

# The Emergenetics Profile Technical Report

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The following sections provide background information to help participants understand the theoretical background, research, and development of the Emergenetics Profile.

## Introduction

Recognizing the need for a practical and easy to apply business personality tool that followed the Standards for Educational and Psychological Testing, R. Wendell Williams, PhD and Geil Browning, PhD, began a project in the late 1980's to discover the most prevalent thinking and behavioral preferences of healthy working adults. They searched the literature for draft items, repeatedly administered surveys to participants attending personal development workshops, factor-analyzed the data, studied inter-item reliabilities, calculated homogenous item composites, and repeated the discovery process until the survey became psychometrically stable.

Seven factors proved robust. They were identified as preferences for thinking analytically, socially, structurally, and conceptually; and, exhibiting behaviors described as expressive, assertive, and flexible. Descriptions were later replaced with colors to minimize perceived undesirability. These factors became the foundation for the Emergenetics Profile (EP).

EP technical data include inter-item reliabilities between .71 and .83; ten-year test-retest reliabilities between .68 and .77; constructs validated with the Neo-FFI; and, 3<sup>rd</sup> party observer content validity correlations between .46 and .67. Most data were statistically significant at the  $p < .01$  level.

The current EP contains 100 items with scores normed against a population of over 100,000 adults. Subjects completing the profile learn the basic strengths and weaknesses of their own preferences; are able to compare themselves to others; better manage interpersonal differences; and, use this knowledge to become more productive.

The profile follows the tenets of socio-analytic theory which defines self-descriptive tests as a measure of how one chooses to present him or herself to the world. Thus, workshop participants are encouraged to think of their profiles as useful patterns that influence, but not necessarily constrain, personal interactions. As with all self-reported instruments, EP preferences are not intended to imply specific skills.

## Discussion of Theories and Factors

A quick review of personality instruments used in personal development workshops showed they typically fell into one of three categories: clinical, academic or lay instruments. While clinical instruments such as the MMPI are commonly used in business environments, they are more suited to DSM diagnostic classifications and not applicable to healthy people. Academically-developed instruments had a tendency to define the entire personality domain (e.g., CPI, B5 or HEXACO personality taxonomies). Lay instruments, the most commonly used of all business surveys (e.g. DISC, MBTI, and so forth) usually failed to follow professional test development standards, had unsupported theories, poor test-retest reliabilities, and/or weak to non-existent validity.

Needless to say, the authors of the EP felt there was a widespread need for adults to understand, and put to practical use, a fairly simple, yet robust set of personality factors developed according to professional test development standards. Therefore, they conducted a comprehensive review of the literature including decades of academic investigations, neurological factors associated with split-brain research, genetic and environmental factors identified in mono-zygotic twin-research, and job-related factors identified in assessment-center investigations.

This review produced an extensive list of potential items that were repeatedly administered to participants attending personal development workshops. After each administration, data were factor-analyzed, inter-item reliabilities were studied, and revisions made. Throughout the process, both rational and empirical methods were used to build homogenous item composites (i.e., a combination of rational and empirical items that define a specific personality space). When analyses showed the instrument was psychometrically stable, it was introduced into workshops where it was immediately well-received.

The authors never intended the EP to be an exhaustive trait taxonomy, nor did they intend to propose a new theory of personality. Rather, its purpose was to provide lay users with a robust research-backed framework of easily recognizable and eminently useful factors they could easily apply to work, communication, and interpersonal relationships. Combined with an accompanying workshop, participants learn how to:

- Use basic tools to improve job performance and improve communication.
- Understand basic motivational drivers within a work environment.
- Pinpoint strengths and interests based on a heightened knowledge of personal preferences.
- Understand how behavior affects others and translate this knowledge into more confidence and self-acceptance when working with others.
- Build a collaborative organizational workforce.
- Engage in meaningful dialogue and information about the way they go about their work.

Since its inception, the EP has followed professional validity and reliability standards outlined in the 1999 Standards for Educational and Psychological Testing. The EP report includes normative scores expressed as percentiles for four easily-recognizable thinking preferences as well as three common external behaviors. These include:

Preferences for:

- Analytical Thinking: problem solving, analysis, mathematical, and investigative interests
- Structure and Rules: rule following, administrative guidelines, traditional, methodical
- Social Concerns: collaboration, caring, giving, empathy

- Conceptualizing Ideas: unconventional, creative, unique, innovative
- Behavioral descriptions of:
- Expressiveness: ranging from quiet and reserved to outgoing and gregarious
- Assertiveness: ranging from peacekeeper and accepting to competitive and driven
- Flexibility: ranging from focused and firm to accommodating and easy going

Because it yields practical results that can be easily applied within any context, the seven EP principles can be used as a human resource framework on which to build hiring criteria, conduct performance management, provide multi-rater feedback, and facilitate developmental activities.

## Professional Test Developmental Criteria

### Introduction

A reputable developmental survey should meet the following criteria as outlined in the 1999 Standards for Educational and Psychological Testing:

- Items that load on a specific factor must be consistent with each other and with the factor score. This is called inter-item reliability.
- Factors within the test that are associated with each other should correlate, and ones that are independent should not. This is called convergent/discriminant validity.
- Scores on the survey should directly relate to the content, construct, or criterion it is supposed to measure. This is referred to as content, construct, or criterion validity. Since the EP is intended to be a criterion-neutral instrument, no studies of criterion-related validity were conducted.
- Subjects should agree items resemble “legitimate” questions. This is called face validity.

