SkillCheck Validation Information

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Statement of Validity

SkillCheck tests are designed to measure the core critical skills and knowledge required to perform specific jobs. Research and analysis of jobs were conducted on software application use, data entry tasks, typing, accounting, telephone skills, clerical skills, workplace safety, industrial skills, essential basics and other job-specific skills, knowledge and abilities by the test developers at SkillCheck. Research is continually being conducted on past tests and newly developed tests in a process of ongoing improvement.

SkillCheck tests comply with the **applicable sections and guidelines** of the ***Uniform Guidelines on Employee Selection Procedures*** (**41 CFR 60-3**), as well as the ***Standards for Educational and Psychological Tests*** developed by the *American Psychological Association*, the *American Educational Research Association*, and the *National Council on Measurement in Education*, and the ***Guidelines for Educational and Psychological Testing*** developed by the *Canadian Psychological Association*.

In addition to using subject matter experts (SMEs) and credentialed professionals for test development, SkillCheck tests may be cross-referenced with standardized occupational and labor resources, including the Dictionary of Occupational Titles (DOT), the Occupational Outlook Handbook (OOH), and the Occupational Information Network (O*NET). In many cases, SkillCheck tests may be cross-referenced to industry-sponsored and industry-developed criteria and standards for certification and professional development.

The content of **all** SkillCheck tests have high levels of content validity as measured and reported by subject matter experts. Criterion-related validity studies have yielded (and are expected to continue yielding) high relationships with job performance since tests are designed with a specific focus on and analysis of the job tasks, skills and abilities required to perform the job. Studies in this area have been conducted and are presently being implemented for many of the tests.

Reliability, which is a necessary condition for the validation of test scores, is within and above the range of most skill-based tests in the industry. This assures the test user of accurate measurement and very useful information for decision-making.

Users of SkillCheck tests can feel confident that the information produced from a SkillCheck test will supply reliable and valid information that may be used as an important part of their screening, assessment and human resource decision-making processes.

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About SkillCheck, Inc.

SkillCheck, Inc. is a leading international supplier of testing software for the staffing services, human resource, training, education and certification industries. SkillCheck products are used by the world's largest temporary services and are available in multiple languages.

SkillCheck's products combine validated, Standard tests of the highest quality with the flexibility to create and customize tests from a database of over one hundred questions per software product or job skill. This unique feature allows SkillCheck users to create tests that can meet an organization's job-selection guidelines, applicant screening procedures, education and training curricula.

About Validity

Validity is the extent to which a test accurately reflects the attributes or skills being measured by the test. Validation is the process of determining through various means that a test is an accurate reflection of such attributes or skills.

It is important to remember that a test in and of itself cannot be considered "valid." Rather, a test is described as a valid tool for determining a particular characteristic, such as the skill required to handle a particular job. For example, a test on typing or word-processing skills can be considered a valid assessment of a candidate applying for a job as an administrative assistant that requires typing and word-processing ability. Using those same tests to measure a candidate's ability to handle other types of jobs (such as machine operators or computer programmers) would represent a less valid assessment of skills needed for those non-clerical jobs.

Claims to validity for a particular test should never extend beyond the attributes or skills being measured. When using testing products, such as those provided by SkillCheck, to make hiring or other job-related decisions, the test developer has a responsibility to accurately describe the purpose of the test and to provide a test that supports the purpose for which the test is intended. The test administrator also has responsibility to ensure that tests are being given to job candidates that reflect the job or skills for which they are being tested.

Further discussion of test developer and test administrator responsibilities appears on pages 5-6.

A more detailed explanation of validity and the validation process appears in the appendices at the end of this document.

Approaches to Demonstrating Validity

There are multiple ways to demonstrate validity of a particular test. Strategies used by SkillCheck include ***content-oriented validation***, ***construct-oriented validation*** and ***criterion-oriented validation***.

A brief description of each type of validation appears on the following page.

Content Validity	Proof, normally provided by subject-matter experts, that items in a test cover the most important and frequently used knowledge, skills and abilities needed to accomplish the job being measured by the test. For example, a test on Microsoft Word can be said to be content valid if it can be proven that the subject matter covered in the test (setting margins, printing, etc.) represent the most important and frequently used functions critical to the success of a Microsoft Word user. A more detailed description of content validity appears in Appendix A of this document.
Construct Validity	Proof that the individual items in a test are accurate measurements of the subject being tested. For example, an item that asks an applicant to set margins within an interactive, performance-based simulation of Word or within a concurrent test that uses the real Word program use a near-perfect construct to measure someone's ability to perform a task (in this case, set margins). A multiple-choice question that asks: "Which menu contains an option to change margins?" is a less exact construct for measuring the same function. A more detailed description of construct validity appears in Appendix A of this document.
Criterion Validity	Proof that the overall test accurately correlates with some other independent measure. For example, assessing a test taker's on-the-job performance with Word one month after they have taken a Word test and seeing if test scores accurately predicted job performance is one type of criterion validation method known as **predictive** validation. Alternatively, a test can be administered to people whose job skills are already known and test scores can be correlated with an independent measure of those skills. This type of validation is known as **concurrent** validation. In both cases of criterion validation (predictive and concurrent) it is important that independent assessments be generated blind to test scores. It is also important that the instrument used to perform an independent validation of skill level (normally some type of survey form) be utilized in a consistent and well-defined manner. A more detailed description of criterion validity appears in Appendix A of this document.
Selecting a validation method	SkillCheck uses a variety of methods to establish validity of its Standard tests for particular knowledge or skills. A description of validation performed by SkillCheck appears on page 8 with supporting documentation in Appendixes A-D and G of this document.
Considerations in Choosing a Pre-	When selecting a pre-employment test for purposes of making hiring decisions, an HR Professional should consider the following important

Employment Test Considerations in Choosing a Pre-Employment Test (continued)

issues:

- The quality of both a testing product being used and the validation information supporting such products
- The development processes used by a test developer to create its testing products, and the adherence to test development standards by such organizations as the Association of Test Publishers and other recognized authorities on testing
- The ability of tests to withstand legal scrutiny in the marketplace. (SkillCheck tests have been used to test hundreds of thousands of job candidates by the staffing-services industry alone with no legal challenges.)
- The suitability of a testing product or test battery for a particular job or purpose
- A clear understanding of the responsibilities of both test developers and test administrators, as described on page 5-6 of this document

Skills tests, like the performance-based tests provided by SkillCheck, have been used to test candidates for job positions for over fifteen years and are generally understood as being an accurate, fair and legally safe methodology for assessing important skills needed for hiring decisions.

Legal Issues

It should be kept in mind that not all testing programs require the same level of validation for specific tests to withstand legal scrutiny. For example, a test used to determine placement in a particular training program can be said to be "valid" if the test reflects the content of the training curriculum (i.e., that test questions map to training objectives) and that the test questions reflect valid constructs of the objectives being tested.

When tests are being used to make hiring decisions, most legal challenges center around so-called "adverse impact" surrounding protected groups such as women and minorities. To date, no skills test developed by SkillCheck, Inc. has ever faced legal challenges on grounds of general adverse impact. SkillCheck's own validation studies (including those conducted for third-party customers such as Accenture) reflect no significant variance in scores between different groups. Also, the quality of the construct of most skills tests (particularly those involving performance-based testing) makes such testing inherently difficult to challenge as "unfair" or discriminatory against any particular individual and group.

In general, adherence to responsible professional procedures by both test developers and test administrators, as described below, can ensure minimal risk of legal challenge.

Further information legal issues surrounding testing appears in Appendix A of this document.

Test Developer Responsibilities

Test developers, particularly developers of tests used for pre-employment screening, have a responsibility to create tests that are fair, accurate and free from bias.

Test Developer Responsibilities (continued)

To ensure test quality and fairness, test developers have a responsibility to:

- Create tests that include accurate and clearly worded questions (i.e., tests free from confusing or so-called "trick" questions)
- To utilize, whenever possible, the best construct for testing a particular skill or attribute (i.e., utilizing performance-based testing when this type of testing would provide the best measurement of the skill being measured)
- Create tests that include questions that accurately cover the domains of knowledge that reflect the job or skill being tested
- Ensure that tests do not discriminate against any person or group
- Adhere to best practices in test development as described in such documents as **The Association of Test Publishers** (ATP) guidelines or the **Canadian Psychological Association's** *Guidelines for Educational and Psychological Testing* (www.cpa.ca/guide9.html).

Test Administrator Responsibilities

Even utilizing the highest-quality test products, such as those provided by SkillCheck, Inc. does not eliminate the need of a test administrator to exercise professional judgment and utilize best practices when administering tests and making decisions (particularly employment-related decisions) based on an analysis of test results.

Test Administrator responsibilities include:

- Maintaining a testing environment that is quiet, comfortable and free from distractions
- Ensuring that testing takes place under consistent conditions (i.e., the same room, the same time constraints applied equally to all candidates) to ensure that a variance in scores between candidates is not the result of any external factor not related to the test itself
- Administering appropriate tests to candidates (i.e., individual tests or test batteries that correspond to the job, skill or set of skills being measured)
- Using good professional judgment in analyzing test results
- When making employment decisions, integrating test score information into other appropriate measures (performance during an interview, letters of recommendation from previous jobs, etc.), rather than relying entirely on test results to make employment decisions

Test Administrator Responsibilities (continued)

In general, it is important for a test administrator to understand that test results are an important measure of certain skills and attributes (typing speed or word-processing skill in the case of skills testing), or attributes (such as reliability and ability to work independently in the case of psychological testing). However, test scores in and of themselves should not be used as the sole basis for making important decisions.

Rather, a good test administrator will interpret test scores appropriately (comparing scores to other candidates who have taken the same test or set of tests in the same environment), will use testing as a basis for further understanding a candidate's strengths and weaknesses (using test scores to probe more deeply during the interview process, for example), and will make decisions based on the full range of information available.

A valuable description of best practices for test administrators can be found in the **Canadian Psychological Association's** *Guidelines for Educational and Psychological Testing* (www.cpa.ca/guide9.html).

Performance-Based Testing

Performance-based testing refers to testing which asks a test candidate to perform a task in a real-world environment. That environment can be the same one in which a job-task is actually performed (i.e., asking a candidate for a position of auto mechanic to perform an operation on an engine under the supervision of a trained evaluator) or a simulation of a work environment (i.e., a simulation of a software product in which a candidate is asked to perform an operation such as printing or editing).

For purposes of testing skills, performance-based testing is usually superior to knowledge-based testing utilizing traditional "linear" test items (such as multiple-choice, fill-in-the-blank or matching items). For example, swimming ability is best determined by observing one's actual swimming skills, rather than taking a written test on swimming methods.

