Berke Assessment
Technical Manual

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1. Introduction

The Berke Assessment and Profile (Berke) is an assessment tool designed to help employers understand the personality, behavioral and talent characteristics of candidates applying for job positions in their corporations. It measures personality, cognitive and behavioral characteristics through self-report questions and measures talent characteristics by means of work samples – structured samples of problem-solving and other behavior.

At Berke, we take the matters of validity, reliability, and legal defensibility seriously. Our success and our customers' success depend on these foundational elements of the Berke system.

When we created the Berke Assessment, we enlisted experts in the fields of law, HR, and psychology to review the entire instrument. The team eliminated any words or questions that were "loaded" either negatively or positively in terms of race, age, gender or ethnic background. We also conducted a number of studies in order to check for systematic bias. In these studies, we compared the distribution of scores on the subtests of the Berke Assessment by race, gender, age and ethnic background. The differences in the midpoints of these distributions were small and statistically and practically insignificant.

The Berke Science and Research team also conducts constant research to assure the validity and reliability of the instrument. In broad terms, there are two types of research.

In the first type of research, we aggregate data derived from all people who have taken the Berke in a given timeframe. This is considered basic, or background research and is done to provide normative estimates and estimates of reliability. We routinely conduct updates of this type of research in order to assure the ongoing viability of the instrument. Current normative data is based on approximately 220,000 cases.

We use well-accepted psychometrics for testing for the reliability of the instruments, including item-alpha studies, split-half studies, and, where appropriate, alternative forms studies.

The second type of research concerns the validity of Berke's scales. Our most typical study is undertaken to establish the predictive qualities of Berke's scales for specific jobs at specific companies. In studies like this, participants take the Berke Assessment and their managers rate their overall performance. These studies provide statistical information about the relationship between the Berke scores and success at particular positions in the specific company using the Berke.

We constantly conduct these job specific studies for customers across a wide variety of industries. These job studies have been completed on positions ranging from top executive positions in companies with $1B or more in revenue to entry-level positions at small companies with less than 50 employees. We have done numerous studies of C-level positions, middle management positions, support positions and entry-level hourly positions. The goal of these studies is to set predictive ranges and weights for each of the Berke scales for the unique position in a particular company.

Finally, it is important to understand the unique characteristics of Berke's job matching process. When a customer needs to fill a job, they go through a process whereby a customized job profile is created. A job profile describes the personality traits and cognitive abilities that are required to succeed in a specific job at the customer's company. After candidates complete the assessment, they are compared to the customer's customized job profile, and Berke shows clearly how they match up. No specific skill or professional knowledge is needed to read and understand a Berke Profile. The answers a manager wants are clear and easily understandable. For managers that want more information, more is available in the report and interview guide.

Candidates are not compared to "off the shelf" benchmarks which may not be relevant to the customer's job opening. Candidates are compared to the unique customer specific requirements of the job and company to which they are applying.

We are committed to ensuring the continued validity, reliability, and legal defensibility of the Berke system. If you have any questions regarding the psychometric qualities of the Berke Assessment, please contact your account representative for additional information.

2. Scale Definitions and Development History

The Berke Assessment currently generates seven personality scales, four cognitive scales, and one skill scale.

Personality Scales

Personality Scales test for the relatively enduring personal traits usually referred to as personality. Personality traits are not permanent in a given individual; however, they tend to endure over a period of years, changing, if at all, only slowly. When they do change, these changes are usually gradual and a matter of degree, not of completely changed characteristics (Roberts & Mrozek, 2008). For this reason, they are usually predictive of workplace behavior and are often associated with significant differences between individuals in performance in a given role (Ozer & Binet-Martinez, 2006). Not all personality scales are equally predictive. Specific scale predictiveness depends heavily on the particular company and the type of role for which the person is being tested.

The personality scales of the Berke Assessment are based on a self-report adjective checklist with a forced-choice Likert scale. This builds on the work of a number of people in the field of personality research based on an adjective checklist (Digman, 1990; McCrae & Costa, 1987; McCrae & John, 1992; Poropat, 2009; Soucier & Goldberg, 1996).

The specific forerunner of the Berke Assessment is the AVA (Activity Vector Analysis), a test utilizing a four-factor model of personality which was developed by Walter Clark in the 1940's, based on the work of Prescott Lecky, William Marston and others (Locke, 1962).

Assertiveness

Assertiveness is a natural tendency to take the initiative in order to control or influence a situation.

- **High:** Individuals high in Assertiveness are typically determined and direct. They are willing to move forward, take action, and solve problems. At extremes, they may be confrontational or stubborn.

- **Low:** Individuals low in Assertiveness seek to achieve goals through cooperation and good planning. They are slower to move into action and tend to stop and reassess when faced with obstacles. They are often receptive to the influence and actions of others.

See: (Alberti, 2001; Goleman, 1996)

Assertiveness at high levels is usually a prominent factor in leadership and sales positions in which it is important to influence the behavior of other people directly. At mid-levels, Assertiveness is important in many positions in organizational structure. In general, it is characteristic of middle management, or mid-level sales, in which the person must assert influence over others, but is not actually in charge of defining or directing his or her efforts. At lower levels, Assertiveness is prominent in positions in which a person's behavior is prescribed, and he or she must take a great deal of direction from others. This is common in many support roles, labor and manufacturing roles, customer service roles and call center roles.

Sociability

Sociability is a natural tendency to gain satisfaction from interacting with other people.

- **High:** Individuals high in Sociability are driven to interact with others. They prefer not to work alone for extended periods of time and actively seek new relationships.
- **Low:** Individuals low in Sociability enjoy working alone. They can interact with others, but must work at it, and may find long periods of interaction stressful. They prefer fewer social contacts and are less likely to seek new relationships.

See: (Cain, 2012; Thompson, 2008)

High Sociability generally means that the person actively seeks out connections between himself or herself and others. High Sociability is often associated with high-level sales positions and positions in which the person must constantly interact with others. In these kinds of complex interactions, the ability to form close personal relationships easily is a decided advantage. Mid-level of Sociability is associated with a variety of positions in which the person wants to have influence over others, but also must follow a protocol or pattern of interaction. This is common in mid-level positions in the organizational structure, where the ability to form relationships is a positive help to a person's career. Lower level Sociability is sometimes associated with positions of leadership and influence. In these cases, the ability to work alone for long periods may be of some benefit. At the other end of the continuum, low Sociability is also associated with positions in which much of the interaction is prescribed and scripted, as in customer service positions.

Responsiveness

Responsiveness is a natural tendency to express opinions and feelings openly and spontaneously.

- **High:** Individuals high in Responsiveness are always ready to express their feelings and opinions. They do not leave others in doubt as to what they want or what they think. Generally, they prefer a fast-paced work environment and often like many things happening at once.
- **Low:** Individuals low in Responsiveness are steady, calm, and rational. They often tend to keep their feelings and opinions internalized and may like to work at a slower, composed pace so that they can think about what they want to do or say.

See: (Carducci, 2009; Carver & White, 2009; Mathews & Deary, 2008)

High levels of Responsiveness are characteristic of success in any role in which it is important that the other person hear and understand one's directives (leadership), sales proposition (sales, marketing, business development), and ideas (teaching, sales presentations). Positions that require mid-levels of Responsiveness are ones in which it is important to be careful and somewhat selective about sharing one's ideas. In an outbound call center sales position, for instance, the person must listen well, but also at times interrupt the customer to make a sales pitch. A sales coach must listen well, but also be directive at times to the person he/she is coaching. As listening to the other and problem-solving become more prominent in positions, lower levels of Responsiveness are associated with more success. Positions in which it is very important to pay attention to the other often include inbound call center positions, administrative assistants or listening professions like HR or counseling. Problem-solving positions that typically show low Responsiveness can include technology, consulting and financial.

Structure

Structure is a natural tendency to seek order, certainty, and correctness.

- **High:** Individuals high in Structure prefer order and certainty. They tend to follow rules and established procedures and are uncomfortable with uncertainty and ambiguity. They may also be accurate and thorough.
- **Low:** Individuals low in Structure have a greater tolerance for ambiguity. They tend to be more concerned with outcomes than following rules and established procedures.

See: (Holland, 1973; Roberts et al., 2009)

High levels of Structure are prominent in most roles in which it is important that the person be right and correct. People who are high in Structure are typically very conscientious about details. They tend to like roles in which the rules and expectations are clear. High Structure is associated with many service roles (call center, administrative, nurse aide). It is also associated with roles in which a mistake can be very costly (finance, operations, technology, medical). Mid-levels of Structure are connected with roles in which rules and protocol are important, but some flexibility or dealing with ambiguity is helpful as well. Examples of these mid-Structure roles are middle management positions, sales roles in which there are many steps that must be followed, or operations leadership positions. Low levels of Structure are associated with roles in which an outcome is desired, but the specific path to the outcome is not necessarily defined or clear (many sales roles, executive leadership, consulting). It is also associated with artistic and creative roles for the same reason.

Social Adaptability

Social Adaptability is a natural tendency to be aware of other people's feelings in order to produce the most positive interactions.

- **High:** Individuals high in Social Adaptability are very concerned about other people's thoughts and feelings when deciding what to do or say. They tend to be diplomatic and tactful and want to be on positive terms with most people.
- **Low:** Individuals low in Social Adaptability are independent-minded and are less concerned about the impact of their behavior on others. They do not readily take other people's thoughts and feelings into account when making a decision or expressing a thought or feeling.

See: (Paounonen & Jackson, 2009; Wiggens, 2007)

High levels of Social Adaptiveness are prominently associated with positions that are service oriented or any position in which it is important to hear the other person's ideas and feelings and respond to them. It is frequently seen in administrative roles, call center roles, customer service roles, nursing and medical aide roles, HR roles, as well as teaching and counseling roles.
Mid-levels of Social Adaptiveness are frequently seen in sales roles. Here it important to hear and understand the feelings of the customer, but also important not to give too much away in negotiating a deal. Low levels of Social Adaptiveness are often prominent in leadership, finance, science, consulting, and technology. These are often problem-solving roles in which the person must come up with unique solutions and get other people to buy them.

Optimism

Optimism is a natural tendency to think positively about the future, without regard to external circumstances.