### Inter-item Reliability

Internal integrity of a survey begins by examining Cronbach’s Coefficient-Alpha for each factor. Coefficient-Alpha refers to the average of all possible inter-item and split-half correlations, both strong and weak, without relying on single indicators of reliability which may contain large amounts of error. The inter-item reliabilities of the Emergenetics Profile (N= 89,101) range from .71 to .83 and are shown in Table 1.

### Convergent/Discriminant Correlations

Once we know individual items have acceptable inter-item reliabilities, we can examine relationships between factors by examining both convergent and discriminant correlations. This step evaluates factor independence.

It should be noted that behavior is seldom “pure”. Like Venn diagrams, macro descriptions often cause some factor scores to co-vary with one another. For example, social assertiveness (i.e., Expressiveness) and task assertiveness (i.e., Assertiveness) both contain items that are related to assertiveness even though their goals are entirely different (e.g., accomplish tasks v. stand-out socially).

So, even though factors like Expressiveness and Assertiveness have considerable co-variance (as can be observed in the following convergent-discriminant correlation table), they are both included in the report

because they help subjects understand behavioral differences expressed by one attribute that are not explained by another. The following chart contains a summary of factor-level correlations.

### Convergent-Discriminant Correlations

Correlations

	Analytical	Social	Structure	Conceptual	Expressive	Assertive
Social	.090					
Structure	.029	.070				
Conceptual	.397	.367	-.464			
Expressive	.162	.649	-.196	.487		
Assertive	.316	.284	-.333	.502	.743	
Flexibility	.155	.858	-.001	.420	.718	.403

(N=89.101,  $p < .01$ )

Although a Convergent/Discriminant Correlation Table is an expected part of a technical manual, it reports data at the macro...not the granular... level. An examination of cross-tabulation tables is necessary to show interactions between factors at a more granular level. Tables 2-13 contain scores from 11,578 subjects re-coded into ranked percentiles (i.e., 0 to 33 = 1st, 34 to 66 = 2nd, and 67 to 100 = 3rd).

It's easy to see in Table 8, for example, that 49.6% of participants (n= 1965) who described themselves as high in Structure also had low Expressiveness scores; however, 12.4% of participants (n=492) with the same Structure score described themselves as high in Expressiveness. Similar granular differences between individual subjects illustrates why it's important to report all seven factors at the granular level even though they might show significant covariance at the macro level.

**Face Validity** refers to whether a survey-taker perceives the survey items to be credible. If thinking and behavioral preferences were to be measured, for example, asking questions about hobbies, vocations or religious preferences would seriously impair face-validity. Participants generally tell us the items are face-valid for describing general thinking and behavioral preferences.

**Construct Validity** refers to whether the survey evaluates a deep-seated construct such as emotional sensitivity or intelligence. Construct validity was examined using the Neo-FFI, a Big-5 preference model published by Psychological Assessment Resources, Inc., Lutz, Florida.

The NEO was developed by Paul Costa and Robert McCrae based on personality research conducted in the 1950's showing that virtually all personality factors tend to cluster into five general factors. The B-5 model is well-respected, widely researched and extensively used for vocational counseling, mental illness and behavior, defining coping systems, and the like. Correlations between EP and the Neo-FFI are found in Tables 14-26.

The NEO-FFI evaluates five domains, each consisting of four sub factors as follows:

1. Neuroticism (N): a compound score indicating the tendency to experience negative emotions such as fear, sadness, anger, disgust, embarrassment, and guilt.  
N1 (high sub-factor score): general anxiety, phobias, tense, jittery

- N2 (high sub-factor score): hostility, bitterness, anger, frustration  
 N3 (high sub-factor score): depression, guilt, sadness, hopelessness, loneliness  
 N4 (high sub-factor score): self-consciousness, sensitivity, inferiority, uncomfortable
2. Expressiveness (E): a compound score indicating preferences for liking people, being around large groups, being assertive and talkative, upbeat, energetic, and active.
    - E1 (high sub-factor score): warmth, affectionate, friendly, close attachments
    - E2 (high sub-factor score): gregarious, other company
    - E3 (high sub-factor score): dominant, forceful, social climbing
    - E4 (high sub-factor score): energy, active, fast moving, thrill seeker
  3. Openness (O): a compound score indicating active imagination, aesthetic sensitivity, inner feelings, variety, curiosity, and independence.
    - O1 (high sub-factor score): fantasy, imaginative, daydreamer, creative
    - O2 (high sub-factor score): aesthetic, art, beauty, music, poetry
    - O3 (high sub-factor score): inner feelings, emotive, emotional depth and intensity
    - O4 (high sub-factor score): willingness, try new things, novelty, variety
  4. Agreeableness (A): a compound score indicating sympathy and eagerness to help
    - A1 (high sub-factor score): trust, honest, well-intentioned
    - A2 (high sub-factor score): straightforwardness, frank, sincere, ingenuous
    - A3 (high sub-factor score): altruistic, concern for others, generous, helpful
    - A4 (high sub-factor score): compliance, withdrawn, forgive, deference
  5. Conscientiousness (C): a compound score indicating strong will, self-control, planning, organizing, purposefulness, and achievement.
    - C1 (high sub-factor score): competence, capable, sensible, prudent effective
    - C2 (high sub-factor score): order, tidy, well organized, planful
    - C3 (high sub-factor score): dutiful, ethical, conscientious, moral obligations
    - C4 (high sub-factor score): achievement, aspiration, diligent, driven