Many SkillCheck tests are performance-based, utilizing simulation technology to test candidate's skills at typing, data entry or the ability to use a software program. In general, a performance-based test item is only as good as the quality of the test construct (such as the depth and quality of a software simulation). For example, SkillCheck software simulations ask candidates to perform complete software tasks within a high-fidelity simulation of a software product, giving the candidate access to all pathways and methods needed to answer a question. As a case in point, Microsoft Word offers over 150 methods for opening a document, all of which are simulated accurately in a SkillCheck performance-based item on this particular skill.

SkillCheck Subject-Matter Experts (SMEs)

SkillCheck employs highly qualified subject matter experts in the development process of all of its testing products. The development of SkillCheck's software skills tests, for example, utilize over twenty subject matter experts, all of whom are intimately familiar with the applications for which they are creating test questions.

SkillCheck Subject-Matter Experts (SMEs)

In many cases, a subject matter expert will have been researching and programming questions for a particular application for several years. Many SMEs involved with Microsoft Office test-item development, for example, have programmed test questions for multiple versions of Office applications (Office 4.2, Office 95, Office 97, Office 2000 and Office XP) in multiple languages. In combination with SkillCheck's thorough research and development methodology described below, SkillCheck's subject matter experts ensure accuracy, reliability and quality in the development of each test item.

In the case of tests on various knowledge-based areas (such as accounting knowledge or medical office knowledge), internal or external subject matter experts are involved with each step of the test development process, including research, development of test blueprints, creation of test items, and the technical and psychometric review of questions and tests.

SkillCheck Development Processes

The quality and reliability of SkillCheck's testing products are direct results of the development process followed in the development of all SkillCheck test items and tests. That development process consists of several critical steps:

- **Research** - Before any test-item programming takes place, each test item is the subject of extensive research to ensure that performance-based test items maintain a high-fidelity to the knowledge or skill being tested and that all test items are free from problems such as ambiguous wording, poor distracters or other issues that would prevent an item from accurately measuring what is being tested.
- **Documentation** - Each test item is carefully documented by SkillCheck's development/research staff, who are required to develop a "blueprint" that reflects all program pathways to be programmed in developing test items.
- **Review** - Product documentation is subject to substantial crosschecking and review by subject matter experts (SMEs) before a SkillCheck testing product continues on to programming. Each step of the development process (item research, documentation, programming) is subject to "peer review" by SMEs other than those who conduct the initial research. In the case of software simulation tests, each SME is working with the actual program to constantly check accuracy against the software being simulated.
- **Development** - Only after a test item has gone through the

extensive documentation and review process described above is that research forwarded to a programmer who will develop the test item as specified in the item "blueprint."

- **Item Review** - As with the original research, programming of each test item is subject to multiple-phases of review by SMEs and by SkillCheck's QA department to ensure compliance with the item blueprint and accuracy in reflecting the functionality of the actual software.
- **Test Construction** - Because SkillCheck's products consist of comprehensive databases of test items (for example, SkillCheck's Microsoft Word XP product includes almost 200 performance-based items on different features of the latest version of Microsoft Word), the selection of test items for inclusion in a Standard test is based on SkillCheck's content validation research described in Appendix A of this document.

SkillCheck Development Processes (continued)

In addition to providing a set of Standard tests upon which further validation research is based, SkillCheck also provides test administrators with the ability to create their own custom tests using tools that provide access to all of SkillCheck's performance-based and linear test items.

Issues regarding validation of such customized tests are discussed below and in Appendix D of this document.

Validation Studies on SkillCheck Products

SkillCheck's validation studies are based on the Standard tests that cover knowledge and skills, such as the use of particular software products. For example, SkillCheck's Microsoft Office test package includes Standard tests for knowledge and skills in using Microsoft Word, Microsoft Excel, Microsoft PowerPoint, etc. Items for these tests were selected based on a content validation study performed by Linkage, Inc., one of the world's most respected HR consulting organizations in testing and assessment.

Content studies, including work by Linkage and the development of test blueprints under the supervision of trained psychometricians from The Donath Group (developers of important certification programs like Comtia's A+) are used to determine which questions are included from SkillCheck's test databases in Standard tests. Linkage's content study for SkillCheck's Standard tests for software product knowledge and skills appears in Appendix A of this document. Copies of the test blueprints used to establish content validity for other skills (accounting, call center, etc.) are available upon request.

As noted in the description of the SkillCheck development process above, the extensive research, documentation, development and QA procedures for each test item ensure that the construct used in all of SkillCheck's performance-based test items is a high fidelity, near-perfect simulation of the product being tested. The combination of

SkillCheck's high-quality constructs and selection of test items for its Standard tests based on content studies involving input from multiple subject matter experts ensures SkillCheck's adherence to important standards for both content and construct validity.

Validation Studies on SkillCheck Products (continued)

The strength of SkillCheck's tests as valid assessments of particular knowledge and skills is reflected in additional validation studies performed by third parties. These include a criterion-based validation study performed by Linkage, Inc. (a sample of which appears in Appendix B of this document) and subsequent statistical analysis of several SkillCheck Standard test products by The Donath Group (samples of which appear in Appendix C). These studies attest to the high reliability of SkillCheck's Standard tests, and their accuracy in reflecting performance on the job.

It should be stressed that SkillCheck's validation research and studies are based on the Standard tests that come with each SkillCheck testing product. Validity issues regarding tests created or modified with SkillCheck's test development tools are described on page 10.

A Note on Product Versions

Some of the statistical studies of SkillCheck's software assessments were based on the Microsoft Office '97 test suite that includes testing on Microsoft Word, Microsoft Excel, Microsoft PowerPoint and Microsoft Access. These products have been standard in the office-software industry for many years, and the Microsoft Office suite has been updated several times to include Versions Office 2000, Office XP (also called Office 10) and Office 2003 (Office 11).

Initial content studies combined data from analysis of several products in a particular category (Word, WordPerfect and WordPro for word processors, Excel and Lotus 1-2-3 for spreadsheets, etc.), in order to determine the key features needed for a Standard test in which the target for content validation was a clerical employee utilizing a specific software product. In some cases, this content analysis was extendable to other jobs (for example, a clerical employee and an executive would most likely use the same features of Microsoft Word). In other cases, the results cannot always be generalized (for example, a clerical employee would utilize a spreadsheet product like Microsoft Excel differently than an accountant).

For purposes of the SkillCheck Standard tests (the fixed-form assessments upon which our validation research was conducted), subsequent analysis was performed to determine if the research undertaken on Microsoft Office '97 applications could be applied to subsequent versions.

This research began with a qualitative analysis of the changes in the Microsoft products themselves, and how those changes might affect

people's ability to answer questions on the specific features included in the SkillCheck Standard tests. With some new releases, Microsoft introduced new interface elements (such as a new Task Pane introduced with Office XP), as well as new features to the product (such as new groupware features in Microsoft Office XP and 2003). It was determined that while new ways of accessing certain features have been added in newer versions of Office, the original interface elements remain unchanged enough that questions in the SkillCheck Standard tests can be performed using the same procedures for all versions of Office (not just versions subsequent to Office '97, but versions previous to Office '97 as well).

A Note on Product Versions (continued)

As part of a separate study, SkillCheck determined the most important, frequently used features of several Microsoft Office applications, both through a survey of subject-matter experts (SMEs) and through an analysis of over a dozen existing training programs and products (including CBT and eLearning, educational textbooks, courseware and classroom materials) to determine how experts involved with the development of such material classify features of Microsoft Office products in terms of Beginner, Intermediate and Advanced functionality. These studies indicated that the features of the product covered in SkillCheck's Standard tests are still the most critical features for the target of our Standard test validation: a clerical employee making use of one or more of these products.

Statistical analysis of Office 2000 and XP applications yielded similar results to the same type of analysis performed on Office '97 applications, indicating that those validation results are generalizable to subsequent versions of the same products. In general, the greatest impact of product updates is the inclusion of new high-end features that do not play a role in the day-to-day use of the product, and thus are not relevant to the Standard tests upon which SkillCheck's validation research is based.

SkillCheck's development of questions on advanced features allow customers to create custom tests or advanced tests using questions that are not included in (and beyond the scope of validation) on SkillCheck's Standard tests (see below).

Test Customization and Creation

In addition to providing Standard tests for particular products or skills (Microsoft Word, Typing, etc.), SkillCheck also provides tools that allow test administrators to create and modify their own tests for particular purposes. These include:

- A test development utility that allows administrators to create tests that include any SkillCheck performance-based or linear test item in a single test
- An ItemWriter utility that allows administrators to create their own linear test items to be included alone in tests or in

combination with any SkillCheck-developed performance-based or linear test item

- A Typing Test Maker that allows administrators to create typing tests based on their own documents
- A Data Entry Test Maker that allows administrators to create data entry tests based on their own data and forms
- A linear Test Maker that allows administrators to create their own simple tests that include multiple-choice, true-false or fill-in-the-blank questions with text and graphics

While SkillCheck's own validation claims are based on the Standard tests included with each SkillCheck package (tests SkillCheck has created with the same test development tools provided to test administrators), the inclusion of such test development and customization utilities imposes an extra layer of responsibility on test developers and administrators to ensure that appropriate professional judgment and care is placed on the use of these tools to create custom tests.

Test Customization and Creation (continued)

Different levels of validation are required for tests performing different functions. For example, a test developed to help screen candidates for a particular training program need not go through the same level of validation as a test used to make hiring or other job-related decisions. In the case of a training pre-assessment, close adherence (or mapping) to a training program curriculum represents the same type of test responsibility as a job-related content study for tests used for job selection.

While SkillCheck cannot provide any validity claims for tests developed by third parties using SkillCheck's test development tools, Appendix D of this document (written by Linkage, Inc.) provides a description of the responsible use of test development tools to create tests for different purposes. In addition, SkillCheck's testing product includes a wide variety of tools for both developing tests and analyzing the performance of tests and test items, allowing test administrators to use SkillCheck testing software to both create custom tests for particular jobs, training and education programs or other purposes, and to analyze their effectiveness in the development of an organization's own validation materials.

A full description of SkillCheck's test development and analysis tools appears in the complete SkillCheck product manual.

EEOC Guidelines

In 1978, the United States Equal Employment Opportunity Commission (EEOC) published the *Uniform Guidelines on Employment Selection Procedures* that outline proper responsibilities in hiring practices.

The *Guidelines*, available from the United States government and online at http://www.dol.gov/dol/allcfr/Title_41/Part_60-3/toc.htm cover all aspects of employment decisions, from hiring and retention to promotion and training to demotion and dismissal. A detailed discussion of how the *Guidelines* relate to testing, such as the testing available from SkillCheck, Inc., appears in Appendix F of this document.

