventory

Table 11 contains the correlation coefficients of the Profiles Performance Indicator™ with the VPI.

VPI	PPI Questionnaire			
	I	II	III	IV
Realistic				
Investigative				
Social				
Conventional	-.30		.34	.30
Enterprising		.31		
Artistic				

All Correlations are significant, $p < .001$.

Table 11 indicates that although the overall relationship between the Profiles Performance Indicator™ and the VPI was limited, Scale II was significantly related to the Enterprising theme (.31), Scale III (.34) and Scale IV (.30) were significantly related to the Conventional theme, and Scale I (-.30) was significantly related to the Conventional theme. These statistically significant correlation coefficients between the Profiles Performance Indicator™ Questionnaire and VPI are compatible with Marston’s DISC model theory.

Summary of the Construct Validity Analysis

Table 12 contains a summary of correlation coefficients of the Profiles Performance Indicator™ with the GZTS and GPP-I.

Table 12: Summary of the Correlation Coefficients of the Profiles Performance Indicator™ Questionnaire with the GZTS and GPP-I			
Profiles Per. Ind. Questionnaire	Correlation Coefficient	Personality Trait	GZTS GPP-I
Scale I	.48	General Activity	(G-Z)
	.46	Ascendance	(G-Z)
	.36	Ascendancy	(GPP-I)
	-.41	Friendliness	(G-Z)
	-.35	Cautiousness	(GPP-I)
Scale II	-.38	Restraint	(G-Z)
	.35	Sociability	(G-Z)
	.41	Sociability	(GPP-I)
	-.43	Cautiousness	(GPP-I)
Scale III	-.51	General Activity	(G-Z)
	-.45	Ascendance	(G-Z)
	-.39	Ascendancy	(GPP-I)
	.44	Friendliness	(G-Z)
	.48	Cautiousness	(GPP-I)
Scale IV	.32	Restraint	(G-Z)
	-.38	Sociability	(G-Z)
	-.35	Sociability	(GPP-I)
	.31	Cautiousness	(GPP-I)
All correlations are significant, $p < .001$.			

Table 12 clearly indicates that the Profiles Performance Indicator™ Questionnaire is a valid measure of Marston’s four dimensional model theory. The validity evidence for each of the Profiles Performance Indicator™ scales can be summarized as follows:

Construct Validity Evidence: Dominance

Marston’s DISC model theory states that people with a high “D” (Dominance) behavioral tendency seek to meet their needs by controlling their environment through direct, forceful action.

High “D” (Scale I) behavioral tendencies include:

- * getting immediate results
- * causing action
- * accepting risk
- * taking charge of people and situations

These behavioral tendencies are highly compatible with high General Activity, high Ascendance, low Friendliness, and low Cautiousness.

Construct Validity Evidence: Influence

People with a high “I” (Influencing) behavioral tendency seek to meet their needs by persuading others to work with them to accomplish results. High “I” (Scale II) behavioral tendencies include:

- * contacting people
- * emotionality
- * spontaneity
- * enthusiasm

These behavioral tendencies are highly compatible with high Sociability, low Restraint and low Cautiousness.

Construct Validity Evidence: Steadiness

People with a high “S” (Steadiness) behavioral tendency seek to meet their needs by cooperating with others in a steady, consistent manner. High “S” (Scale III) behavioral tendencies include:

- * maintaining the status quo
- * steady, deliberate performance
- * patient, easy going
- * team player, accommodating, agreeable

These behavioral tendencies are highly compatible with high Personal Relations, high Cautiousness, high Friendliness, low Ascendance and low General Activity.

Construct Validity Evidence: Compliance

Finally, Table 12 summarizes the evidence of construct validity for the “C” scale. People with a High “C” (Compliance) behavioral tendency seek to meet their needs by working with existing circumstances to provide quality and accuracy. High “C” (Scale IV) behavioral tendencies include:

- * high standards regarding quality and correctness
- * attention to details
- * more data than people oriented
- * guarded, highly controlled, disciplined

These behavioral tendencies are highly compatible with high Restraint, high Cautiousness and low Sociability. In conclusion, Table 12 clearly indicates that the Profiles Performance Indicator™ Questionnaire is a valid measure of Marston’s DISC dimensions and is highly compatible with his DISC model theory.