- **High:** Individuals high in Optimism tend to feel cheerful and upbeat most of the time and may ignore negative information.
- **Low:** Individuals low in Optimism tend to look more actively for potential problems and worry about what could go wrong.

See: (Butchvarov, 1998; LeMorvan, 2011; Seligman & Csikszentmihalyi, 2000)

Optimism at higher ranges is prominent in most roles in which the person must interact positively with other people as part of the job. People who are high in Optimism tend to take other people and situations at face value. Many sales roles, either face to face or on the phone, benefit from some level of Optimism. People who meet the public often and must deal with a large number of strangers positively are able to do this more easily with mid- to high levels of Optimism. Mid-levels of Optimism are helpful in service type roles in which it is important that the person be the "face" of the company to the public. Examples of such roles are Administrative Assistant or Receptionist. On the other hand, in many jobs, it is important not to take people or situations at face value, but rather to approach most interactions with at least some skepticism. Executive positions, science, technology, research, finance, consulting and most problem-solving positions typically pull low Optimism.

Emotional Intensity

Emotional Intensity is a natural tendency to react strongly, immediately and intensely, especially when events do not unfold as planned.

- **High:** When frustrated in plans, individuals high in Emotional Intensity tend to respond with a strong level of energy and vigor.
- **Low:** Individuals low in Emotional Intensity tend to keep anger and frustration to themselves when frustrated.

See: (Maddi, 2006)

Cognitive Scales

Cognitive Scales test for various learning and problem-solving characteristics of the person. The cognitive scales are fundamentally different from the personality scales in that they are not self-report. Rather, cognitive abilities are assessed via work samples – problems and puzzles that load heavily on the particular ability or talent being studied. This has proven to be the only effective way to test for these kinds of capabilities. Problem-solving and learning abilities are often invisible to the person. This makes self-report of these factors highly unreliable. However, presenting problems that load on each of the problem-solving behaviors has proven both reliable and predictive in many jobs and settings.

All four of the problem-solving scales have a common factor of g – or general intelligence. General intelligence helps the person learn from the environment, think about solutions, cope with change and the unexpected, solve problems and think ahead. These are the types of things that the cognitive scales are measuring in specific ways. Whereas g is a general factor, the cognitive scales measure specific aspects of g.

Problem Solving Style

Problem-Solving Style refers to the combination of talents used to solve problems. There are two specific capabilities that drive one's approach to problem-solving: Logical Problem Solving and Rapid Problem Solving. Rapid Problem Solving is quick, as the name implies, and is holistic in approach, meaning that it will pull information from many sources to solve a problem; however, it cannot deal well with problems of strategy or problems of more than a modicum of complexity. The more personal experience the person has in the field of the problem, the more complexity the person can deal with utilizing this problem-solving style. Logical Problem Solving, on the other hand, is slower but is able to deal with a great deal of complexity. This style is linear. The person using it will want to go from known quantities step by step to a solution. This style of solving problems is sometimes felt to be more effortful, but the main effort appears to be in shifting over from a rapid problem-solving style, which is felt to be natural and easy to a logical one, which requires more time and concentration.

See: (Kahneman, 2011)

Logical Problem Solving

Logical Problem Solving refers to the ability to think through large, complicated problems in a linear, step-by-step way.

- **High:** Individuals high in Logical Problem Solving utilize a methodical, process-oriented approach to solving problems. This talent helps them with strategic thinking and the organization of ideas and enables them to communicate solutions to others easily.
- **Low:** Individuals low in Logical Problem Solving tend to find it difficult to solve large, complicated problems.

Rapid Problem Solving

Rapid Problem Solving refers to the ability to deal quickly with many problems, one after another.

- **High:** Individuals high in Rapid Problem Solving tend to "just know" the answers, but not necessarily how to explain them to others. This talent helps with quick, seat-of-the-pants problem-solving situations.
- **Low:** Individuals low in Rapid Problem Solving find it stressful to work in an environment filled with problems.

Individuals low in Logical and Rapid Problem Solving ability tend to rely more on experience than natural talent to solve problems. With solid experience, it is possible to develop quick, practical solutions to problems, particularly in one's area of knowledge and expertise – or one related to it.

Virtually every job requires some kind of problem-solving. As a rule, higher level jobs and jobs that involve making decisions load more heavily on Logical Problem Solving. Any job in which the person must take a number of factors into account in making a decision or deciding on a course of action – including what the impact of the decision may be in the future – will be aided by strong Logical Problem Solving. Any problem-solving role, such as science, research, consulting, tech support, engineering, administrative, counseling, medical, IT, HR, legal or financial will heavily use Logical Problem Solving. In addition, most leadership roles strongly utilize this talent: operations, construction, management, executive, leader or decision maker. In many large or complex sales environments, Logical Problem Solving plays a prominent role. Any time one needs a complex view of the future – when developing plans, strategy, projections and 'what-if' scenarios – one utilizes logic.

People generally experience rapid problem solving as more intuitive and natural. Even in jobs that load heavily on Logical Problem Solving, Rapid Problem Solving can be helpful. Solving big and complex problems is seldom 100% of a job. Many problems are smaller and less important. If these can be disposed of quickly and efficiently, it leaves more mental time and energy for the

more complex problems. Some jobs – mostly lower level jobs – load heavily on Rapid Problem Solving. These are jobs in which the person is making more immediate decisions and decisions that do not affect other people as much.

Measures of Intelligence

Berke uses two measures related to two different aspects of intelligence – Verbal and Spatial. Verbal Intelligence is what we generally think of when we think about intelligence. It is the ability to learn from one's environment, especially one's social environment. The best correlate of verbal intelligence is vocabulary – which is a straightforward measure of how much the person has learned from the culture in which he or she grew up. Spatial Intelligence is prominent in scientific, technical and engineering fields. However, it is also of great help whenever the person must deal with complex, changing and multifaceted problems. Spatial intelligence is measured by testing the person's ability to solve three-dimensional puzzles.

Spatial Visualization

Spatial Visualization refers to a natural ability to hold, manipulate and think about three dimensions in one's mind.

- **Higher:** Individuals higher in spatial visualization can easily picture three or more dimensions in their minds. This means that they deal relatively easily with such spatial problems.
- **Lower:** Individuals lower in spatial visualization generally have a more difficult time picturing three dimensions in their minds and so will utilize more inefficient strategies when working on spatial problems.

Vocabulary

Vocabulary is a measure of the number of words a person has learned and can use as well as the precision with which the person knows and uses them.

- **Higher:** Individuals higher in vocabulary tend to learn quickly and easily from their environments. They deal more easily with new material, new ideas, and new concepts and deal more quickly with change.
- **Lower:** Individuals lower in vocabulary tend to learn more slowly and typically take more time when thinking about and communicating their experiences.

See: (Gardner, 2006; Kaufman & Lichtenberger, 2006; Penrose, 1994; Wechsler, 1939)

Other things being equal, in almost any job, a person with higher intelligence will be more successful than a person with lower intelligence. Intelligence has a broad impact on many types of work and in many situations. People who learn more quickly and easily and who can use their knowledge to solve problems and deal with change have a decided advantage in most work situations – but not all. It is sometimes tempting to treat this as a general rule for hiring – hire the most intelligent person who applies. However, although intelligence is generally and usually important, there are other factors in most jobs that are more important. In some cases, there are several other factors that are quite a bit more important. For instance, you might want a sales agent who is above average in intelligence; however, Assertiveness and Responsiveness are more predictive of success in most face to face sales roles. Verbal intelligence is usually a very prominent factor in leadership, consulting, problem-solving, teaching, HR and almost any executive job. As a general rule, the higher in the organization the job is, the higher level of verbal intelligence is required. There are exceptions, however. Some support roles, problem-solving roles, writing roles or customer service roles, although very low in the organizational structure, require very high levels of verbal intelligence. Here again, personality factors can be as important as intelligence.

People who work with, repair or assemble machines or structures, people who work with tools use Spatial Visualization. These jobs require the workers to solve three-dimensional problems in their minds. Spatial intelligence is helpful in situations in which there are multilayer problems with several constantly changing parameters.

Skill Scale

Cognitive abilities tend to be relatively unchanging through a person's working years. Personality characteristics tend to change a little through a person's working life – but only slowly, and rarely by much. Skills, on the other hand, are learned behaviors. They are acquired throughout a person's life. In contrast to personality characteristics or cognitive abilities, practice will usually improve skills; neglect will usually cause them to deteriorate. One is not born with a skill; one learns a skill. Usually more effort, focus, and practice will improve skills. Skills usually involve a well-defined body of knowledge or type of behavior. One may have natural athletic ability he or she is just born with; one may have an intense and competitive personality; but in order to be a basketball great, he or she has to put in long hours of practice in order to learn the specific skills of basketball.

The Berke Assessment has one skill measurement – the Typing Scale. A great many jobs at all levels of the organization involve the use of the keyboard for entering information. The Typing

Scale is a validated instrument that measures the person's current speed and accuracy of keyboard use.

Typing

A measure of a person's current typing speed and typing accuracy. The average accurate score for adults is 38 words per minute (WPM).

- **Higher:** Individuals with higher scores can type words, numbers and standard punctuation accurately and more quickly than 38 WPM.
- **Lower:** Individuals with lower scores type slower than 38 WPM and/or their accuracy is below average. If a person types quickly but with low accuracy, his or her typing score will be lower.

The purpose of Berke's Typing scale is to assess both a person's typing speed and typing accuracy. After conducting background research on typing speed and concomitant measures of typing accuracy, the following parameters were established that guided development of the Typing scale:

1. It would be short – approximately 2 minutes total.
2. It would simultaneously test for the speed of typing and accuracy of typing.
3. There would be multiple safeguards to prevent cheating on the test.
4. The content would be non-technical.
5. The content would consistently fall into a range of difficulty that would be common in publically read English language documents such as daily newspapers or announcements intended for the general public.
6. The content would include numbers and punctuation.
7. It would be very easy to use and intuitively yield a face-valid result.

The user interface that was developed presents content one word at a time and prevents copying or going backward. The most common way of presenting typing speed is in words per minute (WPM). It was determined that this would imply accurate words per minute. The score represents the number of standard words that the person types accurately within the 60 seconds allotted for the test.