A quick examination of the Big-5 factors shows they are anything but simple... sub-factors in the same cluster are in fact often highly dissimilar and a product of empirical, not rational, classification. For example, the B-5 Conscientiousness factor contains both a planful element (C2) and a driven element (C4). However, notwithstanding the fact the two instruments may use different items to define their factors, items included in the EP convergent/discriminant analysis table indicates that being planful and being driven are negatively related.

Table 14, for example, actually shows C4 is correlated with the EP Analytical factor ( $r=.274$ ) and Table 15 shows C2 is correlated with the EP Structural factor ( $r=.543$ ). Thus, although all EP correlations with the NEO-PI B5 factors and sub-factors are shown in Tables 14-26, the most significant and rational findings require examination at the sub-factor level.

Table 14 also shows significant correlations between Analytical and five B5 sub-factors (i.e., E1, E3, C1, C3, and C4).

Table 15 Shows significant correlations between Structural and 13 B5 sub-factors (i.e., N1, N4, E1, E2, E3, E4, O1, O2, O3, O4, A1, A2, and C2).

Table 16 Shows significant correlations between Conceptual and 11 B5 sub-factors (i.e. N1, N4, E1, E3, E4, O1, O2, O3, O4, A1, and C2).

Table 17 Shows significant correlations between Social and nine B5 sub-factors (i.e., E1, E2, E3, E4, O1, O2, O3, A2, and, A3).

Table 18 Shows significant correlations between Expressiveness and five B5 sub-factors (i.e., E1, E3, C1, C3, and, C4).

Table 19 Shows significant correlations between Assertiveness and 11 B5 sub-factors (i.e., N2, N4, E1, E2, E3, E4, O3, A2, A3, A4, and C4).

Table 20 Shows significant correlations between Flexibility and 11 B5 sub-factors (i.e., E1, E2, E3, E4, O1, O2, O3, O4, A1, A3, and C1).

Correlations with the major B5 factors are shown in Tables 21-26.

As can be observed, the Emergenetics Profile shows strong correlations with both the NEO-FFI sub-factors and its main factors. This pattern provides evidence of construct validity with an established Big-5 personality instrument. Although it is a highly popular commercial instrument, correlations were not done with the MBTI typetypes because it does not meet professional test development standards.

**Content Validity** refers to the adequacy of the Emergenetics Profile to measure and predict the behavior it is supposed to measure. This type of external validity was confirmed by comparing Emergenetics Profile scores to ratings from independent observers. Raters selected by 78 Targets were asked to read a short description of each Emergenetics Factor and rate the Target using a 1-7 Likert scale.

Final scores were examined. Raters whose scores showed minimal variance between items were eliminated. The remaining scores were averaged for each Target, standardized and correlated with the Target's self-reported Emergenetics Profile. The results from the 65 remaining Targets who completed the survey with 3 to 7 raters each are shown below.

### Correlations Between Emergenetics Scores And Summary Ratings By Observers.

Factor	Correlation
Analytical	.460
Structural	.637
Social	.575
Conceptual	.567
Expressive	.673
Assertive	.563
Flexible	.428

(N=65, p<.01)

This analysis confirmed the seven Emergenetics factors are Content valid. That is, self-reported scores on the Emergenetics Profile reflect behaviors that can be observed by independent Raters.

### **Test-Retest Reliability**

A test-retest/longitudinal study of the Emergenetics Profile was conducted to determine if profile factors were stable over a long time span; i.e., would scores remain essentially the same if someone completed the profile years ago?

A test-retest reliability study included 191 Females and 117 Males. The subjects completed their first profiles in late 1993. A second set of profiles was completed by the same subjects about 10 years later in 2003. Means and SD's for the first and second administration are shown in Table 27. Bivariate correlations ranged between  $r = .68$  and  $r = .77$  depending on the factor (see Table 28). A separate test-retest analysis of 98 subjects using a one-way ANOVA (Table 29) showed six of the seven factors had no statistically significant difference in scores.

### **Normative Scores and Demographic Differences**

Because organizations tend to expand across all cultures and countries, regardless of the local environment, they share similar expectations for employee behavior and performance objectives even within the same company, department, city, or country. Because we believe it's increasingly important for people to understand and utilize their individual differences in a global work environment, EP survey raw scores are converted to global norms which are periodically updated every few years. Percentile means of subjects reporting age, ethnicity, gender, and education in 2012 can be found in Tables 31-33 of the Appendix.