With regard to testing, Section 703(h) of the Act states the following:

Section 703(h) of the Act provides that "notwithstanding any other provision of this subchapter, it shall not be an unlawful practice for an employer . . . to give and to act upon the results of any professionally developed ability test provided that such test, its administration or action upon the results is not designed, intended or used to discriminate because of race, color, religion, sex or national origin."

The *Guidelines* also describe the acceptable methods of determining validity for testing, including Content Validity, Criterion Validity and Construct Validity, the validation methods discussed earlier in this document with regard to validation of SkillCheck and other testing products.

EEOC Guidelines (continued)

As discussed in Appendix F, the use of testing is widely accepted as an objective method that can contribute to fair hiring decisions. As long as testing is provided in a consistent manner, that tests are chosen which meet a clear business need for a particular job, and that no aspect of the hiring process can be shown to discriminate against any protected group, employers can feel comfortable that the use of testing products (especially objective instruments such as skills testing products) are not likely to subject them to legal action.

It should be noted that SkillCheck products have been used to test hundreds of thousands of employment candidates worldwide without any SkillCheck customer (including the world's largest staffing services) ever having been subject to legal action or legal scrutiny by the EEOC.

Executive Summary

Statement of Validity

SkillCheck Standard tests, the default tests included in SkillCheck Professional, SkillCheck Professional Plus and a number of other SkillCheck computer-based testing systems, are valid (i.e., appropriate and meaningful) simulations of the tasks that employees complete while using the software applications. Linkage, Inc., bases this statement of validity on a series of content-oriented validation studies, which utilized the input of subject matter experts (SMEs). These SMEs have used the various software-applications in a variety of clerical jobs as temporary employees.

The SkillCheck Standard tests are simulations that we found to be direct representations of the tasks involved in the use of the relevant software application (e.g., Use of Word for Windows, Use of Excel, etc.) Additionally, we took steps to ensure that Standard tests appropriately represent all of the tasks that are encountered in the typical use of the applications. More critical/frequent tasks are represented by more items and less critical/frequent tasks are represented by fewer items. For example, SMEs reported that six types of tasks (customizing, desktop publishing, editing, file management, formatting and printing) are encountered when using one of the specific word-processing applications. They further reported that printing tasks are more critical and frequent than customizing tasks. Therefore, Standard tests for word-processing skills contain more items related to printing than to customizing.

Validation Method

In developing SkillCheck Standard tests, we ensured content validity in four steps:

1. SMEs identified the major task-clusters in the job element associated with use of the application.
2. SMEs rated the criticality and frequency with which each task-cluster is used on the job.
3. SMEs indicated the task-cluster(s) that each item represents.
4. Using the data generated by the SMEs, we selected a group of items, which is referred to as The Standard test.

As a result of this four-step process, the Standard tests appropriately represents the criticality and frequency of the task clusters within the relevant job element. Because the number of test items in each task-cluster is approximately proportional to the rated criticality and frequency of each task cluster, we are confident that the items are a representative sample of the tasks in the job element. Additionally, we selected items that the SMEs rated as critical and frequently used.

Further Validation of the Tests

Further information on validation and the approach used to develop this statement of validity is described below under *Validation and Use of SkillCheck Tests*. Additional validation of the SkillCheck product line is planned. In the coming months, Linkage, Inc., will conduct a series of studies to demonstrate the predictive strength of the simulations. These studies will investigate the ability of the tests to predict employees' performance.

One can develop custom tests for a variety of uses with the testmakers provided by SkillCheck. The Software Testmaker allows you to create tests by selecting specific items from a database of one hundred or more questions for each software product, and the SkillCheck TestMaker allows you to create automated text-based tests containing multiple-choice and true-false questions. Tests created using these testmaking tools are not necessarily valid. (Items in the software question databases have not been individually validated.) Thus, before any custom test that has been created using the testmakers can be described as valid, an employer should take steps to substantiate this description. Appendix D of this document include guidelines for validating customized tests.

Conclusions

A limitation to this statement of validity should be made. Our research indicates that the SkillCheck Standard tests are representative samples of the task-clusters in the jobs performed by our sample of SMEs. Common sense suggests that all software end-users will perform a mixture of tasks that are similar to the tasks performed by the individuals in our sample. However, differences, even minor ones, can usually be found between jobs in the same or different organizations/offices. While the Standard tests are valid representations of the job elements performed by the SMEs in our sample, we cannot confidently state that they are a valid representation of the tasks in all jobs. Before claiming that the test is a valid representation of a given job, an employer should ensure that the job elements measured by the test are substantially the same as the elements of the job for which an applicant is being selected.

Validity And Use Of The SkillCheck Tests

Many SkillCheck customers inquire about how they can integrate the SkillCheck test into their organization's selection process. To answer this question, this section describes the issues that a HR professional would consider in using the test. Specifically, this section outlines:

- *The factors that an employment professional would consider before using the test.*
- *Test validity, the major approaches to validation, and legal challenges to testing.*
- *The steps that SkillCheck took to ensure the validity of the Standard tests.*
- *How the Standard tests might be integrated into your pre-employment testing procedure.*
- *Use of custom tests, as developed with the SkillCheck test-making products.*
- *Resources that you can turn to for further assistance.*

Considerations In Choosing A Pre-Employment Test

When choosing an employee-selection testing procedure, an employer should consider three aspects of the test's use: the validity of the testing process, the possibility of legal challenges and adverse impact, and the cost of testing. As will be indicated shortly, if a test is valid, it can withstand legal challenges and it will be cost effective. Thus validity is the most critical concern in considering these three aspects of test use. It is important to note that a test itself cannot be considered valid or invalid; rather it is the use of a test in a specific context that should be considered for purposes of validation. SkillCheck has taken steps to demonstrate the validity of its Standard tests, but ultimately employers must determine whether the validity studies described below are a useful demonstration of validity for their purposes.

Definition of Validity

Validity is the appropriateness, meaningfulness and usefulness of the inferences made from test scores, and validation is the process of accumulating evidence to support such inferences. Validity in an employee-selection context refers to the ability of a test to select individuals to perform a specific job. Pre-employment selection testing is the primary focus of most test validations. A pre-employment test is not valid in and of itself; rather a testing process is valid in the context of a specific job. Valid testing allows one to select the best employees, which has a direct impact on profitability. Research has consistently shown that the dollar value of an increase in test validity is many times larger than the cost of even the most expensive tests. Thus, any possible increase in cost associated with a more valid test would be small in comparison to the revenue saved or gained by pretesting employee proficiency.

Approaches to Demonstrating Validity

Many methods, and combination of methods, can be used to demonstrate validity. We have used a combination of methods to validate the SkillCheck test. Below, we will discuss the various validation methods in terms of three strategies: content-oriented validation, criterion-oriented validation, and construct-oriented validation.

Content-Oriented Validation. A test is content valid when it is a representative sample of the content of the job for which applicants are being selected. That is, a test is said to be content valid if it is known to measure the knowledge and skills required for a job or if it is known to simulate the tasks that make up a job. Typically, a content-oriented validation study will begin with a "job-analysis" to identify the tasks that make up a job as well as the knowledge and skills required for a job. Then, on the basis of this job analysis, the test developer will design the test so that the test items match the various parts (knowledge/skills or tasks) of the job. Often, critical knowledge/skills and tasks are represented by more items than those that are less critical.

Criterion-oriented Validation. Criterion-oriented validation consists of demonstrating that there is a useful relationship between test scores and one or more measures of job-relevant performance (criterion). That is, a criterion-valid test is able to predict employee performance on some criterion, and the criterion must be relevant to performance on the job. Typical criteria include measures of job performance, training performance, etc.

To validate a test using a criterion-oriented approach, one might first administer the test to a group of job applicants, then randomly select employees from these applicants, and finally (without considering test performance) review the new-hire's performance on the job. The test is valid if the new-hire's job performance could have been predicted by the pre-employment test. The relationship between test scores and performance is usually summarized as a statistical correlation; a significant correlation is demonstration of validity. Many variants of criterion-oriented approaches to validation exist. For example, if the test is given to current employees and the test's results are found to be correlated with employee's current job performance, the test can be considered valid. This latter approach is referred to as "concurrent validation" because the employees are tested at the same time as their performance is measured.

Construct-oriented Validation. Construct validation is a demonstration that the test measures the human characteristic (or construct) that it is designed to measure. If the test measures a well-defined construct (and only one construct), it is said to be construct valid.

To demonstrate the construct validity of a test, one must first theoretically define the characteristic (construct) that the test measures. This definition should include a list of measures to which the test should relate as well as measures to which it should not relate. Then, one must conduct a series of studies to determine that the test does indeed relate (or does not relate) to the appropriate measures. No single study can demonstrate the

construct validity of a testing procedure. Construct validation is not typically used for demonstrating that a test is a meaningful and useful predictor of performance for a specific employment context. Rather, construct validation is typically used to demonstrate that a psychological test measures the construct that it is designed to test (for example a test of intelligence must be related to other tests of intelligence, and must not be related to personality).

Often the differences among the three approaches (content, criterion, and construct) are arbitrary and indistinct, and the three approaches to validation can be combined. None of the three strategies are perfect, and all must be implemented according to professional standards with an eye towards federal and local case law and statutes. To validate the SkillCheck line of products, we relied largely upon content- and criterion-oriented validation strategies. Before describing the process followed to validate the SkillCheck tests, we will briefly review the interplay between test validity and legal challenges as well as adverse impact.

Legal Challenges, Adverse Impact, and Validity

A testing procedure is not likely to be legally challenged unless it is used to make personnel decisions (e.g., select/not select, promote/not promote, retain/lay-off, etc.).[1] If a test is legally challenged, test validity becomes even more critical to the employer. Since most employment tests are used for personnel decisions, it is worth discussing the cause, conditions, and typical process of legal challenges in this description of test validation. However, before describing the role of test-validity in legal challenges, we must first discuss the concept of adverse impact.

Nearly all legal challenges to testing revolve around arguments of discrimination against specific minority groups. When a testing procedure screens out a disproportionate number of individuals of a specific race, color, religion, sex, national origin, age, or physical disability, it is said to adversely impact minorities. Adverse impact is a necessary condition for legal challenges of discrimination. In other words, if there is no evidence of adverse impact, state and federal agencies will not pursue claims of discrimination.