Understanding that a speeded test such as this can lead to some anxiety, detailed instructions and a practice item were developed that allowed the user practice the test under conditions identical to the actual test. The user has the ability to retake the practice items multiple times and to start the test when he or she feels ready.

Accuracy is determined by a straightforward application of the Levenshtein Distance (Levenshtein, 1966).

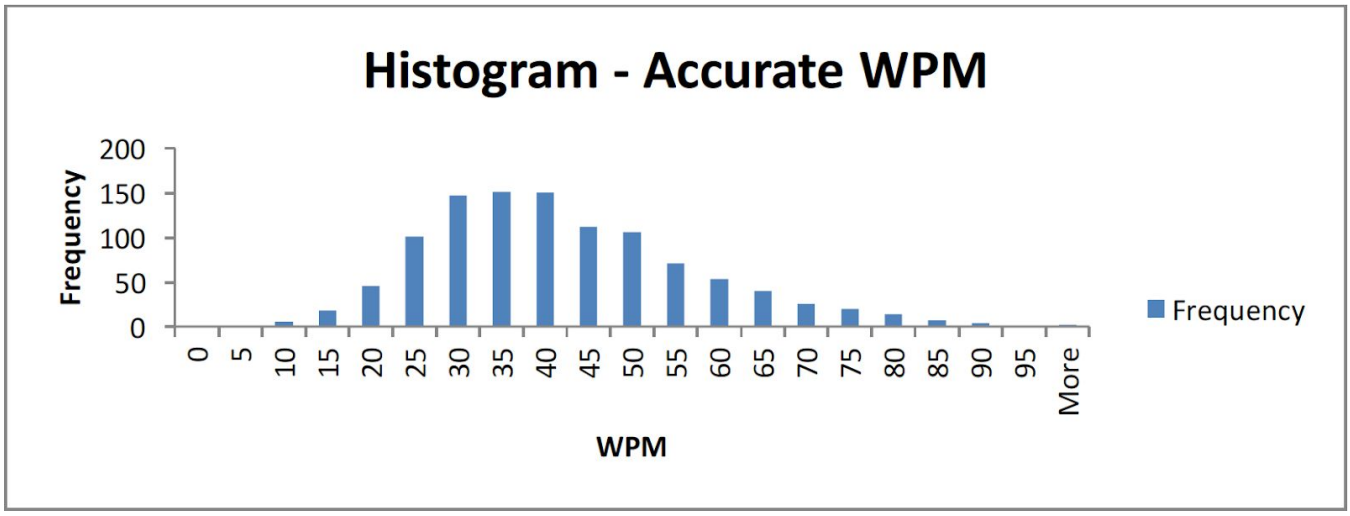
It is important that the content of the test be consistently of the correct difficulty. Multiple versions of the test were created, and each version was subjected to the following tests:

1. Gunning-Fog Index of Readability: Determines the readability of a passage by analyzing the length of words and number of syllables (Gunning, 1952).
2. Flesch Reading Ease: Yields reading difficulty of a sentence in terms of grade level (Flesch, 1948, Kincaid et al., 1975).
3. Grade Level Index: Yields grade level of sentence (Bormuth, 1966; Bormuth, 1969; Bormuth, 1971).
4. Readability Index: Yields a score of reading ease (Dale & Chall, 1948; Dale & Chall, 1949).

All of these measures are highly correlated to one another, but each measures the readability of the sentences to be typed in slightly different ways and yields slightly different scores. The goal was to present sentences in the Typing Test that were above 12th grade level on average, but not as high as graduate school on average. All sentences presented in the Typing test meet these criteria.

The Typing test was created and initially administered 1,951 people. The test was administered both with and without numbers in the content. Since typing speed is a well-understood skill with many different tests in the market, the Typing test results were compared to other published results in the field to establish the validity of the test.

It was also established that the results of the Typing test were well within the .001 confidence limit of published typing speed tests that had a similar approach to content. It was determined that numbers and punctuation were important parts of workplace typing, as was accuracy. When these were taken into account, the overall obtained speed in the Typing Speed test dropped somewhat. Accuracy remained stable.



The above result is exactly in line with other published results of typing speed that used similar content criteria.

The evidence is clear that the user interface of the Typing Speed Test works well and is trouble free. The evidence also shows that the obtained results are valid.

Current Typing Speed norms for the Berke Assessment are based on approximately 100,000 cases.

Integrity Scale

The purpose of the Integrity Scale is to provide interviewers with a clear idea of the candidate's attitude toward theft, truthfulness, and attendance in the workplace. Substantial research in this area using various approaches indicates a demonstrated correlation between attitudes toward truthfulness in the workplace and dishonest behavior. For example, studies (Ajzen, 1988, 1996; Azjen & Fishbein, 1977; Davidson & Jaccard, 1979; and Stroebe, 2000) have shown strong correlations between expressed attitudes and related behavior, provided the questions are posed in a way to be clearly understandable by the candidate.

The following parameters were established during the creation of the Workplace Integrity scale:

1. It would be short – approximately 6 minutes or less.
2. It would be related to workplace behavior.
3. It would be mainly suitable for lower level employees – generally hourly employees.

4. It would be an overt scale, not a covert one. The questions in the scale would be straightforward and easy to understand, and the questions should be asking what the question is supposed to get at.
5. The questions should yield face valid results. That is, a given answer would yield an easily understandable result and be actionable in an interview.

As can be predicted, the scale yields a highly skewed distribution. Most people score in a range that would indicate that their attitude toward truthfulness is in a culturally acceptable range. There is a long tail to the distribution that contains people who score well outside the cultural norms for attitudes toward truthfulness in the workplace. The test flags these people, and the report will contain the actual answers to questions that may be troublesome. In this way, hiring managers can see who is answering questions outside of cultural norms and also see what candidates said about themselves.

The Berke personality and cognitive scales form a validation profile for the Integrity Scale. We would expect that more socially confident people, people who are more socially aware, people who express most concern with others' feelings and attitudes, and people who are most concerned about rules and structure would also express more socially consistent attitudes toward theft and truthfulness. We would expect that people who are more driven and more reactive would be more likely to express impulsive and thoughtless attitudes toward theft and truthfulness.

We would not expect the correlation between attitudes toward truthfulness and cognitive and skill scales to be large.

The following chart shows cross-correlations that are consistent with these predictions.

Scale	Correlation	Significance	Comments
Assertiveness	0.0274	<.01	Associated with interpersonal dominance
Sociability	0.1575	<.001	Interpersonal confidence, awareness
Responsiveness	-0.151	<.001	Reactiveness
Structure	0.0884	<.001	Concerned with rules, structure
Social Adaptability	0.1474	<.001	Concerned with others' feelings
Intensity	-0.2312	<.001	Driven, pushy

Optimism	0.1426	<.001	Wants good feelings
Idea Productivity	0.0441	<.01	Cognitive
Logical Problem Solving	0.0252	<.01	Cognitive
Rapid Problem Solving	0.0586	<.001	Cognitive
Spatial Visualization	0.0765	<.001	Cognitive
Vocabulary	0.0075	NS	Cognitive
Typing	0.0766	<.001	Skill

n=23,800

The correlations with personality scales are significant. They indicate a real connection between the constructs measured by the scales and the construct measured by the Integrity Scale. It should be noted, however, that the correlations are not large enough to be predictive and it is inappropriate to use them in this way.

The strongest correlation between Integrity and Berke personality scales is between Integrity and Intensity. Intensity, when high, can indicate a certain amount of impulsiveness. Likewise, high levels of Responsiveness can indicate a strong reactiveness. These correlations are negative. That is, low levels of Integrity are correlated with high levels of Intensity and Responsiveness. These correlations, though not large enough to be predictive, are nonetheless significant and are in line with predictions.

Sociability, Optimism and Social Adaptability are positively correlated with Intensity. All three of these scales measure different aspects of social awareness, social connection, and social confidence. We would expect people who score high on Integrity to score high on these scales and people who score low on these scales to be more likely to score low on the Integrity scale. This is in fact what we found.

In like manner, there is a mild correlation between Structure, measuring the person's propensity to care about rules and order, and Integrity.

Assertiveness was not as strongly related to Integrity. Assertiveness measures a person's likelihood to wish to dominate and lead interactions. We would not expect there to be a strong relationship with Integrity. Likewise, the cognitive scales were not strongly related to integrity. These outcomes were again in line with predictions.

The personality and cognitive scales of the Berke Assessment correlated to the results of the Integrity assessment in a way that was consistent with predictions and so provide evidence of validation.

Given the nature of the scale and the reporting, measures of internal consistency are not relevant to the overall validity of the scale. Even one item can trigger an alert, for instance, and the vast majority of respondents do not trigger any alert.

3. Psychometric Property Analysis

When analyzing the psychometric properties of any assessment, three different properties of the assessment are of particular importance:

Reliability

Reliability is an estimate of confidence that the score a person makes on a scale is the "true" score of that person and not due to extraneous circumstances. According to the U.S. Department of Labor guide, Testing and Assessment: An Employer's Guide to Good Practices, one should look for reliability coefficients above .7. Reliability coefficients of .8 are better, and coefficients above .9 are excellent.

Scale Independence

With a complex instrument of several different scales, such as the Berke Profile, it is generally desirable that each scale be independent. That is that each measures a trait or factor that is not being measured by the other scales. This means that one should look for low correlations – correlations near 0.0 – between scales.

Validity

Validity is an estimate of confidence that the scale is measuring what it is designed to measure. Validity is never "proven." Rather, scale developers gather more and more evidence that the scale indeed does measure what it is supposed to measure. According to the U.S. Department of Labor's Testing and Assessment: An Employer's Guide to Good Practices, one should expect to see validity coefficients from .11-.2 (barely adequate), to .2 - .35 (likely to be useful), to .35 and above (very beneficial).

Two methods of testing the validity of a scale are assessing the scale's Construct Validity and Criterion Validity:

1. **Construct Validity**
   One method of determining construct validity is finding an alternative way to measure the same personality, behavior or talent characteristic currently measured by a given scale, and then giving both measures to the same person to see if the results correlate positively with each other.