### **Conclusion**

The data confirms the Emergenetics Profile instrument meets the criteria for face validity, external validity, split-half reliability, inter-item reliability, and test-retest reliability. It provides valuable information about robust practical thinking and behavioral preferences and stays up to date by gathering norms from tens of thousands of subjects worldwide. Workshop attendees around the world have reported the instrument provides a useful tool for improving interpersonal effectiveness, assembling work teams, enhancing presentations, accepting and appreciating the contributions of people with different preferences.

## Tables

**Table 1**  
**Inter-Item Reliabilities**

Emergenetics Factor	Coefficient Alpha
Analytical	.83
Structural	.71
Social	.76
Conceptual	.76
Expressiveness	.78
Assertiveness	.78
Flexibility	.79

(N=89,101)

**Table 2**  
**Analytical Rank\* Expressive Rank Cross Tabulation**

			Expressive Rank			Total
			1st	2nd	3rd	
Analytical Rank	1st	Count	1229	986	549	2764
		% within Analytical Rank	44.5%	35.7%	19.9%	100.0%
	2nd	Count	1696	1965	917	4578
		% within Analytical Rank	37.0%	42.9%	20.0%	100.0%
	3rd	Count	1203	1912	1121	4236
		% within Analytical Rank	28.4%	45.1%	26.5%	100.0%
Total	Count	4128	4863	2587	11578	
	% within Analytical Rank	35.7%	42.0%	22.3%	100.0%	

**Table 3**  
**Analytical Rank\* Assertive Rank Cross Tabulation**

			Assertiveness Rank			Total
			1st	2nd	3rd	
Analytical Rank	1st	Count	1390	923	451	2764
		% within Analytical Rank	50.3%	33.4%	16.3%	100.0%
	2nd	Count	1549	2043	986	4578
		% within Analytical Rank	33.8%	44.6%	21.5%	100.0%
	3rd	Count	865	1893	1478	4236
		% within Analytical Rank	20.4%	44.7%	34.9%	100.0%
Total	Count	3804	4859	2915	11578	
	% within Analytical Rank	32.9%	42.0%	25.2%	100.0%	



**Table 4**  
**Analytical Rank\* Flexible Rank Cross Tabulation**

			Flexible Rank			Total
			1st	2nd	3rd	
Analytical Rank	1st	Count	1207	1056	501	2764
		% within Analytical Rank	43.7%	38.2%	18.1%	100.0%
	2nd	Count	1494	2056	1028	4578
		% within Analytical Rank	32.6%	44.9%	22.5%	100.0%
	3rd	Count	996	1880	1360	4236
		% within Analytical Rank	23.5%	44.4%	32.1%	100.0%
Total	Count	3697	4992	2889	11578	
	% within Analytical Rank	31.9%	43.1%	25.0%	100.0%	

**Table 5**  
**Social Rank \* Expressive Rank Cross Tabulation**

			Expressive Rank			Total
			1st	2nd	3rd	
Social Rank	1st	Count	2383	1144	184	3711
		% within Social Rank	64.2%	30.8%	5.0%	100.0%
	2nd	Count	1482	2534	986	5002
		% within Social Rank	29.6%	50.7%	19.7%	100.0%
	3rd	Count	263	1185	1417	2865
		% within Social Rank	9.2%	41.4%	49.5%	100.0%
Total	Count	4128	4863	2587	11578	
	% within Social Rank	35.7%	42.0%	22.3%	100.0%	

**Table 6**  
**Social Rank \* Assertive Rank Cross Tabulation**

			Assertiveness Rank			Total
			1st	2nd	3rd	
Social Rank	1st	Count	1754	1320	637	3711
		% within Social Rank	47.3%	35.6%	17.2%	100.0%
	2nd	Count	1477	2296	1229	5002
		% within Social Rank	29.5%	45.9%	24.6%	100.0%
	3rd	Count	573	1243	1049	2865
		% within Social Rank	20.0%	43.4%	36.6%	100.0%
Total	Count	3804	4859	2915	11578	
	% within Social Rank	32.9%	42.0%	25.2%	100.0%	

**Table 7**  
**Social Rank \* Flexible Rank Cross Tabulation**

			Flexible Rank			Total
			1 <sup>st</sup>	2nd	3rd	
Social Rank	1st	Count	2713	951	47	3711
		% within Social Rank	73.1%	25.6%	1.3%	100.0%
	2nd	Count	927	3198	877	5002
		% within Social Rank	18.5%	63.9%	17.5%	100.0%
	3rd	Count	57	843	1965	2865
		% within Social Rank	2.0%	29.4%	68.6%	100.0%
Total		Count	3697	4992	2889	11578
		% within Social Rank	31.9%	43.1%	25.0%	100.0%

**Table 8**  
**Structure Rank \* Expressive Rank Cross Tabulation**

			Expressive Rank			Total
			1 <sup>st</sup>	2nd	3rd	
Structure Rank	1st	Count	451	967	1040	2458
		% within Structure Rank	18.3%	39.3%	42.3%	100.0%
	2nd	Count	1712	2392	1055	5159
		% within Structure Rank	33.2%	46.4%	20.4%	100.0%
	3rd	Count	1965	1504	492	3961
		% within Structure Rank	49.6%	38.0%	12.4%	100.0%
Total		Count	4128	4863	2587	11578
		% within Structure Rank	35.7%	42.0%	22.3%	100.0%