Most people agree that an individual should achieve a score on a pre-employment test that represents their ability to do the job. An individual should not be screened out of a job on the basis of their membership in a particular minority group. Sometimes, however, individuals from a group do, on average, score lower than the average score for another group. In such cases, it can be difficult to know whether there is something

[1] Tests are not always used for personnel decisions. One might use a SkillCheck test to investigate whether or not a training program caused employees to use a software program more effectively. In such a situation, one might not even record individuals' scores, because one is really evaluating the training program (not the employees). In this situation, the decisions made on the basis of the test would not affect a specific individual, and thus legal challenges would be extremely unlikely.

wrong with the test or whether individuals in the group have not had the level of experience necessary to perform well on the job. For example, a test may tend to screen out foreign-born job applicants because, as a group, they have less experience or skill in the areas covered by the test. Alternatively, the test might tend to screen out foreign-born applicants because of factors unrelated to job performance (i.e., their inability to read the instructions in written English where the ability to read English is not a job requirement). Regardless of the cause, if testing does screen out minorities at a rate that is meaningfully greater than that of the majority group, the test is said to have adverse impact.

Just as test validity only makes sense in the context of a specific job, so too adverse impact can only be found in the context of a specific job. A test may adversely impact minorities in one situation and not another situation. One might expect differences in the average skill level of certain groups, but this does not mean that a test of this skill will adversely impact the specific group being tested. For example, male applicants may, as a group, perform poorly on tests of typing skills. Then again, fewer, but more highly skilled men might apply for a specific typist position. Thus, an employer might have a test that would tend to screen out males from the general population. However, in the specific testing situation described, the employer's test would not adversely impact men. Unfortunately, adverse impact can happen unintentionally and unexpectedly, so an employment professional must continually monitor test use for adverse impact.

Adverse impact is an adequate justification for legally challenging a selection procedure. If it can be demonstrated that a selection process disproportionally screens out minorities, the employer must demonstrate the test's validity for the job. If the test is valid for a job, then there is a business rationale for use of the test and the employer may continue to use the testing procedure despite the adverse impact. In other situations, when an alternative selection device has a demonstrably equal or higher level of validity than the device currently being used, an employer may be legally mandated to use the alternative selection device.

An HR professional may ask "Do I need to conduct my own validation in case of legal challenges?" While there is no cut-and-dried answer to this question, validation results from a different job or organization may be used if the jobs (i.e., the current job and the job for which the original validation was conducted) are "substantially" the same. The similarity of the jobs can be investigated by conducting a job analysis in one's organization and comparing the job's structure to the job for which the original validation was conducted. Obviously, one must eventually make a judgment of whether the jobs are "substantially" the same, and no guidelines have been presented by the courts or by the federal government to assist in this judgment. Such a judgment would need to consider the general milieu of employee/labor/racial relations, as well as likelihood of adverse impact and legal challenges. The extent to which validation studies can be "transported" between jobs is currently being debated by testing professionals and, while there is not clear consensus, it appears that the trend is towards increasing transportability. Although, this trend is likely to be reflected in future court cases, at present there are no clear

guidelines for identifying whether or not each organization must conduct its own independent validation study for each specific job.

Validation of the SkillCheck Product Line

The SkillCheck Professional and SkillCheck Professional Plus products include Standard tests which have been demonstrated to be valid (i.e., appropriate and meaningful) simulations of the tasks that our sample of clerical employees generally complete while using software applications. This statement of validity is based upon a series of validation studies. The rationale and process underlying this statement of validity is given below.

In validating the SkillCheck line of products, we have demonstrated that the Standard tests are appropriate and meaningful simulations of the "job element" associated with the use of the software application. Any given job is comprised of several job elements. For example, a temporary clerical employee hired to do word processing must perform additional job elements, such as following directions (one must produce documents to certain specifications), prioritizing tasks (one must manage to complete several projects or tasks on schedule), and using a micro-computer environment (e.g., Windows 95). Selection procedures are often designed to select individuals to perform all of the duties that comprise a job, and validation is a demonstration that the test or selection system is a meaningful predictor of overall job performance. In the case of SkillCheck Standard tests, we have validated only the specific job element that each test is designed to measure. For example, SkillCheck's Word For Windows Standard test has been demonstrated to be a valid simulation of the "Use of Word for Windows" job element. It is incumbent upon an employer to identify and test the additional elements that comprise a job. Below, we describe the methods used to validate the SkillCheck tests.

Content-Validation of the SkillCheck Tests. The SkillCheck products are samples of tasks involved in the use of the various software applications (e.g., Use of Microsoft Word for Windows). Since each question in a SkillCheck Standard test is a simulation of the actual tasks that comprise the process involved in working with the application, every test item represents a job-task. Additionally, each Standard tests has been constructed in such a way as to ensure that the mix of test items matches the actual tasks performed on the job (i.e., the Standard test samples a variety of the most critical and frequent tasks in the job element).

Content validation is really a description of the process used in constructing the SkillCheck Standard tests. The process that we followed to develop the content-valid simulation is as follows: First, we identified the task-clusters as well as the criticality and frequency of the task-clusters that are part of the job element. Then, with the assistance of subject matter experts, we identified the task clusters that each test-item represents. Finally, we ensured that the mix of items in the Standard test represents the criticality and

frequency of the tasks to the job. The technical details followed in the process of content validation are available from your SkillCheck representative.

Criterion-Oriented Validation. In the next few months, we will validate SkillCheck's tests using a concurrent strategy. We will demonstrate that each test is related to performance in pre-employment training. Specifically, halfway through such training, we will administer the test to trainees. While the test is being administered, the trainer will rate the individual's performance (i.e., job-readiness and performance relative to other program-participants). Additionally, later in the training program, a skill-simulation will be given to program participants. Both sets of scores, the current performance rating and the post-training skill-simulation, will be used to assess the relationship between test performance and performance in training.

Construct Oriented Validation. Because the SkillCheck tests are simulations of job tasks, not measures of a human construct, we have not attempted to demonstrate construct validity. SkillCheck products are life-like simulations and thus represent the same constructs as required for the job. Though each test likely measures several employee characteristics or constructs, we see no utility in identifying and attempting to measure all of the constructs that the simulation represents. For example, one might propose that the SkillCheck tests are, among other things, related to keyboard skills. However, we did not test such a proposal. Regardless of the skills required, if an individual can perform the tasks that are part of the SkillCheck test, they can perform the tasks that make up the job element.

Integrating the SkillCheck Product Into Your Current Selection Procedures

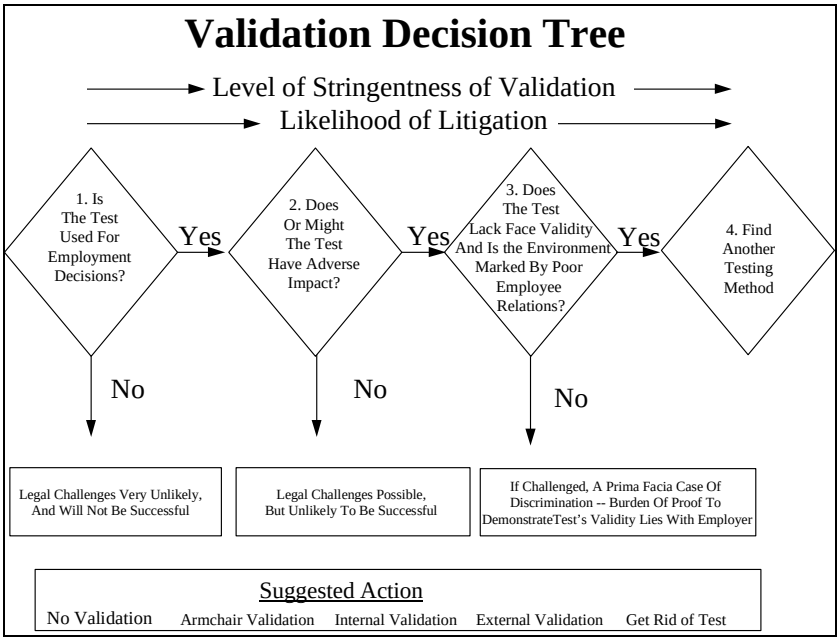
Our research indicates that the SkillCheck Standard tests are representative samples of the task-clusters in the jobs performed by our sample of SMEs. Common sense suggests that the great majority of clerical software end-users will perform a mix of tasks that are similar to the tasks performed by the individuals in our sample. Thus, it is likely that the test will be a valid predictor of job performance in many situations. However, without additional information, we cannot state that the Standard tests will be valid for all specific purposes. The job performed by our subject-matter experts (SMEs) may differ from that in another situation. Because of this possibility, an HR professional should determine whether the task-clusters represented in the Standard test are indeed the same as the task-clusters in the job-element for which he or she is selecting employees. If the job elements are substantially the same, one can use the Standard test. If the job elements are different, one can develop a custom test using the SkillCheck Software TestMaker. These two options are described in more detail below.

Validation Issues In The Use of Standard test. A validation study investigates the usefulness of a test for a specific job. SkillCheck Standard tests have been demonstrated to be valid because they simulate the job-elements that the clerical employees in our

sample perform when using various software applications. In general, research suggests that a test that is valid for one job can be valid for other jobs. Thus, the Standard tests are likely to be a meaningful and useful predictor in your context. However, differences, even minor ones, can usually be found between jobs in different organizations and offices. While the Standard tests are valid representations of the job elements performed by the SMEs in our sample, we cannot confidently state that they are a valid representation of the tasks in all jobs. Before claiming that the test is a valid representation of a given job, an employer should ensure that the job elements that were used to develop the test are substantially the same as the elements of the jobs for which applicants are being selected. That is, if challenged in court, employers must be able to demonstrate that the test is valid in the context of their organization. Because the SkillCheck test is a valid sample of the tasks performed by the SMEs in our focus group, an employer must only demonstrate that the job element that his or her employees perform is substantially the same as the job element performed by our SMEs.

The level of detail and defensibility of a validation should vary according to the audience of the validation report and the context of test use (see Figure 1, the Validation Decision Tree). If the test is not being used for personnel decisions, validation is probably not critical. However, if one expects that the test is likely to have adverse impact or if the general organizational context is marked by poor employee relations, you may need a more rigorous validation. If one expects that use of the test will result in adverse impact and legal challenge, it is probably best to conduct your own validation of the test with a qualified consultant. However, if one is confident that the test is a simulation of the tasks required by new employees and one does not expect legal challenges, this validation report should be adequate.

Figure 1: Validation Decision Tree



Resources For More Information On Test Validation

Test validation can be quite complex and technical. While the resources listed below can provide some background information on pre-employment testing and validation, there is no substitute for professional training and experience in test validation. If you anticipate any legal difficulties related to the use of your tests, please contact your SkillCheck representative. The resources listed below will provide further information:

American Educational Research Association, American Psychological Association, and National Council on Measurement in Education. (1985). Standards for educational and psychological testing. Washington, DC: American Psychological Association.