   Another form of construct validity involves looking at groups of people in different job

categories to predict the personality, behavioral and/or talent characteristics one would expect to see for those groups. Data is then run to determine whether those characteristics are what the scale indeed reflects.

Berke conducted several studies early in its development to show construct validity. These are reported below in the section on Validity. We considered these studies necessary in order to show and describe what the Berke scales are measuring and how to describe the result of the Berke. However, we consider this a relatively weak form of validity when attempting to predict an individual candidate's performance in a particular job and a particular company.

2. **Criterion Validity**

   Criterion validity refers to determining whether a particular scale correlates with success or failure for a given criterion – for example, whether salespeople who are higher in Sociability are more successful than those who are low in this characteristic.

   Berke considers criterion validity much more useful in predicting success or failure in a particular job or role than construct validity. For this reason, we have conducted hundreds of studies on different roles and jobs in different companies in order to determine the most predictive target range and weight for each scale for each job. A sample of these studies is shown at the end of this Technical Manual. We urge every customer who uses the Berke to conduct their own studies of their positions. This is clearly the most specific and valid approach to setting job targets for any particular position. There are many circumstances that mitigate against this approach, however. If a company is hiring for a new position, or if it does not have anyone currently in the position who is an outstanding performer, or if managers are questioning their own ability to accurately determine how well incumbents are doing in a job, then it can make sense to use one of a number of pre-researched job profiles we have on file. Typically, these profiles are the result of previous research on other companies with certain positions that recur in company after company.

4. Reliability

For measures such as the scales of the Berke Assessment, one should look for reliability of .700 or above. Reliability above .800 is considered good and above .900 is considered excellent. Several measures and statistics are listed.

Item Alpha: A measure of the internal consistency of the scale. Cronbach's Alpha was used to determine how well the items in a particular scale work together to yield a coherent score. It is a measure of whether the scale is measuring one thing – or several things. Generally, it is preferable for a scale to measure one dimension or factor – not several. Item Alpha is an important measure for estimating the reliability of the scale where appropriate.

Scale Interitem Covariance: Shows an average of the covariance scores in the determination of Cronbach's Alpha.

Average Item Deviation: Shows the average of the deviation from the overall Alpha for successively removing each item from the scale. We would expect a low number here, which means that all items are pulling toward the same result at about the same level.

Split-Half – Odd vs. Even: This is another measure of internal consistency. It shows how well each half of the test correlates with the corresponding other half. The test is split in several different ways. The most useful is odd-even. Positive items vs. Negative items is sometimes used where appropriate. It is not as sensitive as Item Alpha.

Correlation – Odd vs. Total, Even vs. Total: Another measure of internal consistency. This gives information as to how well each half of the measure predicts the overall result. Not as sensitive as the other measures.

Alternate Forms: For some tests, there are in effect two tests that measure the same construct. In these cases, the alternative forms are correlated against one another.

The reliability estimates for the scales of the Berke Assessment are listed below:

Personality Scales

Scale	Measure	Observations	Coefficient
Assertiveness			
	Item Alpha	156350	0.8547
	Scale interitem covariance	156350	0.0799356
	Average item deviation	156350	0.004632143
	Split-Half - odd vs even	156350	0.7802
	Corr - Odd vs total	156350	0.9439
	Corr - Even vs total	156350	0.9429
Sociability			
	Item Alpha	156344	0.8522
	Scale interitem covariance	156344	0.0998369
	Average item deviation	156344	0.005085
	Split-Half - odd vs even	156344	0.7742
	Corr - Odd vs total	156344	0.9358
	Corr - Even vs total	156344	0.9476
	Corr - Neg vs total	156344	0.868
	Corr - Pos vs total	156344	0.8301
Structure			
	Item Alpha	156350	0.7563
	Scale Interitem Covariance	156350	0.081453
	Average item deviation	156350	0.016775
	Split-Half - odd vs even	156350	0.6551
	Corr - Odd vs total	156350	0.9124
	Corr - Even vs total	156350	0.9069
Responsiveness			
	Item Alpha	156350	0.8161
	Scale Interitem Covariance	156350	0.0661837

	Average item deviation	156350	0.007965
	Split-Half - odd vs even	156350	0.6956
	Corr - Odd vs total	156350	0.9152
	Corr - Even vs total	156350	0.9261
Social Adaptiveness			
	Item Alpha	156350	0.812
	Scale Interitem Covariance	156350	0.0766437
	Average item deviation	156350	0.01395
	Split-Half - odd vs even	156350	0.7451
	Corr - Odd vs total	156350	0.9421
	Corr - Even vs total	156350	0.9256
Intensity			
	Item Alpha	156316	0.704
	Scale Interitem Covariance	156316	0.1427963
	Average item deviation	156316	0.05042
Optimism			
	Item Alpha	156350	0.707
	Scale Interitem Covariance	156350	0.0621056
	Average item deviation	156350	0.05316

Cognitive and Skill Scales

Scale	Measure	Observations	Coefficient
Logical Problem Solving			
	Item Alpha	164920	0.8251
	Split-Half - by sentence	164920	0.8429
	Split-Half - by item	164920	0.9705
	Item Alpha - odd	164920	0.6730
	Item Alpha - even	164920	0.6486
	Item Alpha -56789	164920	0.8110
	Odd sen vs total	164920	0.9627
	Even sen vs total	164920	0.9570
	56789 vs total	164920	0.9386

Rapid Problem Solving			
	Item Alpha	156349	0.9143
	Split-Half - by sentence	156349	0.9672
	Split-Half - by item	156349	0.9833
	Item Alpha - odd	156349	0.8344
	Item Alpha - even	156349	0.8132
	Odd sen vs total	156349	0.9919
	Even sen vs total	156349	0.9916
Typing Speed			
	Split Half	152386	0.8245
	Version A vs Total	152386	0.9637
	Version B vs Total	152386	0.9457
Idea Productivity			
	Item Alpha - Scale 1	150377	0.8359
	Item Alpha - Scale 2	150377	0.8458
	Item Alpha - combined	150377	0.9103
	Scale 1 vs Scale 2	152018	0.8163
Spatial Visualization			
	Item Alpha	146037	0.7383
	Scale interitem covariance	146037	0.0116594
	Average item deviation	146037	0.005858824
	Split Half - odd vs even	146037	0.6945
	Corr - Odd vs total	146037	0.9105
	Corr - Even vs total	146037	0.9299
Vocabulary			
	Item Alpha	156366	0.8735
	Item Alpha - odd items	156366	0.7858
	Item Alpha - even items	156366	0.7578
	Split-Half - odd vs even	147257	0.8244
	Corr - Odd vs total	147257	0.9570
	Corr - Even vs total	147257	0.9531

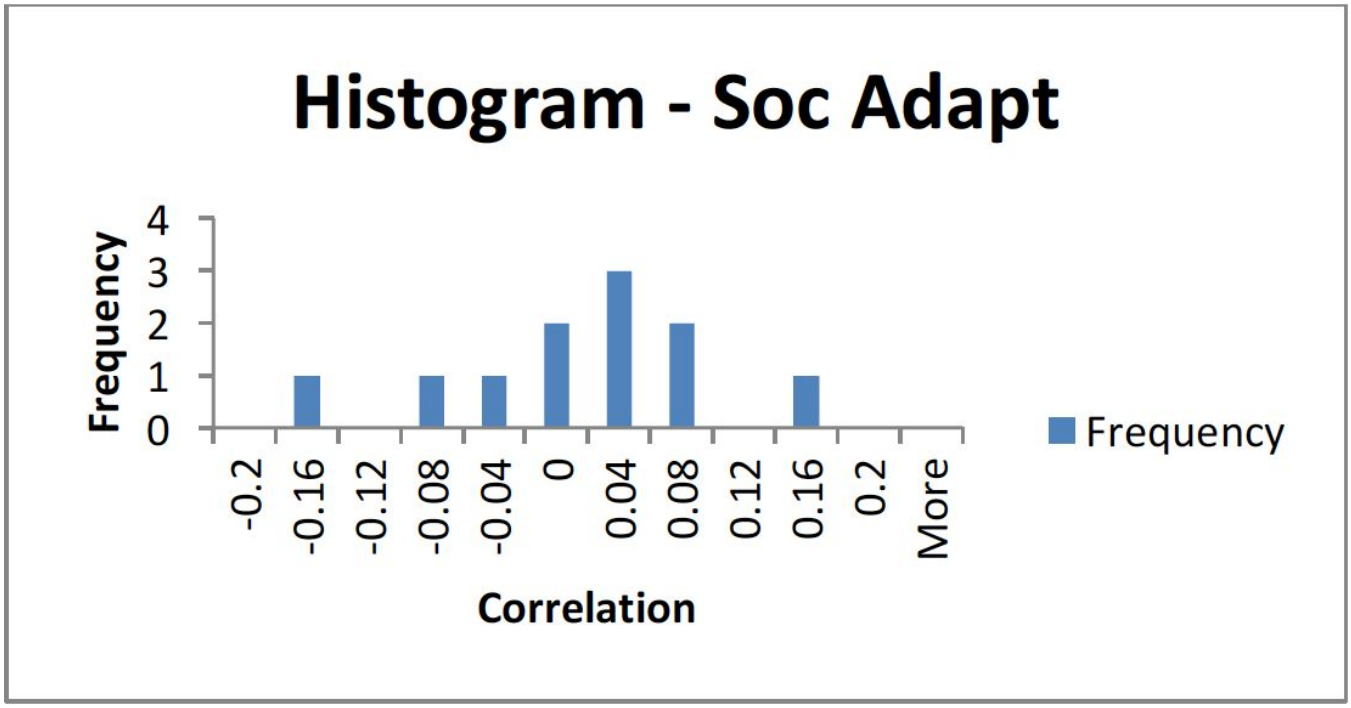
5. Scale Independence

Ideally, with a battery of tests, the scales that make up the battery should be independent of one another. Scales that correlate too strongly to each other are probably measuring the same thing and therefore do not add much additional information. The scales of the Berke Assessment show very good scale independence. The chart below shows the average correlation of each scale with the other scales of the Berke.