Construct Validity Analysis of the Motivational Energy Scale (Scale V)

It was stated earlier in this manual that a factor analysis of the Profiles Performance Indicator™ Questionnaire identified a fifth factor consisting of 29 Profiles Performance Indicator™ items. A review of these 29 items indicated that this factor, Scale V, should be called “Motivational Energy.” A scoring key for Scale V was developed and used to score the Profiles Performance Indicator™ Questionnaire for 317 individuals who participated in Phase Two. In addition to the Profiles Performance Indicator™ Questionnaire, the 317 participants were also administered the Guilford-Zimmerman Temperament Survey, the Gordon Personal Profile - Inventory and the Vocational Preference Inventory.

Table 13 summarizes the correlation coefficients of the ME scale with GZTS, GPP-I and VPI.

Table 13: Summary of the Correlation Coefficients of the Profiles Performance Indicator™ ME Scale with the GZTS and GPP-I		
Scale V – ME Score		
Personality Trait	Correlation Coefficient	GZTS GPP-I
General Activity	.53	GZTS
Ascendance	.47	GZTS
Ascendancy	.39	GPP-I
Friendliness	-.38	GZTS
Cautiousness	-.33	GPP-I

All correlations are significant, $p < .001$.

Table 13 indicates that the ME scale is significantly related to:

- High General Activity
- High Ascendance
- Low Friendliness
- Low Cautiousness

The most interesting and informative relationship was between the Scale V and General Activity. According to the GZTS Handbook⁸, General Activity (G) is primarily a measure of energy level. A high “G” score indicates strong drive, energy and physical activity, with a tendency to do everything in a rapid pace. A high “G” person puts a large amount of energy into everything they do. A high G person is an energetic, fast moving high achiever who is capable of accomplishing more than most people.

The ME scale has the general effect of emphasizing the behavioral tendencies related to Scales I, II, III and IV. It can be thought of as an activator or catalyst of these behavioral tendencies. A high ME person is more likely to exhibit external evidence of his/her behavioral tendencies related to Scales I, II, III and IV. A high ME score can produce both positive and negative results. A high ME person does everything with more drive, energy and intensity - socializes more, more actively dominates others, shows more hostility, works harder, over controls everything, etc.

8 Guilford, J.S., Zimmerman, W.S. and Guilford, J.P. (1976) The Guilford-Zimmerman Temperament Survey Handbook. San Diego, Ca: EDITS.

In conclusion, ME can provide an illuminating backdrop for interpreting a person's Profiles Performance Indicator™ profile. Scale V provides a more complete picture of an individual.

When reviewing scores for Scales I, II, III and IV with the ME score in mind, a more specific representation of the individual becomes clear. Scale V can help to explain how two individuals with similar traditional DISC-type patterns can express significantly different behavioral tendencies while working under similar conditions.

CHAPTER 7

Statistical Analysis of the Profiles Performance Indicator™ Questionnaire: Phase Three

Sample

Phase Three combined the samples from Phase One (334) and Phase Two (317) into a total sample of 651 participants.

Results

Descriptive Statistics

Table 14 contains the descriptive statistics for the Profiles Performance Indicator™ Questionnaire.

Table 14: Descriptive Statistics for the Profiles Performance Indicator™ Questionnaire (n-651)				
	Profiles Performance Indicator™ Questionnaire			
	I	II	III	IV
Average Score	79	73	78	70
Std. Dev.	15	12	15	12
Min. Score	39	39	42	43
Max. Score	115	103	117	105
Range of Scores	76	64	75	62

Coefficient Alpha Reliability Analysis

Table 15 contains the coefficient alpha correlations for the Profiles Performance Indicator™ Questionnaire.

Table 15: Coefficient Alpha Reliability Correlation Coefficients for the Profiles Performance Indicator™ Questionnaire (n=651)					
Profiles Performance Indicator™ Questionnaire					
	I	II	III	IV	Average
Coefficient Alpha	.89	.83	.89	.80	.85

Table 15 indicates that coefficient alpha ranged from .80 (Scale IV) to .89 (Scales I & III). The average coefficient alpha for the Profiles Performance Indicator™ Questionnaire was .85.

Profiles Performance Indicator™ Questionnaire Item Analysis

Frequency Distribution of Responses

Phase One included an item analysis of the Profiles Performance Indicator™ Questionnaire. This analysis focused on the frequency distribution of 4, 3, 2, and 1 responses for the 120 Profiles Performance Indicator™ items. The item analysis indicated that five of these items produced a highly skewed percent of “least like me” responses. It was the opinion of the panel to delay any changes to the Profiles Performance Indicator™ Questionnaire until additional data became available. Phase Three provided the opportunity to replicate the item analysis on a larger sample.