**Table 9**  
**Structure Rank \* Assertive Rank Cross Tabulation**

			Assertiveness Rank			Total
			1 <sup>st</sup>	2nd	3rd	
Structure Rank	1st	Count	451	908	1099	2458
		% within Structure Rank	18.3%	36.9%	44.7%	100.0%
	2nd	Count	1544	2369	1246	5159
		% within Structure Rank	29.9%	45.9%	24.2%	100.0%
	3rd	Count	1809	1582	570	3961
		% within Structure Rank	45.7%	39.9%	14.4%	100.0%
Total		Count	3804	4859	2915	11578
		% within Structure Rank	32.9%	42.0%	25.2%	100.0%

**Table 10**  
**Structure Rank \* Flexible Rank Cross Tabulation**

			Flexible Rank			Total
			1 <sup>st</sup>	2nd	3rd	
Structure Rank	1st	Count	647	1048	763	2458
		% within Structure Rank	26.3%	42.6%	31.0%	100.0%
	2nd	Count	1648	2304	1207	5159
		% within Structure Rank	31.9%	44.7%	23.4%	100.0%
	3rd	Count	1402	1640	919	3961
		% within Structure Rank	35.4%	41.4%	23.2%	100.0%
Total	Count	3697	4992	2889	11578	
	% within Structure Rank	31.9%	43.1%	25.0%	100.0%	

**Table 11**  
**Conceptual Rank \* Expressive Rank Cross Tabulation**

			Expressive Rank			Total
			1st	2nd	3rd	
Conceptual Rank	1st	Count	2060	1108	250	3418
		% within Conceptual Rank	60.3%	32.4%	7.3%	100.0%
	2nd	Count	1629	2576	1085	5290
		% within Conceptual Rank	30.8%	48.7%	20.5%	100.0%
	3rd	Count	439	1179	1252	2870
		% within Conceptual Rank	15.3%	41.1%	43.6%	100.0%
Total	Count	4128	4863	2587	11578	
	% within Conceptual Rank	35.7%	42.0%	22.3%	100.0%	

**Table 12**  
**Conceptual Rank \* Assertive Rank Cross Tabulation**

		Assertiveness Rank			Total
		1st	2nd	3rd	
Conceptual 1st Rank	Count	1918	1150	350	3418
	% within Conceptual Rank	56.1%	33.6%	10.2%	100.0%
2nd	Count	1478	2543	1269	5290
	% within Conceptual Rank	27.9%	48.1%	24.0%	100.0%
3rd	Count	408	1166	1296	2870
	% within Conceptual Rank	14.2%	40.6%	45.2%	100.0%
Total	Count	3804	4859	2915	11578
	% within Conceptual Rank	32.9%	42.0%	25.2%	100.0%

**Table 13**  
**Conceptual Rank \* Flexible Rank Cross Tabulation**

		Flexible Rank			Total
		1st	2nd	3rd	
Conceptual 1st Rank	Count	1817	1300	301	3418
	% within Conceptual Rank	53.2%	38.0%	8.8%	100.0%
2nd	Count	1434	2557	1299	5290
	% within Conceptual Rank	27.1%	48.3%	24.6%	100.0%
3rd	Count	446	1135	1289	2870
	% within Conceptual Rank	15.5%	39.5%	44.9%	100.0%
Total	Count	3697	4992	2889	11578
	% within Conceptual Rank	31.9%	43.1%	25.0%	100.0%

**Table 14**  
**Significant Correlations between EP Analytical Factor and NEO-FFI Sub-Factors**

E1	-.228	(opposite of ) warmth, affectionate, friendly, close attachments
E3	.207	dominant, forceful, social climbing
C1	.233	competence, capable, sensible, prudent effective
C3	.175	dutiful, ethical, conscientious, moral obligations
C4	.274	achievement, aspiration, diligent, driven

(N=98, p<.01)

**Table 15**  
**Significant Correlations between EP Structural Factor and NEO-FFI Sub-Factors**

N1	.307	general anxiety, phobias, tense, jittery
N4	.293	self-consciousness, sensitivity, inferiority, uncomfortable
E1	-.206	(opposite of ) warmth, affectionate, friendly, close attachments
E2	-.243	(opposite of ) gregarious, other company
E3	-.350	(opposite of ) dominant, forceful, social climbing
E4	-.221	(opposite of ) energy, active, fast moving, thrill seeker
O1	-.362	(opposite of ) fantasy, imaginative, daydreamer, creative
O2	-.340	(opposite of ) aesthetic, art, beauty, music, poetry
O3	-.303	(opposite of ) inner feelings, emotive, emotional depth and intensity
O4	-.508	(opposite of ) willingness, try new things, novelty, variety
A1	-.273	(opposite of ) trust, honest, well-intentioned
A2	.171	straightforwardness, frank, sincere, ingenuous
C2	.543	order, tidy, well organized, planful

(N=98, p<.01)