Scale	**Average Cross-correlation**
Social Adaptiveness	-0.016
Assertiveness	0.049
Emotional Intensity	-0.038
Idea Productivity	0.114
Logical Problem Solving	0.152
Responsiveness	-0.022
Optimism	0.038
Rapid Problem Solving	0.116
Sociability	0.079
Structure	-0.009
Spatial Relations	0.081
Vocabulary	0.120

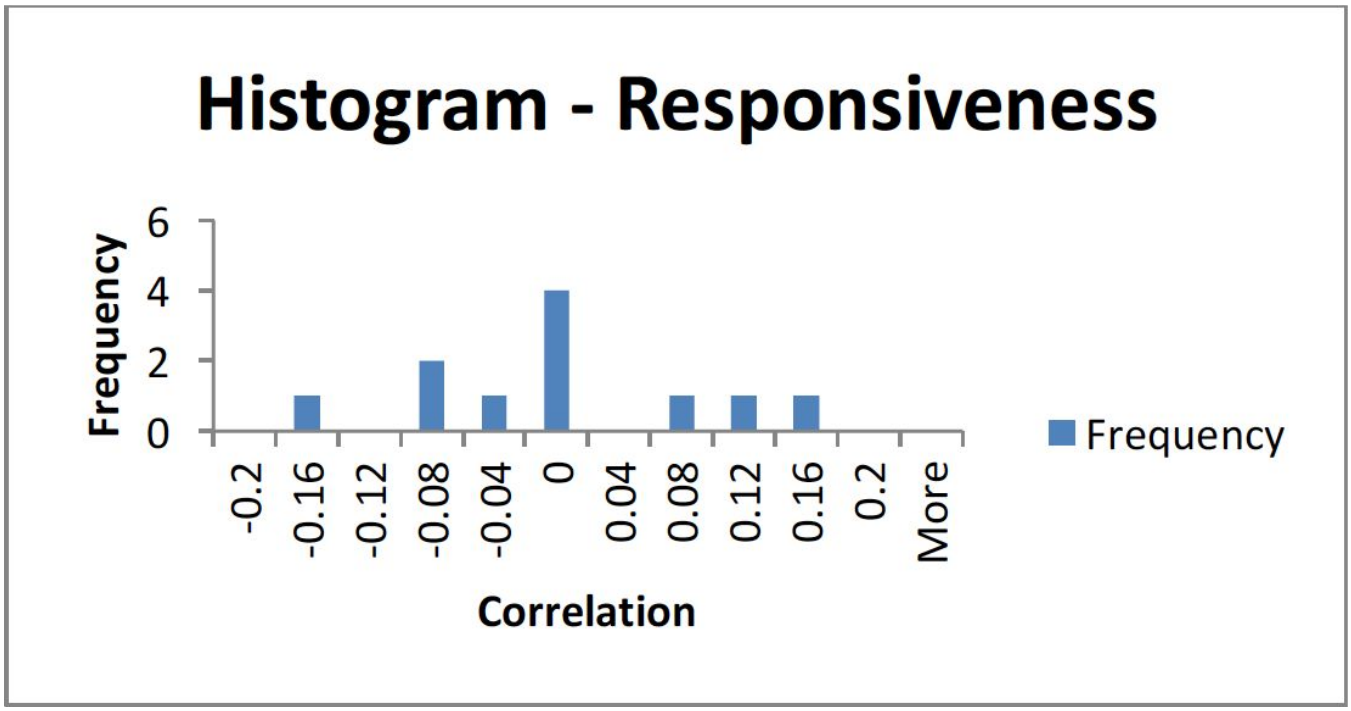
N=138,749

Typically, the personality scales have very low correlations with each other and with the cognitive measures. Here is the distribution of correlations for the personality variable Social Adaptiveness:



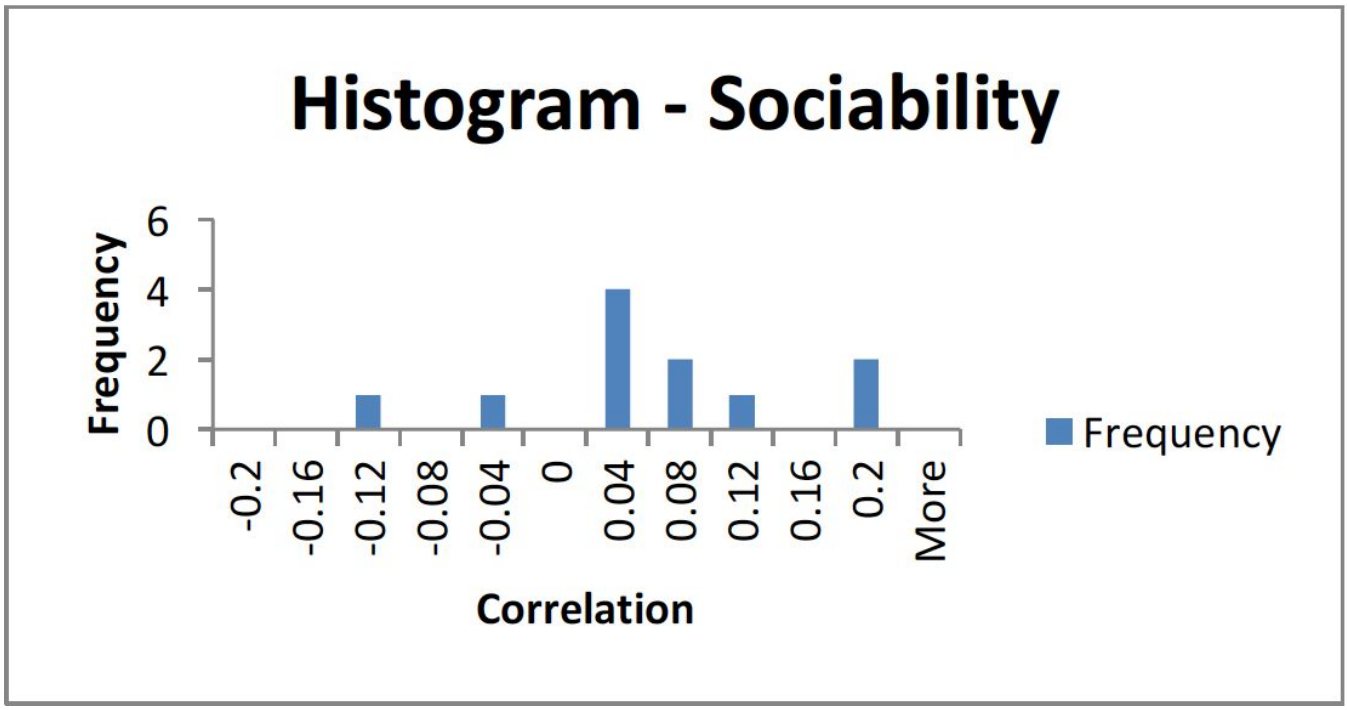
As can be seen, this is fairly evenly distributed between positives and negatives around .04 – a very low number – overall slightly negative.

Another personality measure – Responsiveness:



Again, fairly evenly distributed around 0.0 – overall slightly negative.

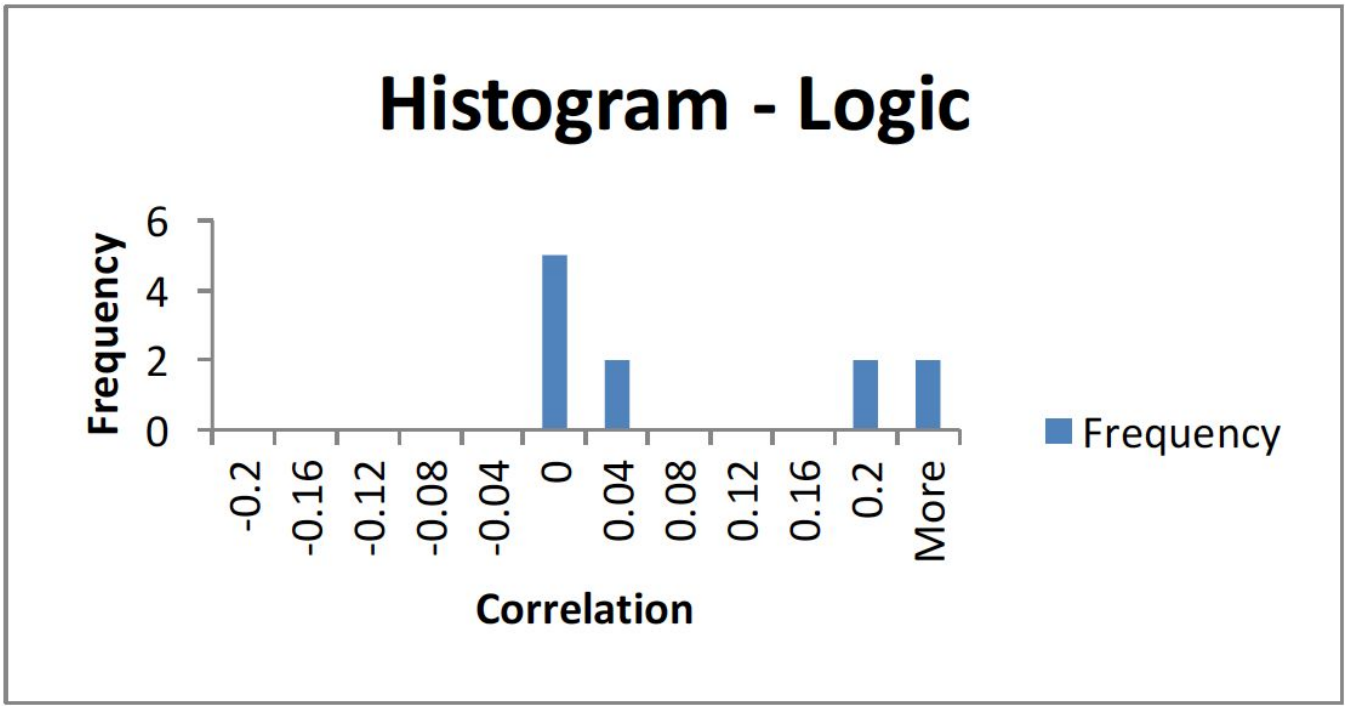
Another personality measure – Sociability:



The high point is 0.04, but more of the correlations are positive. Sociability is more positively correlated than most of the personality measures; however, the correlations remain low.