Table 16 compares the percent of “Least like me” responses for Phase One with the percent of “Least like me” responses for Phase Three for these five questionnaire items.

PPI Items	% Least Like Me Response			Revised Item
	Phase One	Phase Three		
Nitpicker	76%	77%		Very selective
Picky	71%	71%		Picky, Discriminating
Poor Loser	64%	63%		Likes to win
Thin Skinned	63%	65%		Feelings easily hurt
Fussy, hard to please	61%	60%		Hard to please

Table 16 indicates that the highly skewed percent of “Least like me” responses did not change in spite of a significant increase in sample size. These five items do not provide much information about individual differences and contributed very little to the validity and reliability of the Profiles Performance Indicator™ Questionnaire. As a result, these five items were revised. The primary objective of this revision was to create items that would result in a more balanced representation of 4, 3, 2, and 1 responses. As a result, revisions were made that maintained the basic meaning of the item, but reduced or eliminated its negative connotations. These revised items appear in Table 16.

CHAPTER 8

Summary of Results and Conclusions

Overview

This technical manual summarized the results of the development and statistical analysis of a questionnaire entitled Profiles Performance Indicator™. The Profiles Performance Indicator™ Questionnaire was designed to be a valid and reliable measure of the four primary dimensions from William Marston's DISC Model Theory, published in 1928.

Although there are a number of Marston based DISC questionnaires currently available, there is a critical shortage of technical and statistical data which support the development, validity and reliability of these questionnaires.

Phase One included 334 participants and focused on the development and analysis of the Profiles Performance Indicator™ Questionnaire. This analysis included a detailed item analysis of the 120 questionnaire items, descriptive statistics and reliability statistics.

Phase Two included 317 participants and was concerned with the construct validity of the Profiles Performance Indicator™ Questionnaire. Evidence of construct validity was determined by examining patterns of correlation coefficients of the Profiles Performance Indicator™ Questionnaire with two measures of personality and a measure of vocational interest.

Phase Two also summarized the development and statistical analysis of a new dimension entitled "Motivational Energy" (Scale V). Construct validity evidence for Scale V indicated that it is a measure of General Energy or Activity, and can be regarded as an energizer or intensifier of DISC behavioral tendencies.

Phase Three contained a replication of the item analysis summarized in Phase One, and the descriptive and reliability statistics for the 651 individuals who participated in Phase One and Phase Two.

Summary

1. Reliability of the Profiles Performance Indicator™ Questionnaire

Table 17 contains the Average Profiles Performance Indicator™ Scale Scores for Sample One (n=334), Sample Two (n=317) and the Combined Sample (n=651).

Table 17: Average Profiles Performance Indicator™ Scale Scores for Sample One (n=334), Sample Two (n=317) and Combined Sample (n=651)				
PPI Questionnaire	I	II	III	IV
Sample One (n=334)	79	73	78	70
Sample Two (n=317)	79	73	79	70
Combined Sample (n=651)	79	73	78	70

Table 18 contains coefficient alpha reliability correlations for Sample One (n=334), Sample Two (n=317) and the Combined Sample (n=651).

Table 18: Coefficient Alpha Reliability Correlations for Sample One (n=334), Sample Two (n=317) and Combined Sample (n=651)					
PPI Questionnaire	I	II	III	IV	Average
Sample One (n=334)	.89	.82	.89	.79	.85
Sample Two (n=317)	.88	.84	.88	.81	.85
Combined Sample (n=651)	.89	.83	.89	.80	.85

Table 17 and particularly Table 18 clearly indicate that the Profiles Performance Indicator™ Questionnaire produces highly reliable and consistent results. This high consistency of results can be attributed to several features that were built into the design of the Profiles Performance Indicator™ Questionnaire.

First, the reliability of any measuring instrument is influenced by the clarity or lack of clarity of its items. The 120 items of the Profiles Performance Indicator™ Questionnaire were included only if each item satisfied a stringent set of criteria. Negative items, vague and ambiguous items and gender-related items were not included in the Profiles Performance Indicator™ Questionnaire.