Diane Arthur (1994). Workplace Testing: An employers guide to policies and practices. New York: AMACOM.

Robert Gatewood (1990). Human Resource Selection (Second Edition). Chicago: The Dryden Press.

Society for Industrial and Organizational Psychology, Inc. (1987). Principles for the Validation and Use of Personnel Selection Procedures. (Third Edition). College Park, MD.

Validation of SkillCheck's *Word '97 - Standard test*

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February 1999

Validation of SkillCheck's *Word '97 - Standard test*

Introduction

SkillCheck's *Word '97 – Standard test* is comprised of a representative sample of typically used aspects of Microsoft's Word '97 word processor. Previous validation efforts included the content validation of the instrument, and utilized subject matter experts' evaluations of item layout and composition. The content validation process involved identification of primary task clusters associated with the application, appraisal of criticality and frequency of each task cluster, relating test items to clusters and final selection of items. The current validation process is criterion validation, and is concerned with relating test performance to work performance.

Just as Word '97 is designed for application within several broad contexts, the purpose of the *Standard test* (ST) is to effectively evaluate the knowledge and skills required for operation of Word '97 within those contexts. The primary users of the ST will be organizations and individuals that are interested in isolating a particular facet of job performance and evaluating it carefully. Temporary employment agencies, for example, will find the application useful as such agencies have a particular need for effective skill evaluation when matching individuals with assignments. As the test items are highly descriptive and generalizable to work behaviors, competent assessment of Word '97 skills will help ensure a good person-assignment 'fit.'

There were several steps involved in validating the *Word '97 – Standard test*. First, data was collected from a wide range of temporary employees. Subjects with varying levels of skill from several temporary firms were assessed to promote reliability and generalizability. While the ST was completed, the subjects' performance was evaluated on overall performance. These three performance factors were compiled to form a single criterion performance score. Using this performance score, the ST scores were evaluated in terms of validity and reliability. Additionally, performance scores were compared to demographic information to ensure a lack of adverse impact.

The technical details of the validation are described below.

Methods

Participants

Twenty-three subjects from several Boston-area temporary employment agencies completed the *Word '97 – Standard test*. The composition of the subjects is detailed below.

	Race					Gender	
	White	*African American*	*Asian American*	*Hispanic/ Latino*	*Other*	*Male*	*Female*
Frequency	22		1			11	12
Percentage of Sample	95.7 %		4.3%			47.2%	52.2%

	Age						Education			
	10-19	*20-29*	*30-39*	*40-49*	*50-59*	*59+*	*High School*	*2 yr. College*	*4 yr. College*	*Graduate School*
Frequency	5	10	4	3	1		2	3	13	5
Percentage of Sample	21.7%	43.5%	17.4%	13.0%	4.3%		8.7%	13.0%	56.5%	21.7%

Process

Data for validation was collected across three months. Temporary employees were contracted for one full day to complete testing at SkillCheck. Afterwards, representatives of the temporary agency answered a survey describing subjects' demographics and job performance related to Word '97.

Data Analysis/Variables

The *Word '97 – Standard test* is a computerized application comprised of seven primary topics (File Management, Editing, Formatting, Desktop Publishing, Customizing Word, Printing, Online Use/Internet). Within the program, subjects are instructed to perform certain actions with the Word '97 using an accurate simulation of the Microsoft Word application; correct implementation of the instructions is rewarded by an increase in total score. Eventually, the subject finishes and is rewarded with a total score, topic and level scores.

To gather the performance information for the criterion validation, a placement agency representative completed a questionnaire recording the subjects' race, gender, age, level of education, ST score and on-the-job performance. The overall job performance variable was calculated by taking a composite of three additional variables:

- Skill relative to other employees
- Proficiency in operating Word ’97
- Level of comfort with subject’s on-the-job performance

Inclusion of these variables was necessary in predicting performance, confirming reliability and ensuring against racial, age or gender-based bias.

Analysis/Results

Reliability

Reliability, or overall consistency, is one of the central factors when validating instruments; that is, in order for a test to be valid, it must be consistent. There are several popular indices of reliability, two of which were employed in this validation effort. First, the most widely used reliability index, Chronbach's alpha, was used to describe how well each item relates to every other item in the scale. Second, a split-half reliability analysis was also performed to compare subsets of items. Reliability statistics are reported on a scale of 0.00 – 1.00; the commonly accepted level of reliability is .7.

Reliability Test Used	**Reliability Score for *Word '97 – Standard test***
Chronbach's Alpha	.7397
Split-Half (adjusted)	.7928

Correlations

A correlation represents the strength of the relationship between two variables. A correlational score is represented by an index that ranges from –1.00 to +1.00. The further the correlation is from 0, the stronger the relationship is between the variables. That is, a correlation of .85 is equal *in magnitude* to a correlation of -.85. The positive or negative sign merely indicates the *direction* of the relationship. For example, a positive correlation might exist between I.Q. and high school grade point average, while a negative correlation might exist between amount of alcohol consumed and driving ability. In other words, the magnitude (strength) of two relationships may be equally strong in both situations while the directions are opposite.

In test validation, correlational analyses have many uses. First and foremost, correlations are used to explore data and support any existing hypotheses. Second, correlational analyses help determine if test performance is a function of racial or gender bias. Finally, researchers are typically interested in the relationship between test scores (in this case, the *Word '97 – Standard test*) and performance measures (in this case, the composite measure) to demonstrate test validity for legal purposes. The primary correlations for this study are contained below.

	Race	Age	Gender	Job Performance	Test Score
Race					
Age	-.068 p = .757				
Gender	-.223 p = .307	.306 p = .155			
Job Performance	.158 p = .493	.004 p = .985	.219 p = .085		
Test Score	.133 p = .546	.175 p = .424	.004 p = .986	**.619** **p = .003**	

In the matrix, you will note that there are two values. The top value is the correlational coefficient. The second is the p-value. The p-value is the possibility that the results that you have found are wrong or untrustworthy. For example, a p-value of .22 indicates a 22% chance of untrustworthy results. Traditionally, a correlation is considered significant (and therefore worth trusting) if the p-value is less than .05, or 5%. In the table above, any correlation with a p of less than .05 has been bolded.

ANOVA

ANOVA stands for Analysis of Variance, and is a statistical process used to test differences among means. In essence, an ANOVA compares group means to determine if there are significant differences. Although ANOVAs can be used for computations of greater complexity, for the purpose of this analysis this definition will stand. ANOVA calculations result in F-scores and significance scores. F-scores represent scores on a normalized distribution; significance scores function just as in the correlations discussed previously.

One of the more traditional uses of ANOVA in test validation is determining whether significant differences exist between legally protected groups (i.e. women, minorities, individuals with disabilities) and non-protected groups. If there were, for example, significant differences between the means of women and men that completed the ST, then the test could be construed of as possessing *adverse impact*, or some level of non-intentional, systemic discrimination within the instrument itself.

The ANOVA analyses for the ST are detailed below.

Variable	***F-Score***	***Significance***
Age	.943	.462
Gender	.377	.546
Education	.000	.986
Race**	1.826	.181

** The test group was not diverse enough to make a conclusive evaluation whether there are significant differences across race.

Summary and Conclusions

The SkillCheck *Word '97 – Standard test* has been developed to effectively assess individual skill with Word '97 and predict the effectiveness of employees with specific job functions. The ST evaluates the knowledge and ability of test takers around specific Word '97 functions and overall performance on Word '97. The test has been developed not only to be useful in assessing employees' skill on Word '97, but also in assessing general performance and competence. We feel confident making this generalization due to the process and output-oriented nature of the work performed by clerical workers and temporary employees.

The most critical statistic in the validation of the ST is the correlation between the ST test score and performance. This strong, significant correlation (.619, $\underline{p}$ = .003; see Figure 1) indicates that the ST is an effective predictor of performance by temporary employees. As the performance criterion was formed from a wide variety of work-related factors (performance, relative skill, and comfort with individual), the strength of this relationship advocates **for** the use of the ST within temporary agencies. Moreover, the ST demonstrated high reliability as well (.7928), suggesting that the test consistently evaluate employees' skill sets with accuracy.

To ensure that the ST does not possess adverse impact, several analyses were performed to evaluate the relationships between the ST scores and race, gender or age. Correlation, regression, and ANOVA analyses all indicated absence of group mean differences on the *Word '97 – Standard test.* Interestingly, the only significant effect in terms of race, gender or age was that temporary agencies seem to have a higher comfort level in offering women temporary assignments. This had no effect on the validity of the ST. It is worth noting, however, that there was not a significant representation of minorities taking the test. Although it is unlikely that the ST contains items demonstrating adverse impact, further data collection and evaluation is recommended.

In conclusion, the *Word '97 – Standard test* is a reliable, accurate, valid method of determining employee or applicant skill with Word '97. Also, it seems to operate free of gender or racial bias – a significant legal necessity. As many temporary employees are hired to perform highly content-specific tasks (and operate without the excess baggage of roles or group membership), the ST is an excellent predictor of temporary employee performance and Word '97 skill. Used either alone or in combination with other selection measures, the *Word '97 – Standard test* promises to be one of the most effective skill-based selection measures on the market.

Word '97 Standard test Introduction

The Standard test for SkillCheck Professional and Professional Plus for Microsoft Word 97 simulate all of the essential features and functions of the software in order to provide fully interactive, performance-based assessment of basic, intermediate and advanced skills with Word 97. Questions cover major areas of Word 97 use and are answered by performing complete tasks in any correct way the actual software allows (see Word 97 Tasks below).

Default test settings allow examinees to have two tries per question, receive feedback after each answer indicating whether it is correct or not, and review and revise their answers after they have completed the test. Test score reports can be displayed, printed and/or saved for retrieval and analysis.

Test Specification

Questions in the SkillCheck Standard test for Word 97 are divided into the following "Topics" or domains of application knowledge:

Word 97 Topics or Domains	Number of Questions	Tasks in this topic or domain included in the SkillCheck Standard test
File Management	5	Create letter, open document, save document, create document, display comments on versions of documents.
Editing	6	Copy text, insert text, redo command, find word, go to page, spellcheck.
Formatting	12	Set margins, choose landscape orientation, display header, choose paper size, change line spacing, set tab, change font, change bullets, draw table, center page numbers, create new style, footnote reference
Desktop Publishing	4	Insert picture, page border, drawing, border lines.
Customizing Word	2	Display ruler, record macro.
Printing	5	Print preview, print document, create merge form, merge field, specify printer
Online/Internet Use	1	Display Web toolbar.