The cognitive measures are more strongly related to each other than are the personality measures. This is because there is an underlying factor of g (general intelligence) throughout the cognitive measures. So there is a common factor throughout. The tests are designed to get at very different aspects of cognitive functioning, so we do not think they are redundant, and the correlations are still low. The strongest correlation is between Logical Problem Solving and Vocabulary – it is .27. Next is Logical and Rapid Problem Solving (.22), Logical and Idea Productivity (.19), and Logical and Spatial (a measure of Spatial intelligence – the right hemisphere correlate of g (.17).

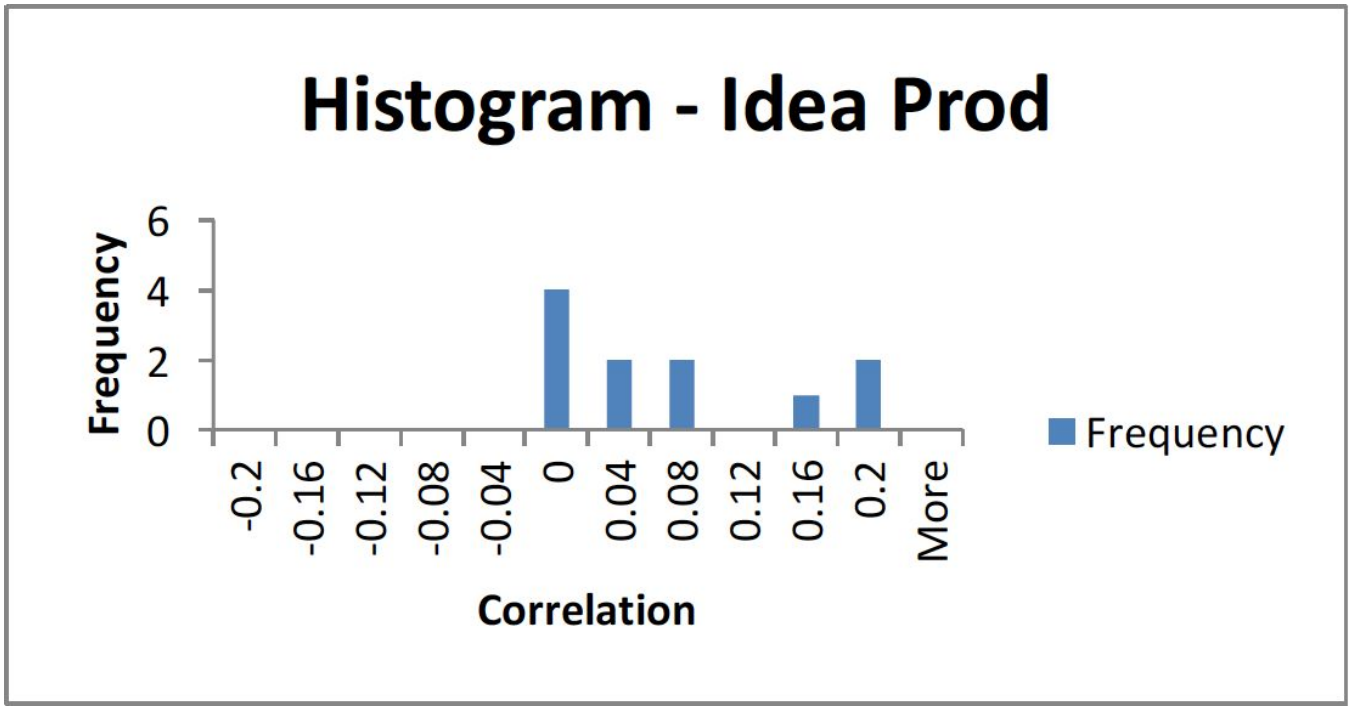
Here is the distribution for Logical:



As can be seen, the cognitive correlations hang out on the right side, while the correlations for the personality measures hover around the center.

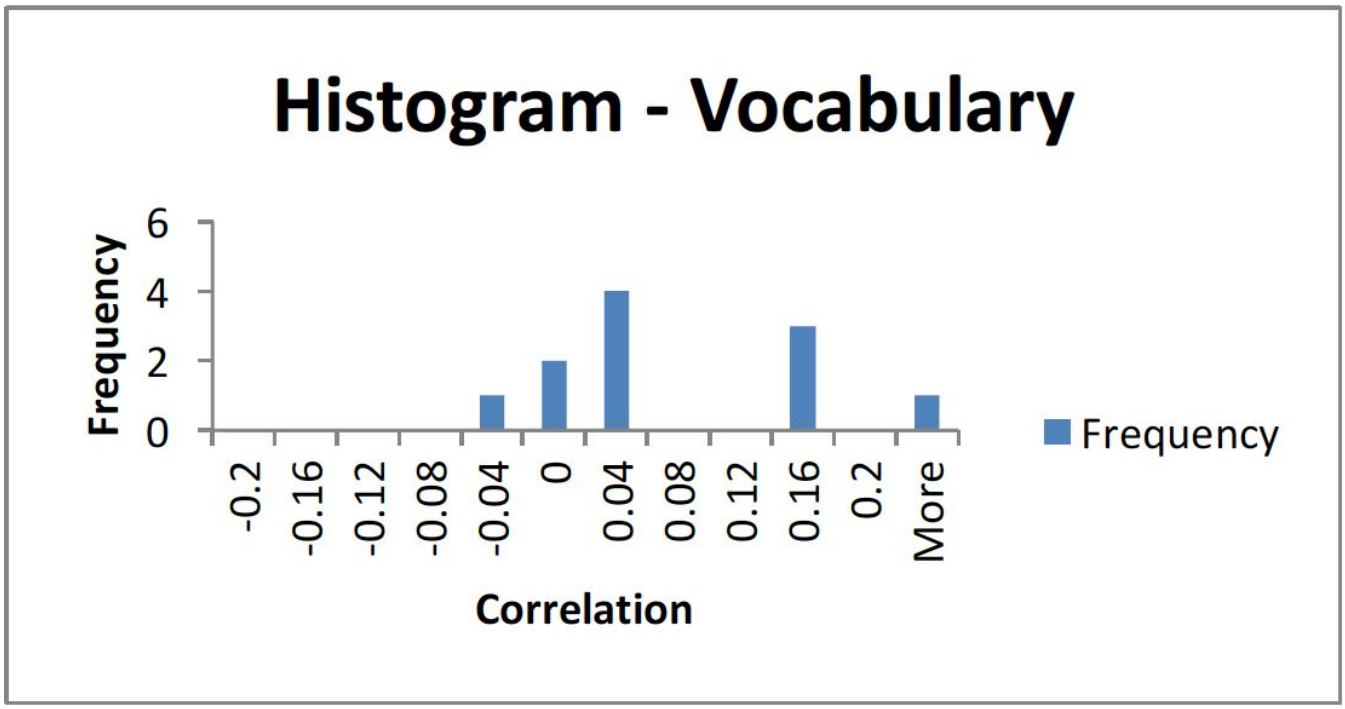
Although all of the cognitive measures are influenced to some extent by g and will show relatively stronger relationships to each other, the relationships are still fairly low.

Here is the distribution for Idea Productivity:



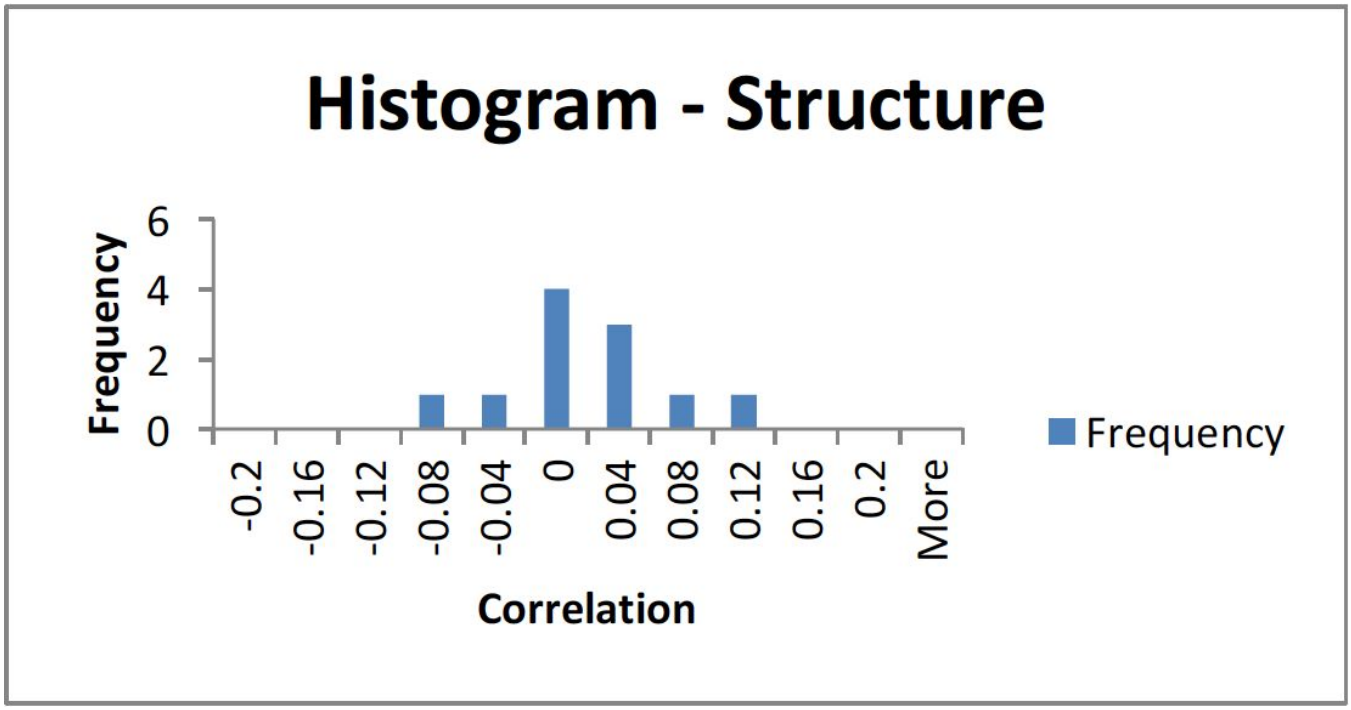
We do not see the stronger correlations as with Logic, and again the personality scales hover around .04.