**Table 16**  
**Significant Correlations between EP Conceptual Factor and NEO-FFI Sub-Factors**

N1	-.184	(opposite of ) general anxiety, phobias, tense, jittery
N4	-.199	(opposite of ) self-consciousness, sensitivity, inferiority, uncomfortable
E1	.524	warmth, affectionate, friendly, close attachments
E3	.316	dominant, forceful, social climbing
E4	.264	energy, active, fast moving, thrill seeker
O1	.519	fantasy, imaginative, daydreamer, creative
O2	.348	aesthetic, art, beauty, music, poetry
O3	.342	inner feelings, emotive, emotional depth and intensity
O4	.381	willingness, try new things, novelty, variety
A1	.228	trust, honest, well-intentioned
C2	-.516	(opposite of ) order, tidy, well organized, planful

(N=98, p<.01)

**Table 17**  
**Significant Correlations between EP Social Factor and NEO-FFI Sub-Factors**

E1	.592	warmth, affectionate, friendly, close attachments
E2	.412	gregarious, other company
E3	.235	dominant, forceful, social climbing
E4	.264	energy, active, fast moving, thrill seeker
O1	.300	fantasy, imaginative, daydreamer, creative
O2	.364	aesthetic, art, beauty, music, poetry
O3	.553	inner feelings, emotive, emotional depth and intensity
A2	-.186	(opposite of ) straightforwardness, frank, sincere, ingenuous
A3	.240	altruistic, concern for others, generous, helpful

(N=98, p<.01)

**Table 18**  
**Significant Correlations between EP Expressive Factor and NEO-FFI Sub-Factors**

E1	.524	warmth, affectionate, friendly, close attachments
E3	.207	dominant, forceful, social climbing
C1	.233	competence, capable, sensible, prudent effective
C3	.175	dutiful, ethical, conscientious, moral obligations
C4	.274	achievement, aspiration, diligent, driven

(N=98, p<.01)

**Table 19**  
**Significant Correlations between EP Assertiveness Factor and NEO-FFI Sub-Factors**

N2	.226	hostility, bitterness, anger, frustration
N4	-.235	(opposite of ) self-consciousness, sensitivity, inferiority, uncomfortable
E1	.174	warmth, affectionate, friendly, close attachments
E2	.289	gregarious, other company
E3	.706	dominant, forceful, social climbing
E4	.482	energy, active, fast moving, thrill seeker
O3	.385	inner feelings, emotive, emotional depth and intensity
A2	-.316	(opposite of ) straightforwardness, frank, sincere, ingenuous
A3	-.201	(opposite of ) altruistic, concern for others, generous, helpful
A4	-.576	(opposite of ) compliance, withdrawn, forgive, deference
C4	.363	achievement, aspiration, diligent, driven

(N=98, p<.01)

**Table 20**  
**Significant Correlations between EP Flexible Factor and NEO-FFI Sub-Factors**

E1	.622	warmth, affectionate, friendly, close attachments
E2	.403	gregarious, other company
E3	.210	dominant, forceful, social climbing
E4	.179	energy, active, fast moving, thrill seeker
O1	.250	fantasy, imaginative, daydreamer, creative
O2	.429	aesthetic, art, beauty, music, poetry
O3	.443	inner feelings, emotive, emotional depth and intensity
O4	.248	willingness, try new things, novelty, variety
A1	.217	trust, honest, well-intentioned
A3	.314	altruistic, concern for others, generous, helpful
C1	.212	competence, capable, sensible, prudent effective

(N=98, p<.01)

**Table 21**  
**EP and NEO-FFI Main Factors**

		Analytical	Structural	Social	Conceptual	Expressive	Assertive	Flexible
N	Corr.	0.003	.218(*)	0.088	-0.118	0.006	-0.049	-0.137
	Sig	0.490	0.016	0.195	0.126	0.477	0.316	0.091
E	Corr.	-0.032	-.342(**)	.486(**)	.269(**)	.731(**)	.554(**)	.457(**)
	Sig	0.377	0.000	0.000	0.004	0.000	0.000	0.000
O	Corr.	-0.077	-.517(**)	.459(**)	.547(**)	.446(**)	.223(*)	.471(**)
	Sig	0.228	0.000	0.000	0.000	0.000	0.014	0.000
A	Corr.	-0.105	0.029	0.028	-0.027	-.195(*)	-.365(**)	.170(*)
	Sig	0.154	0.388	0.394	0.395	0.028	0.000	0.048
C	Corr.	.271(**)	.201(*)	.178(*)	-0.167	.225(*)	.203(*)	.192(*)
	Sig	0.004	0.024	0.041	0.052	0.013	0.023	0.030

(N=98, p<=.01)

**Table 22**  
**EP Factors and NEO-FFI Neuroticism Sub-Factor**

		Analytical	Analytical	Structural	Social	Conceptual	Expressive	Assertive
N1	Corr.	0.136	.307(**)	0.129	-.184(*)	0.022	-0.086	-0.085
	Sig	0.092	0.001	0.104	0.035	0.415	0.201	0.204
N2	Corr.	-0.063	0.006	0.167	0.055	.251(**)	.266(**)	-0.059
	Sig	0.270	0.476	0.051	0.295	0.007	0.004	0.283
N3	Corr.	0.004	0.091	-0.010	-0.046	-0.069	-0.101	-0.148
	Sig	0.485	0.189	0.462	0.327	0.250	0.163	0.074
N4	Corr.	-0.087	.293(**)	-0.007	-.199(*)	-.189(*)	-.235(*)	-0.153
	Sig	0.198	0.002	0.472	0.025	0.032	0.010	0.067