Questions in the SkillCheck Standard test for Word 97 are also divided into three skill levels with the following distribution:

Word 97 Test	Basic	Intermediate	Advanced
# of questions	14	8	13

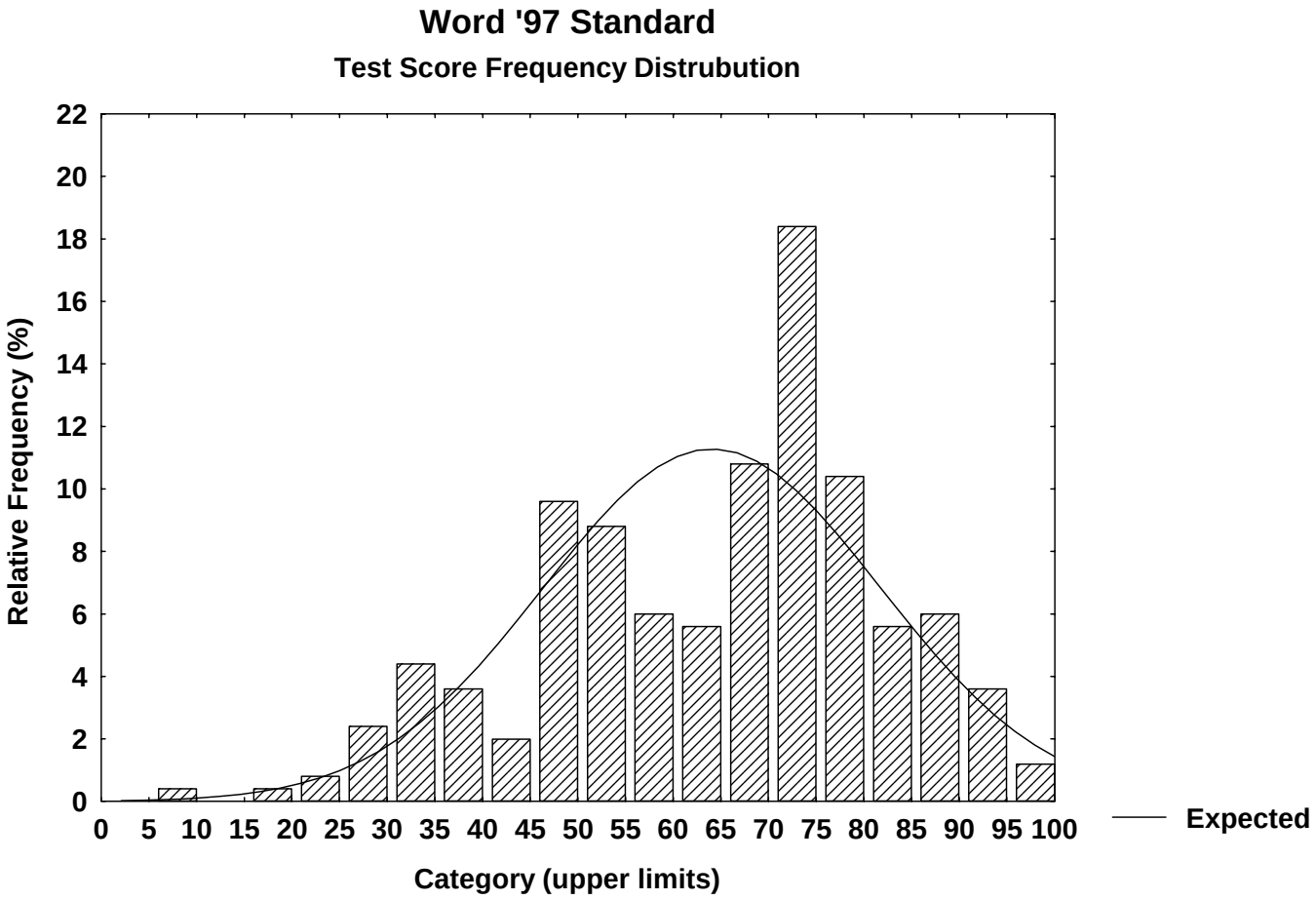
The SkillCheck technical manual provides full information on the SkillCheck testing and administration system, including information on test configuration and reporting.

Research Method

June 1999 the Donath Group

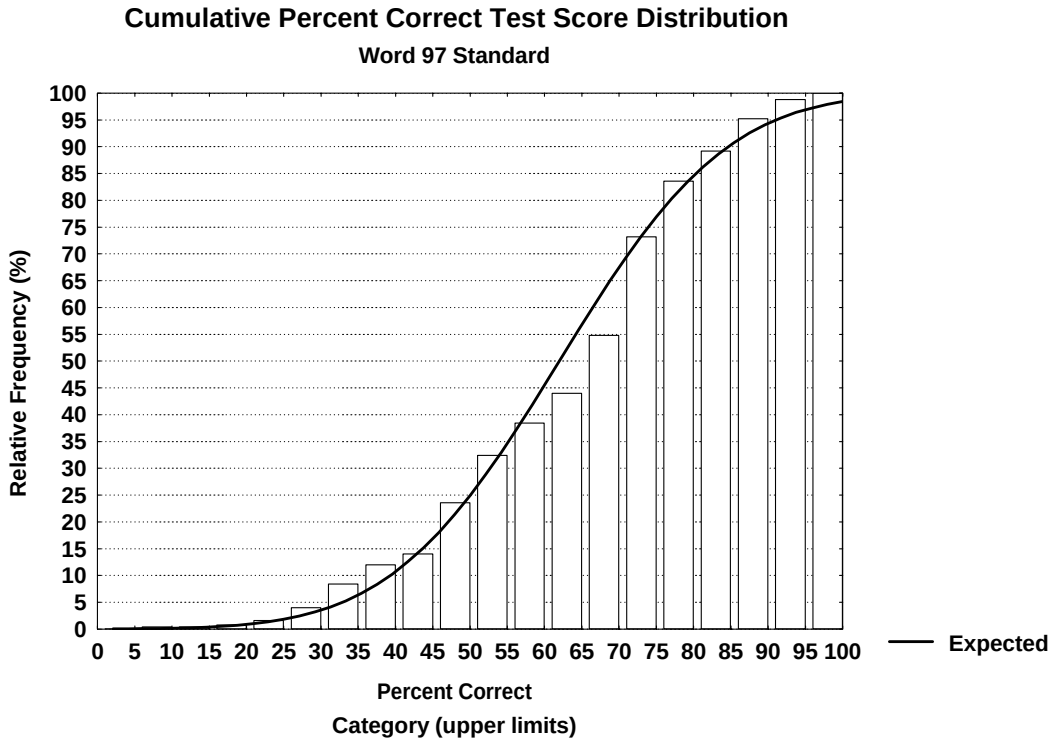
SkillCheck obtained representative samples of test performance from 10 client organizations that deliver the test for the purpose of selecting job candidates for placement. These tests were delivered under standard conditions. The test performance data was cleaned to eliminate practice tests, multiple administrations to the same individuals.

The graph below depicts Word 97 Standard test performance in a frequency distribution of test scores. This data was obtained from a representative sample of test takers.



Descriptive Statistics							
Percent Correct	Valid N	Mean	Confid. -95.0%	Confid. +95.0%	Median	Std.Dev	Standard Error
Test Score	250	64.05	61.84	66.25	67.50	17.69	1.12

Test Score Frequency	Valid N	Relative Percent
0.0 < x <= 20.0	2	0.8
20.0 < x <= 40.0	28	11.2
40.0< x <= 60.0	66	26.4
60.0< x <= 80.0	113	45.2
80.0 < x <= 100.0	41	16.4
Total	250	100%



Appendix C - Test Statistical Analysis

The percentile ranks of percent correct test scores were calculated using a linear interpolation method. Therefore, this information is a guide and should not be considered an exact number percent correct relationship to the percentile rank.

Percentile Rank	Percent Test Score
99th	100
95th	90
90th	85
85th	83
80th	80
75th	76
70th	74
65th	73
60th	71
55th	70
50th	68
45th	65
40th	63
35th	58
30th	54
25th	51
20th	48
15th	46
10th	38
5th	32

Appendix C - Test Statistical Analysis

Internal Consistency Reliability Coefficient (KR-20): .87
Standard Error of Measurement: 6.38
Average inter-item correlation: .16

Test Item Statistics

Question	Valid N	P-value	Point-biserial correlation
Q002	250	0.60	0.37
Q003	248	0.99	0.16
Q005	248	0.87	0.29
Q010	250	0.62	0.51
Q011	248	0.67	0.56
Q012	248	0.48	0.43
Q013	245	0.96	0.32
Q016	243	0.91	0.24
Q018	242	0.86	0.32
Q021	250	0.81	0.26
Q023	250	0.96	0.21
Q024	250	0.95	0.31
Q029	250	0.77	0.54
Q031	250	0.68	0.54
Q038	250	0.86	0.35
Q040	250	0.71	0.50
Q044	250	0.60	0.27
Q049	241	0.29	0.27
Q053	250	0.52	0.42
Q055	250	0.98	0.27
Q058	248	0.67	0.40
Q060	250	0.49	0.39
Q062	243	0.37	0.40
Q066	250	0.78	0.41
Q068	249	0.44	0.52
Q070	247	0.93	0.24
Q075	249	0.45	0.53
Q077	246	0.27	0.41
Q081	248	0.65	0.59
Q098	248	0.19	0.35
Q106	250	0.28	0.28
Q107	248	0.35	0.25
Q108	250	0.65	0.34
Q109	241	0.07	0.17
Q110	247	0.86	0.44

Excel '97 Standard test Introduction

The Standard test for SkillCheck Professional and Professional Plus for Microsoft Excel 97 simulate all of the essential features and functions of the software in order to provide fully interactive, performance-based assessment of basic, intermediate and advanced skills with Excel 97. Questions cover major areas of Excel 97 use (see Excel 97 Topics below) and are answered by performing complete tasks in any correct way the actual software allows (see Excel 97 Tasks below).

Default test settings allow examinees to have two tries per question, receive feedback after each answer indicating whether it is correct or not, and review and revise their answers after they have completed the test. Test score reports can be displayed, printed and/or saved for retrieval and analysis.

Test Specification

Questions in the SkillCheck Standard test for Excel 97 are divided into the following "Topics" or domains of application knowledge:

Excel 97 Topics or Domains	Number of Questions	Tasks in this topic or domain included in the SkillCheck Standard test
File Management	2	Create workbook, save workbooks.
Editing	7	Go to, delete cells, paste special, replace word, undo command, insert new row, spellcheck.
Formatting	9	Autofit column width, format cells as currency, boldface text, center text, create top border, change chart type, bring-to- front, change font, rotate counterclockwise.
Analysis	7	Create chart, sort data, type formula, insert sum functions, round off numbers, display serial date/time number, add map symbols.
Customizing Excel	4	Protect cells, name cell range, record macro, customize menu.
Printing	4	Scale worksheet, print preview, print copies of worksheet pages, print preview page breaks.
Online/Internet Use	2	Display Web toolbar, insert hyperlink.