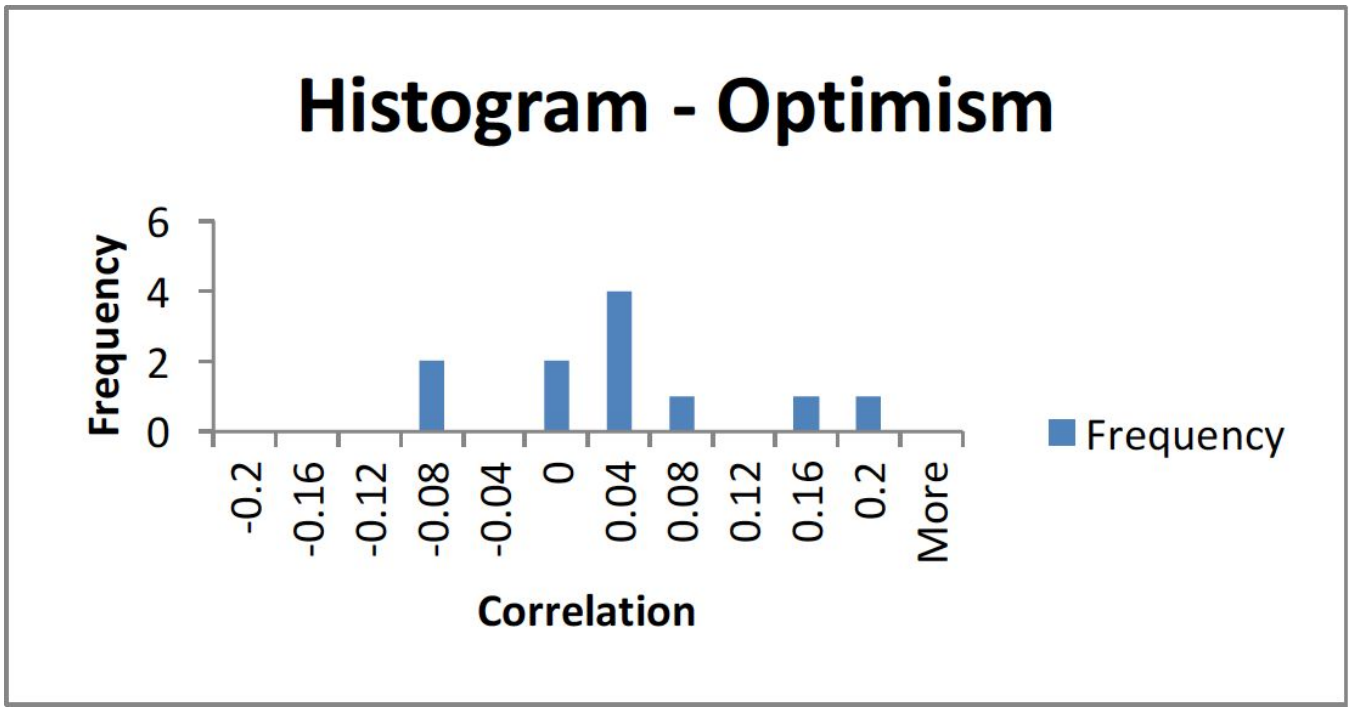
Here is the correlation for Vocabulary:

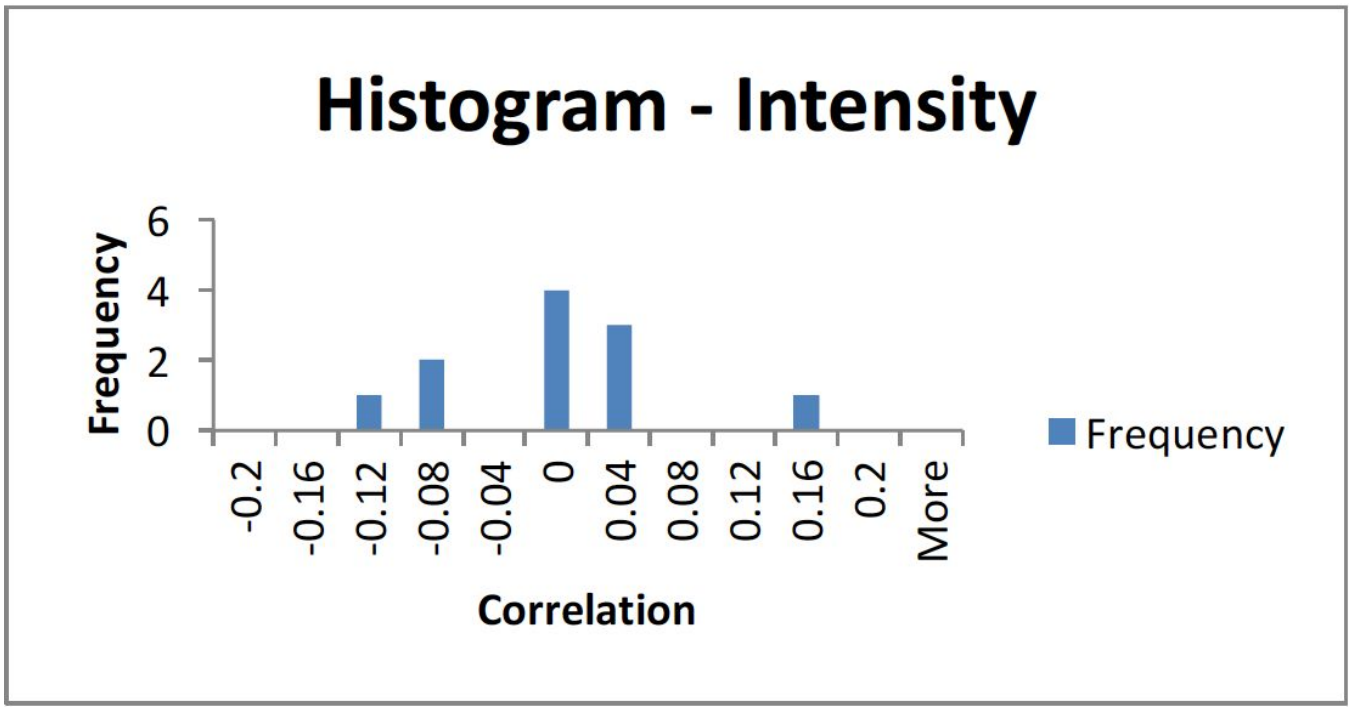


Here again, we see the correlations with cognitive scales hanging on the right, with the correlations for personality scales hovering around 0.0.

Here are the distributions for the remaining three personality scales – Structure, Optimism, and Intensity:

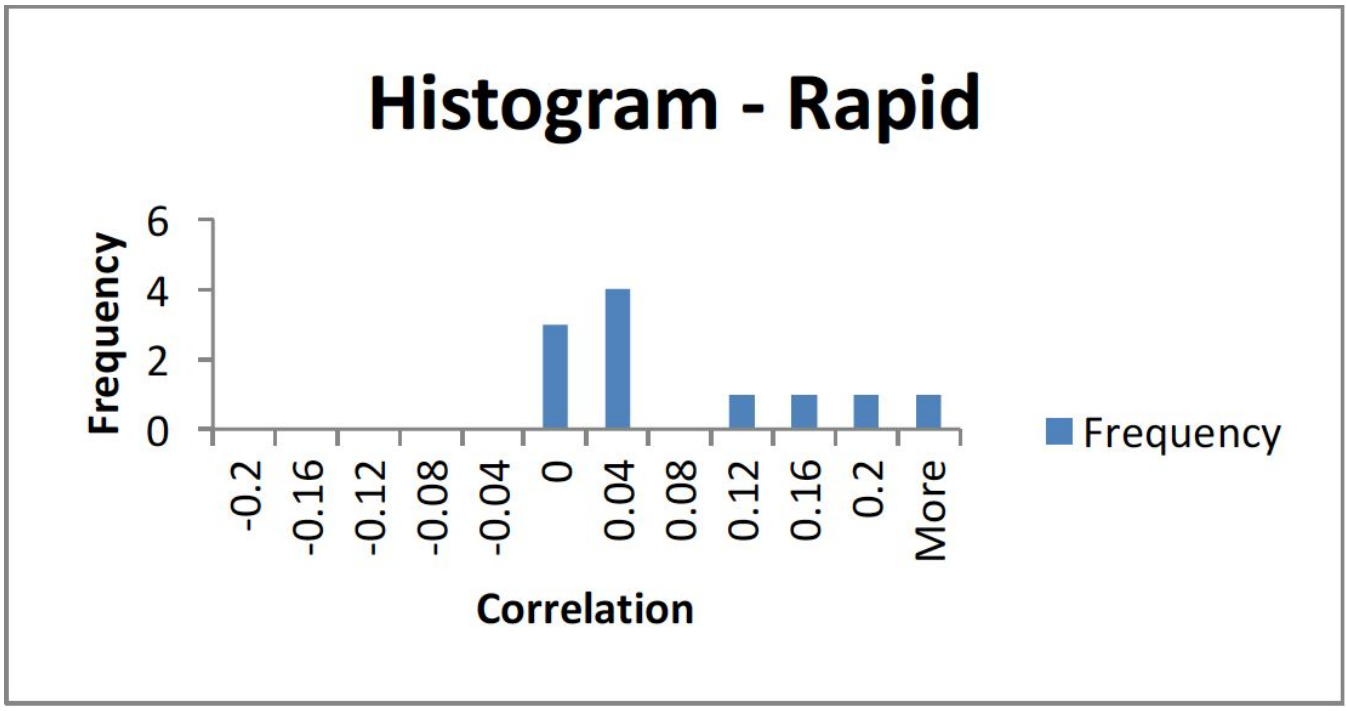


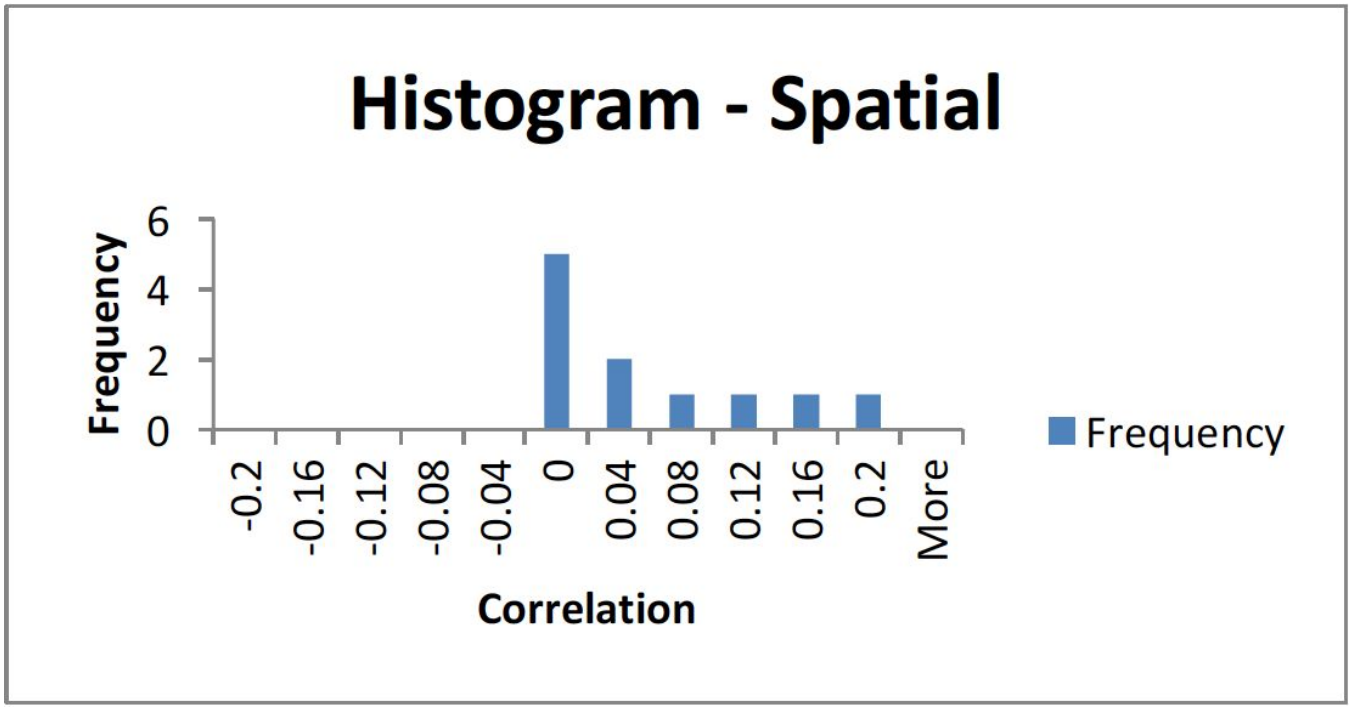




As can be seen, they all follow the same basic pattern for the personality scales.

Here are the distributions for the 2 remaining cognitive scales – Rapid Problem Solving and Spatial Visualization:





These follow the same basic pattern for the cognitive scales.

6. Validity

Berke approached validity in two ways: construct validity and criterion-related validity. In this section, only the construct validity results are presented. Criterion-related validation studies are documented in job studies where specific clients' private data are involved. We used alternative measures to establish a descriptive base for the Berke personality scales. Here we expect lower correlations since we have two completely different measures that purport to measure similar constructs, but in different ways. According to the U.S. Department of Labor's *Testing and Assessment: An Employer's Guide to Good Practices*, one should expect to see validity coefficients from .11-.2 (barely adequate), to .2 - .35 (likely to be useful), to .35 and above (very beneficial).

Construct Validity – Alternative Measure

1. **Personality and Talent Self-Description (PTS)** – a measure of personality and talent dimensions using self-descriptions of behavior.
2. **Job-Related Preference Scale (JRP)** – a measure of personality and talent dimensions using preferences for certain types of job-related behavior.
3. **Job Activity Checklist (JAC)** – a measure utilizing self-report of strength or weakness in job-related activities.

The following correlations were found on the above measures:

Berke Scale	**Personality and Talent Self-Description**	**Job-Related Preference Scale**	**Job Activity Checklist**
Assertiveness	Leader - .334, p<.001	Aggressive - .249, p<.001 Sales - .320 p<.001	Aggressiveness - .555, p<.001 Energy - -.297, p<.001 Leader - .558, p<.001
Sociability	Extroversion - .521, p<.001 Working alone - .487, p<.001 Sales - .296,	Sociability - .520, p<.001 Sales - .519, p<.001	Extroversion - .616, p<.001

	p<.001		
Responsiveness		Emotional Expression - .268, p<.001 Energy - .235, p<.001 Speed - .236, p<.001	
Structure		Thoroughness - .303, p<.001 Rule Driven - .286, p<.001	Thoroughness - .495, p<.001 Structure - .425, p<.001
Adaptiveness	Generalist - .274, p<.001	Sales - .480, p<.001	Conflict Avoid - .203, p<.001
Optimism		Sales - .310, p<.001	Optimistic - .385, p<.001

n=2,987

7. A Note About Systematic Bias and Berke Scales

When we created the Berke Assessment in 2005, our goal was to create a test that was race-blind, gender-blind, age-blind and national origin-blind. Our goal was to create a test that reliably and accurately measured significant aspects of work and performance-related personality and cognitive variables. We pursued several paths to that end.

1. When creating the test, we made every effort to include only words that had clear meanings, and that did not lend themselves to double meanings and emotionally charged reactions or meanings with racial, ageist, gender or national origin connotations.
2. We hired a team of employment lawyers to examine the tests at different stages of development, including the final form, to specifically identify words that could lend themselves to racial, gender, age or country of origin reactions of a charged or emotional nature. We eliminated all such words and phrases from the test.
3. Our guiding philosophy was that the test should, as clearly and accurately as possible, reflect differences in individuals who would be candidates for jobs in the workplace. We do not want to have systematic biases against anyone for the reason of race, gender, age or national origin in the test. We do not wish to establish or research "norms" for race, gender, age or national origin. Rather, we wish to have a test that accurately reflects real differences between people on significant aspects of work in particular jobs, roles and companies and that have been shown to make a significant difference in actual job performance.
4. We have conducted numerous studies of the different scales of the assessment in order to determine whether any of the scales showed significant skew that could be traced to race, gender, age or national origin. Information was collected from candidates who were willing to provide data on ethnic background, country of origin, primary language, age and gender. At the present time, only gender is collected. We collect this for the purpose of writing the report with the correct pronouns (he, she, her, him).
5. Using information collected during the development stage of a Berke scale, we randomly selected multiple samples of 1000 to 2000 people who took the Berke and had provided relevant demographic information. From this information, we extracted samples of people who had taken the Berke who identified themselves as:

    a. African-American
    b. Asian
    c. Hispanic
    d. Caucasian-European
    e. Native American
    f. Indian

g. Male
h. Female
i. Age >50
j. 30<Age<50
k. Age < 30

6. We developed a population estimate for each test from the sample with the sample size, mean and standard deviation. From this, we developed confidence intervals ($p < .05$) using the Standard Error of Measurement.
7. We did not directly compare group to group; however, we compared each group to the population estimate based on the sample from which each group was extracted. In each case, we found that the confidence interval for the mean of the group (Hispanics, for example) crossed the mean of the population from which the group was extracted.
8. Our conclusion was that it was accurate to say that we set up a series of trials in which, had there been significant differences on the measures between a group (Females, or Asian-origin, for instance) and the population from which the group was extracted, then the statistics would have shown that difference. We did not, in fact, see this. We saw that each group scored above or below the population estimate on the measures; however, they did not score far enough below or above the population estimates to show a significant difference.
9. We repeated this procedure several times with randomly selected samples of 1000 to 2000 people. We got the same result each time. We do not wish to publish the specific results from the sample groups (the group averages by test, for example) because we do not feel that this is a generally relevant line of research. We did this research to provide evidence for our goal of race-blind, gender-blind, age-blind and national origin-blind and to highlight any possible deviation from that goal so that it could be corrected. We did not find such evidence.

Our goal from the beginning has been to create a test that would reflect real differences between individuals in work-related behavior and personality traits. Our research is mainly targeted toward identifying and measuring those traits that are demonstrated to have significance in actual work outcomes. Our efforts have also been targeted toward eliminating as much as possible systematic bias that would yield unfair results for any particular ethnic, cultural, racial, or age group.

8. Conclusions and Proper Use of the Berke Assessment

When we examine the overall data concerning the validity of the Berke Assessment, we see a consistent, strong correlation between managers' ratings of participants and the participants' scores on the Berke Assessment. This correlation holds true across many different types of jobs, industries, and companies. There are several points that should always be kept in mind, however:

- The most accurate results on the Berke come from the aggregated scores of all of the scales, not just from one scale.
- The results on the Berke are keyed to individual positions and roles in individual companies.
- Some scales are more predictive than others for particular roles, positions, and companies. The relative predictiveness of scales can be obtained from careful research in different roles.
- The studies reported in this Technical Manual were based on managers' ratings of people in specific positions. The results obtained are only as accurate and consistent as the ratings provided by the managers.

When we look at all of the data reported here, the following relationships hold:

	Manager Ratings		
Berke Match:	A	B	C
High or Medium High	84%	52%	20%
Medium Low or Low	16%	48%	80%

Of those individuals who matched a given role either High or Medium-High on the Berke, 84% were rated A by their managers. Of those who matched either Medium-Low or Low on the Berke, 80% were rated C by their managers.

The Berke Assessment is intended to aid managers in hiring new employees or in hiring from within the company. It is not intended to be used as the sole criterion for hiring, but rather as the source of additional information for the hiring managers to be corroborated through comprehensive interviews and reference checks. As can be seen from the percentages above, the Berke offers significant and valid information when one is trying to determine the suitability of a particular person for a particular position within a company. It should always be used as one piece of information in the overall process of hiring. It should never take the place of interviews, background checks or job history searches

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