(N=98, p<.01)

**Table 23**  
**EP Factors and NEO-FFI Expressiveness Sub-Factor**

		Analytical	Structural	Social	Conceptual	Expressive	Assertive	Flexible
E1	Corr.	-.228(*)	-.206(*)	.592(**)	.202(*)	.524(**)	.174(*)	.622(**)
	Sig	0.012	0.022	0.000	0.024	0.000	0.044	0.000
E2	Corr.	-0.146	-.243(**)	.412(**)	0.116	.511(**)	.289(**)	.403(**)
	Sig	0.076	0.008	0.000	0.129	0.000	0.002	0.000
E3	Corr.	.207(*)	-.350(**)	.235(*)	.316(**)	.650(**)	.706(**)	.210(*)
	Sig	0.021	0.000	0.010	0.001	0.000	0.000	0.020
E4	Corr.	0.051	-.221(*)	.264(**)	.192(*)	.526(**)	.482(**)	.179(*)
	Sig	0.311	0.015	0.005	0.030	0.000	0.000	0.039

(N=98, p<.01)



**Table 24**  
**EP Factors and NEO-FFI Openness Sub-Factor**

		Analytical	Structural	Social	Conceptual	Expressive	Assertive	Flexible
O1	Corr.	-0.118	-.362(**)	.300(**)	.519(**)	.251(**)	0.127	.250(**)
	Sig	0.126	0.000	0.001	0.000	0.007	0.108	0.007
O2	Corr.	-0.051	-.340(**)	.364(**)	.348(**)	.256(**)	0.039	.429(**)
	Sig	0.310	0.000	0.000	0.000	0.006	0.351	0.000
O3	Corr.	-0.023	-.303(**)	.553(**)	.342(**)	.637(**)	.385(**)	.443(**)
	Sig	0.411	0.001	0.000	0.000	0.000	0.000	0.000
O4	Corr.	-0.023	-.508(**)	0.132	.381(**)	.204(*)	0.148	.248(**)
	Sig	0.410	0.000	0.099	0.000	0.022	0.074	0.007

(N=98, p<.01)

**Table 25**  
**EP Factors and NEO-FFI Agreeableness Sub-Factor**

		Analytical	Structural	Social	Conceptual	Expressive	Assertive	Flexible
A1	Corr	-0.128	-.273(**)	0.148	.228(*)	.178(*)	0.036	.217(*)
	Sig.	0.106	0.003	0.074	0.012	0.041	0.362	0.016
A2	Corr	0.062	.171(*)	-.186(*)	-0.148	-.322(**)	-.316(**)	-0.022
	Sig.	0.274	0.047	0.034	0.075	0.001	0.001	0.414
A3	Corr	-0.082	0.077	.240(**)	-0.009	-0.013	-.201(*)	.314(**)
	Sig.	0.213	0.228	0.009	0.466	0.451	0.024	0.001
A4	Corr	-0.158	0.132	-0.047	-0.148	-.376(**)	-.576(**)	0.063
	Sig.	0.060	0.099	0.323	0.073	0.000	0.000	0.271

(N=98, p<.01)

**Table 26**  
**EP Factors and NEO-FFI Conscientiousness Sub Factor**  
(n=98)

		Analytical	Structural	Social	Conceptual	Expressive	Assertive	Flexible
C1	Corr.	.233(*)	0.015	.188(*)	0.060	.169(*)	0.155	.212(*)
	Sig	0.011	0.441	0.033	0.280	0.049	0.065	0.019
C2	Corr.	0.116	.543(**)	0.045	-.516(**)	0.027	-0.043	0.049
	Sig	0.130	0.000	0.332	0.000	0.396	0.337	0.318
C3	Corr.	.175(*)	0.017	0.051	-0.003	0.072	0.153	0.166
	Sig	0.043	0.435	0.310	0.487	0.243	0.067	0.052
C4	Corr.	.274(**)	-0.137	.246(**)	0.128	.397(**)	.363(**)	0.158
	Sig	0.003	0.090	0.008	0.105	0.000	0.000	0.061

(N=98, p<.01)

**Table 27**  
**Table of Means and Standard Deviations**  
(N=308)

		Mean	Std. Deviation
Analysis	First	51	25
	Second	50	26
Structural	First	40	24
	Second	38	27
Social	First	46	24
	Second	48	26
Conceptual	First	54	25
	Second	61	26
Expressiveness	First	53	24
	Second	53	25
Assertive	First	58	23
	Second	56	24
Flexibility	First	46	24
	Second	47	25

**Table 28**  
**Bivariate Correlations**

	Analysis #2	Structure #2	Social #2	Conceptual #2	Expressive #2	Assertive #2	Flexible #2
Analysis #1	.76						
Structural #1		.75					
Social #1			.74				
Conceptual #1				.76			
Expressiveness#1					.77		
Assertive #1						.68	
Flexibility #1							.71

(N=308, p<.01)