Questions in the SkillCheck Standard test for Excel 97 are also divided into three skill levels with the following distribution:

Excel 97 Test	Basic	Intermediate	Advanced
# questions	10	10	15

The SkillCheck technical manual provides full information on the SkillCheck testing and administration system, including information on test configuration and reporting.

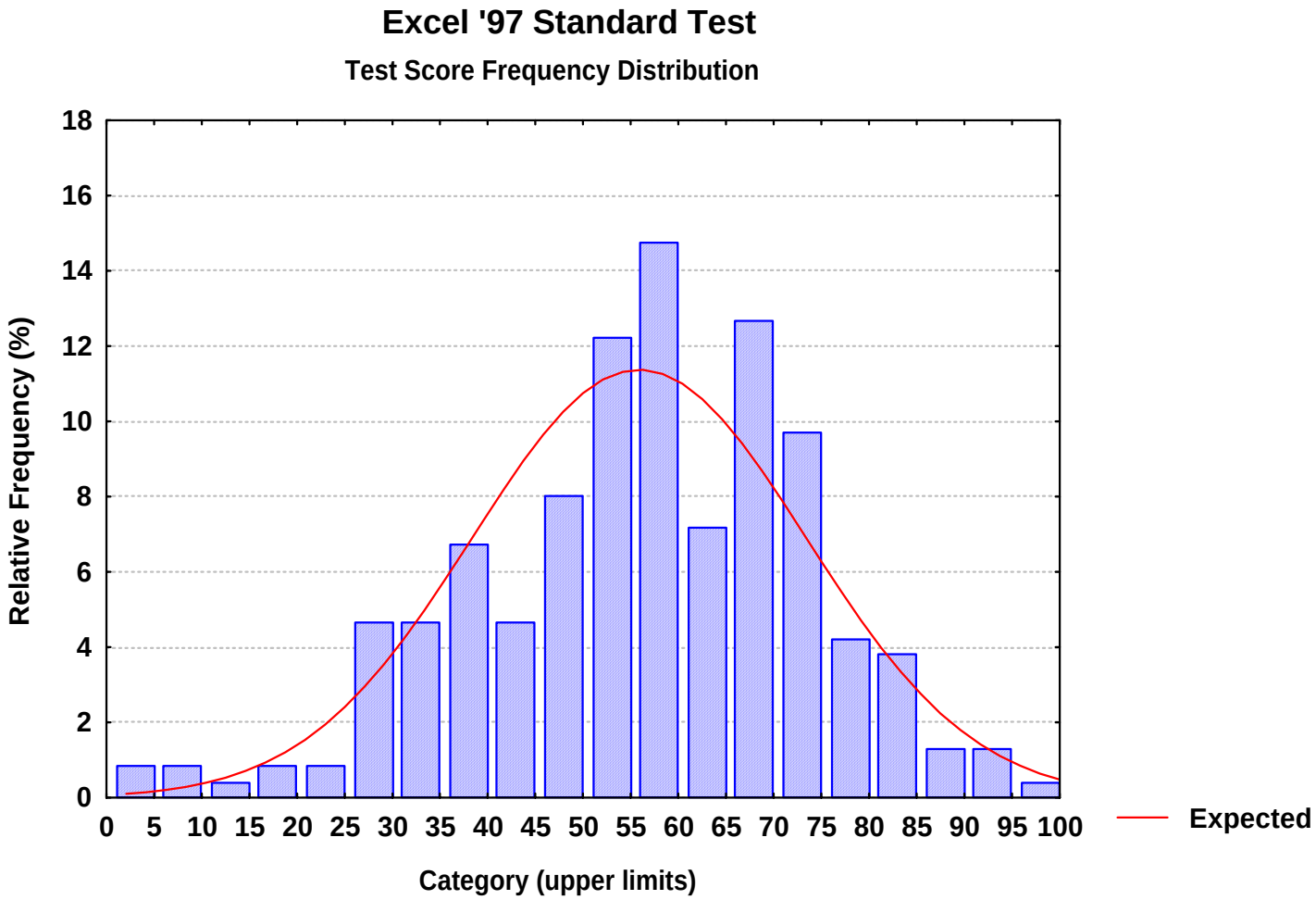
Research Method

June 1999 The Donath Group

SkillCheck obtained representative samples of test performance from 10 client organizations that deliver the test for the purpose of selecting job candidates for placement. These tests were delivered under standard conditions. The test performance data was cleaned to eliminate practice tests, multiple administrations to the same individuals.

Test Performance

The graph below depicts Excel 97 Standard test performance in a frequency distribution of test scores. This data was obtained from a representative sample of test takers.

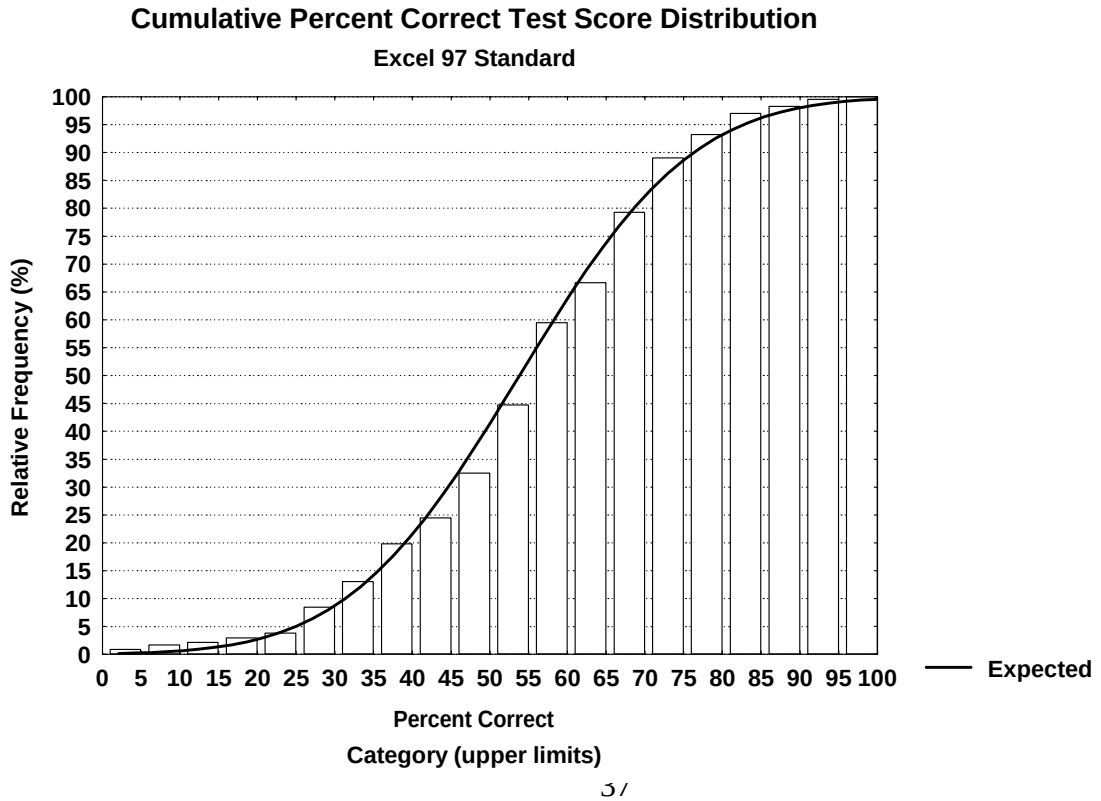


Appendix C - Test Statistical Analysis

Descriptive Statistics

	Valid N	Mean	Confid. -95%	Confid. +95%	Median	Std.Dev.	Standard Error
Percent Correct	199	55.85	53.37	58.34	57.00	17.81	1.26

Test Score Frequency	Valid N	Percent
0.00< x <= 10.0	4	1.69
10.0< x <= 20.0	3	1.27
20.0 < x <= 30.0	13	5.49
30.0< x <= 40.0	27	11.39
40.0 < x <= 50.0	30	12.66
50.0 < x <= 60.0	64	27.00
60.0< x <= 70.0	47	19.83
70.0 < x <= 80.0	33	13.92
80.0 < x <= 90.0	12	5.06
90.0 < x <= 100.	4	1.69



Appendix C - Test Statistical Analysis

The percentile ranks of percent correct test scores were calculated using a linear interpolation method. Therefore, this information is a guide and should not be considered an exact number percent correct relationship to the percentile rank.

Percentile Rank	Score
100th	100
95th	85
90th	80
85th	75
80th	75
75th	70
70th	69
65th	65
60th	62
55th	59
50th	58
45th	55
40th	54
35th	52
30th	49
25th	47
20th	44
15th	38
10th	34
5th	28

Internal Consistency Reliability Coefficient (KR-20): .87
Standard Error of Measurement: 6.42
Average inter-item correlation: .17

Test Item Question	Point-Biserial Correlation	Valid N	P-Value
Q004	0.19	237	0.86
Q008	0.29	236	0.35
Q009	0.44	236	0.96
Q010	0.42	235	0.72
Q012	0.32	237	0.28
Q014	0.38	237	0.97
Q016	0.35	237	0.82
Q019	0.35	222	0.23
Q022	0.38	237	0.42
Q028	0.51	237	0.65
Q029	0.46	222	0.41
Q035	0.46	237	0.89
Q037	0.35	237	0.18
Q039	0.40	222	0.35
Q040	0.42	237	0.27
Q044	0.50	237	0.80
Q049	0.45	235	0.93
Q050	0.38	237	0.96
Q053	0.50	222	0.58
Q055	0.30	237	0.28
Q057	0.36	237	0.74
Q061	0.32	222	0.18
Q063	0.36	222	0.96
Q066	0.23	222	0.23
Q067	0.37	237	0.75
Q072	0.16	220	0.33
Q075	0.53	237	0.70
Q077	0.50	237	0.67
Q095	0.45	237	0.62
Q102	0.35	237	0.14
Q112	0.44	216	0.34
Q113	0.39	231	0.72
Q114	0.39	231	0.74
Q115	0.40	231	0.47

PowerPoint '97 Standard test - Introduction

The Standard test for SkillCheck Professional and Professional Plus for Microsoft PowerPoint 97 simulate all of the essential features and functions of the software in order to provide fully interactive, performance-based assessment of basic, intermediate and advanced skills with PowerPoint 97. Questions cover major areas of PowerPoint 97 use (see PowerPoint 97 Topics below) and are answered by performing complete tasks in any correct way the actual software allows (see PowerPoint 97 Tasks below).