Second, the reliability of a measuring instrument can be influenced by the length of the instrument. DISC theory questionnaires that contain 24 sets of four items each appear to have 24 items for each scale. Closer inspection of these scales, however, indicates that many of these items are regarded as “neutral” items and do not contribute to the final scale score.

For example, the “C” scale of a frequently used DISC theory questionnaire contains 12 “most like me” neutral items. In addition, if it is safe to infer that negative items produce a biased response by most individual’s preference for positive items, the “True” length of this scale is not 24, but rather 10 items. It is extremely difficult for any type of ten-item measuring instrument to produce reliable results. Without reliability, there is very little validity. This finding helps to explain why the most reliable and consistent feature of many questionnaires based on Marston’s DISC theory is their lack of reliability and their inconsistency of results.

The Profiles Performance Indicator™ Questionnaire contains 30 sets of four items per set. Each item represents one Profiles Performance Indicator™ scale and every item is included in the scoring. Therefore, 30 sets of four items each produce Profiles Performance Indicator™ scale scores that range from 30 to 120. This wide range of scale scores not only contributes to the reliability of results, but also produces Profiles Performance Indicator™ profiles which are clearly defined and distinct.

2. Construct Validity Analysis

Evidence of construct validity clearly and consistently indicated that the Profiles Performance Indicator™ Questionnaire is a valid measure of the DISC model theory dimensions. Patterns of statistically significant correlation coefficients of the Profiles Performance Indicator™ Questionnaire with highly regarded and valid measures of personality strongly supported this conclusion. The “Dominance” scale of the Profiles Performance Indicator™ Questionnaire was significantly related to General Activity, Ascendance, Aggressiveness and Risk Taking. The “Influence” scale was significantly related to Sociability, Impulsivity and Risk Taking. The “Steadiness” scale was significantly related to Submissiveness, Friendliness, Cautiousness and Personal Relations. Finally, the “Compliance” scale of the Profiles Performance Indicator™ Questionnaire was significantly related to Introversion, Cautiousness and Restraint. These personality traits are not only significantly related to the Profiles Performance Indicator™ scales, but also represent the most critical behavioral tendencies of the DISC model theory.

3. Analysis of Scale V: the Motivational Energy Scale (ME)

Factor analysis of the Profiles Performance Indicator™ Questionnaire identified a second order or higher order factor consisting of 29 items. These 29 items tended to share a common theme which was entitled “Motivational Energy” (ME).

A construct analysis was conducted by examining the pattern of correlation coefficients of ME with scores from the two personality measures used to determine the construct validity of the Profiles Performance Indicator™ Questionnaire.

The results of this analysis indicated that Scale V (ME) was significantly related to General Activity, Ascendance, Aggressiveness and Risk Taking.

A review of the 29 ME items combined with the results of the construct validity analysis indicated that ME was more than just a fifth scale. That is, ME can be regarded as a much broader scale that consists of a common theme or common denominator that cuts across the four Profiles Performance Indicator™ scales. The ME scale should not be considered as a replacement for or as more important than any one or more of the Profiles Performance Indicator™ scales. But when used in conjunction with the Profiles Performance Indicator™ scales, it provides a more comprehensive, in-depth picture of an individual. This is clearly a “plus” for those using the survey.

**Appendix A: Correlation Coefficients of the Profiles Performance Indicator™
Questionnaire with the Guilford-Zimmerman Temperament Survey (GZTS),
Gordon Personal Profile - Inventory (GPP-I) and Vocational Preference Inventory
(VPI)
(n=317)**

Profiles Performance Indicator™ Questionnaire

	I	II	III	IV
GZTS				
General Activity	.48	.26	-.51	-.27
Restraint		-.38	.16	.32
Ascendance	.46		-.45	
Sociability		.35		-.38
Emotional Stability				
Objectivity				
Friendliness	-.41		.44	
Thoughtfulness				
Personal Relations				
Masculinity				
GPP-I				
Ascendancy	.36	.30	-.39	-.30
Responsibility			.24	
Emotional Stability			.37	
Sociability		.41	-.22	-.35
Cautiousness	-.35	-.43	.48	.31
Original Thinking				
Personal Relations	-.29		.37	
Vigor				
VPI				
Realistic				
Investigative				.19
Social	-.21	.20		
Conventional	-.30	-.29	.34	.30
Enterprising		.31		-.23
Artistic	-.29	.21		

All correlations are significant, $p < .001$; $n = 317$