**Table 29**  
**Test-Retest**  
**Independent Samples t-Test**

		Levene's Test for Equality of Variances		t-Test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Analytical	Equal variances assumed	.839	.360	.722	614	.470	1.513	2.094	-2.600	5.626
	Equal variances not assumed			.722	613.013	.470	1.513	2.094	-2.600	5.626
Structural	Equal variances assumed	4.081	.044	1.126	614	.261	2.373	2.108	-1.767	6.513
	Equal variances not assumed			1.126	608.886	.261	2.373	2.108	-1.767	6.513
Social	Equal variances assumed	2.250	.134	-.984	614	.325	-1.990	2.022	-5.961	1.981
	Equal variances not assumed			-.984	610.318	.325	-1.990	2.022	-5.961	1.981
Conceptual	Equal variances assumed	.570	.450	-3.549	614	.000	-7.484	2.109	-11.625	-3.343
	Equal variances not assumed			-3.549	613.115	.000	-7.484	2.109	-11.625	-3.343
Expressiveness	Equal variances assumed	.012	.914	.285	614	.776	.578	2.028	-3.404	4.560
	Equal variances not assumed			.285	613.385	.776	.578	2.028	-3.404	4.560
Assertive	Equal variances assumed	.139	.710	.909	614	.364	1.750	1.924	-2.029	5.529
	Equal variances not assumed			.909	613.912	.364	1.750	1.924	-2.029	5.529
Flexible	Equal variances assumed	1.396	.238	-.354	614	.723	-.714	2.018	-4.676	3.248
	Equal variances not assumed			-.354	612.126	.723	-.714	2.018	-4.676	3.248

(N=98, p<.01)

**Table 30**  
**Percentile Means by Subjects Reporting Age**

Age		Conceptual	Analytical	Structural	Social	Expressive	Assertive	Flexible
	N Valid	19541	19541	19541	19541	19541	19541	19541
	Mean	50	52	50	50	50	51	51
	Std. Deviation	28	29	28	28	29	29	28
21 - 30	N Valid	1485	1485	1485	1485	1485	1485	1485
	Mean	47	50	51	49	49	46	44
	Std. Deviation	26	29	26	27	27	27	28
31 - 40	N Valid	2512	2512	2512	2512	2512	2512	2512
	Mean	49	51	50	48	49	49	45
	Std. Deviation	26	28	26	26	28	27	27
41 - 50	N Valid	2034	2034	2034	2034	2034	2034	2034
	Mean	50	51	49	47	48	47	47
	Std. Deviation	26	28	27	26	27	27	27
51 - 60	N Valid	927	927	927	927	927	927	927
	Mean	49	50	52	48	46	43	48
	Std. Deviation	26	27	26	26	28	27	27
61 - 70	N Valid	185	185	185	185	185	185	185
	Mean	45	50	55	46	46	42	45
	Std. Deviation	27	28	26	25	27	27	27
71 - Up	N Valid	12	12	12	12	12	12	12
	Mean	48	57	44	40	44	42	38
	Std. Deviation	25	30	29	31	24	19	31
Under 21	N Valid	120	120	120	120	120	120	120
	Mean	48	42	57	57	50	45	46
	Std. Deviation	27	27	27	27	30	28	30

**Table 31**  
Percentile Means by Subjects Reporting Gender

Gender		N	Mean	Std. Deviation
Female	Analytical	48125	46	11
	Social	48125	60	9
	Structure	48125	37	8
	Conceptual	48125	52	9
	Expressive	48125	56	10
	Assertive	48125	57	11
	Flexibility	48125	60	10
Male	Analytical	40976	52	11
	Social	40976	58	9
	Structure	40976	34	8
	Conceptual	40976	54	9
	Expressive	40976	55	10
	Assertive	40976	60	11
	Flexibility	40976	58	10

**Table 32**  
Percentile Means by Subjects Reporting Ethnicity

	African American	Asian	Caucasian	Hispanic	Other
Subjects	416	2564	6083	767	379
Analysis	55	53	53	61	54
Social	49	47	46	50	45
Structural	54	57	51	58	53
Conceptual	47	47	47	47	46
Flexibility	52	43	46	54	46
Assertive	48	41	48	52	46
Expressiveness	47	41	46	51	44

**Table 33**  
**Percentile Means by Subjects Reporting Education**

Education		Conceptual	Analytical	Structural	Social	Expressive	Assertive	Flexible
Advanced College	N Valid	2345	2345	2345	2345	2345	2345	2345
	Mean	54	59	48	49	51	52	48
	Std. Deviation	25	26	26	26	27	26	26
College Grad	N Valid	2870	2870	2870	2870	2870	2870	2870
	Mean	49	50	50	48	48	47	45
	Std. Deviation	26	28	26	26	27	27	27
HS Diploma	N Valid	670	670	670	670	670	670	670
	Mean	45	36	52	46	46	40	42
	Std. Deviation	26	27	27	28	29	27	29
Some College	N Valid	768	768	768	768	768	768	768
	Mean	47	49	55	49	47	46	50
	Std. Deviation	25	27	26	25	26	26	27
Some HS	N Valid	156	156	156	156	156	156	156
	Mean	43	41	59	46	46	42	44
	Std. Deviation	28	27	26	29	29	29	30
Vo-Tech	N Valid	371	371	371	371	371	371	371
	Mean	42	38	54	43	43	35	39
	Std. Deviation	28	29	29	28	28	27	28

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