Default test settings allow examinees to have two tries per question, receive feedback after each answer indicating whether it is correct or not, and review and revise their answers after they have completed the test. Test score reports can be displayed, printed and/or saved for retrieval and analysis.

Test Specification

Questions in the SkillCheck Standard test for PowerPoint 97 are divided into the following "Topics" or domains of application knowledge:

PowerPoint 97 Topics or Domains	**Number of Questions**	**Tasks in this topic or domain included in the SkillCheck Standard test**
File Management	4	Create new presentation, open presentation, save presentation, pack and go..
Editing	6	Select all items, delete object, undo command, replace word, delete slide, spellcheck.
Slide Formatting	5	Create new slide, select slide view to edit items, insert Word table, display slide miniature, omit slide background items
Outlines	3	Demote selected item, collapse outline to show slide titles only, show outline text without formatting.
Text and Graphics	7	Change font, center text, insert picture, format arrow line, remove shading, change bullet size, group selected graphics.
Sorter/Slide Show	4	Choose Slide Sorter View, select "Wipe Right" effect, rehearse/time presentation, view presentation on two screens.
Customizing PPoint	1	Customize menu.
Printing	2	Change printer, print slides 2-3.
Online/Internet Use	3	Add copied text as hyperlink, send file as e-mail, display web toolbar.

Appendix C - Test Statistical Analysis

Questions in the SkillCheck Standard test for PowerPoint 97 are also divided into three *skill levels with the following distribution:*

PowerPoint 97 Test	Basic	Intermediate	Advanced
# questions	11	13	11

The SkillCheck technical manual provides full information on the SkillCheck testing and administration system, including information on test configuration and reporting.

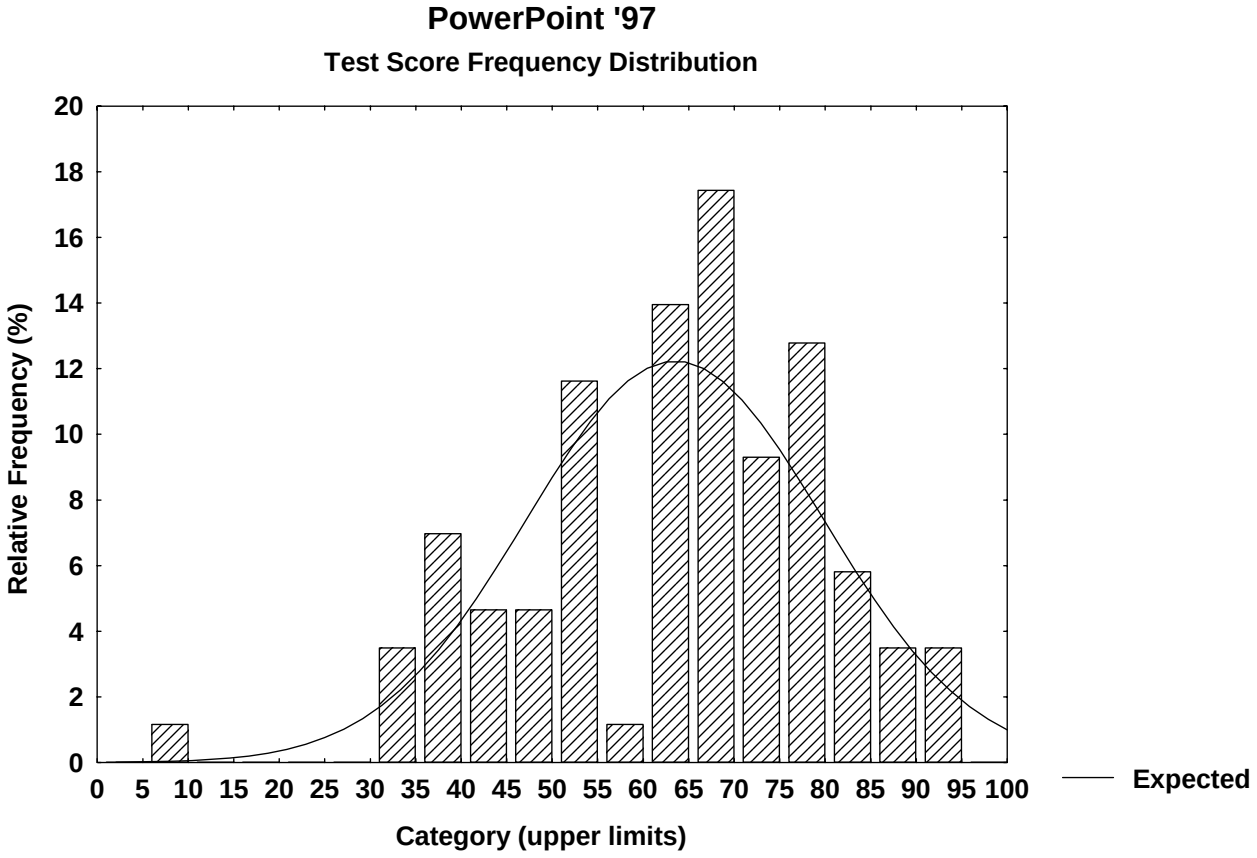
Research Method

June 1999 the Donath Group

SkillCheck obtained representative samples of test performance from 10 client organizations that deliver the test for the purpose of selecting job candidates for placement. These tests were delivered under standard conditions. The test performance data was cleaned to eliminate practice tests, multiple administrations to the same individuals.

Test Performance

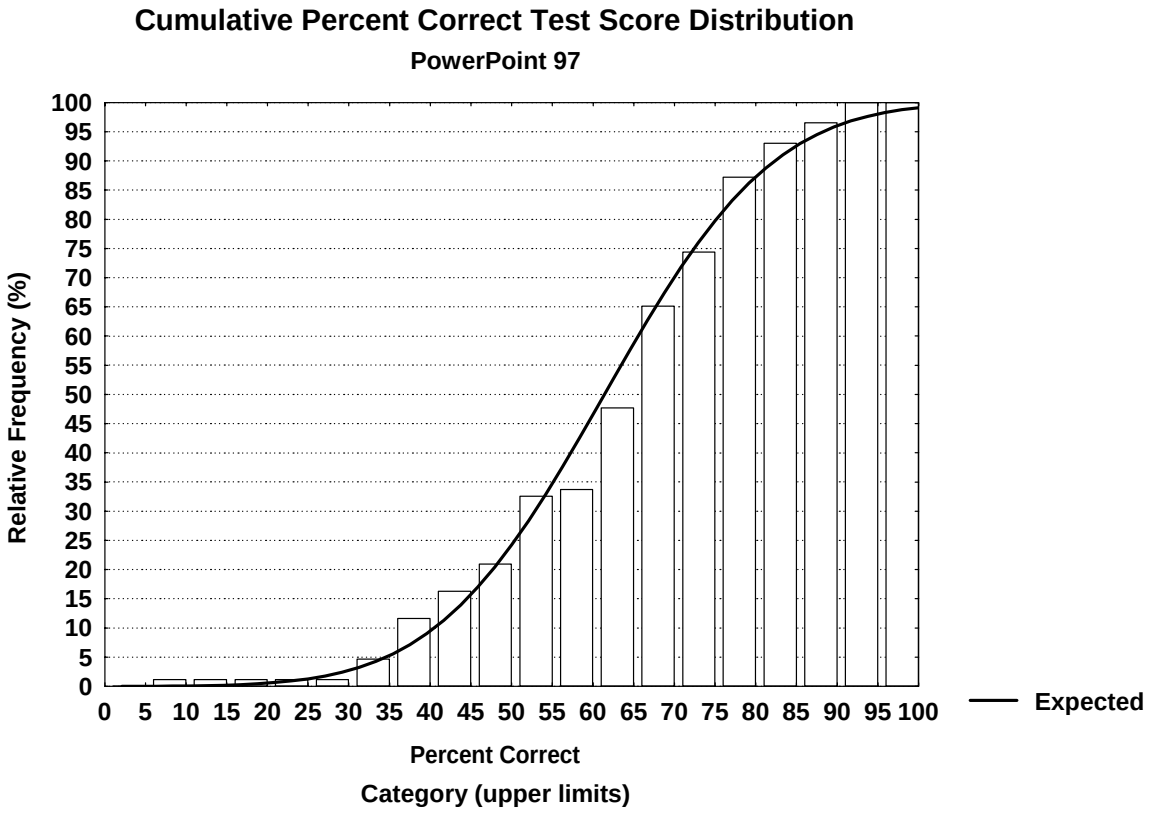
The graph below depicts PowerPoint 97 Standard test performance in a frequency distribution of test scores. This data was obtained from a representative sample of test takers.



Appendix C - Test Statistical Analysis

Descriptive Statistics							
	Valid N	Mean	Confid.- 95.000%	Confid.+ 95.000%	Median	Std.Dev.	Standard Error
Percent Correct	86	63.49	59.99	66.98	66.00	16.30	1.76

Test Score Frequency		
	Count	Percent
0.0000 < x <= 10.000	1	1.16
10.000 < x <= 20.000	0	0.00
20.000 < x <= 30.000	0	0.00
30.000 < x <= 40.000	9	10.47
40.000 < x <= 50.000	8	9.30
50.000 < x <= 60.000	11	12.79
60.000 < x <= 70.000	27	31.40
70.000 < x <= 80.000	19	22.09
80.000 < x <= 90.000	8	9.30
90.000 < x <= 100.00	3	3.49



Appendix C - Test Statistical Analysis

The percentile ranks of percent correct test scores were calculated using a linear interpolation method. Therefore, this information is a guide and should not be considered an exact number percent correct relationship to the percentile rank.

Percentile Rank	Percent Correct
99th	100
95th	90
90th	85
85th	80
80th	79
75th	77
70th	75
65th	70
60th	69
55th	68
50th	66
45th	65
40th	64
35th	63
30th	55
25th	53
20th	50
15th	45
10th	39
5th	37

Appendix C - Test Statistical Analysis

Internal Consistency Reliability Coefficient (KR-20): .88
Standard Error of Measurement: 5.65
Average inter-item correlation: .221575

Test Item Question	Point-biserial correlation	Valid N	P-Value
Q002	0.63	86	0.78
Q005	0.43	86	0.92
Q014	0.50	85	0.93
Q016	0.52	85	0.82
Q018	0.50	86	0.99
Q019	0.42	86	0.81
Q024	0.70	86	0.70
Q026	0.28	86	0.87
Q028	0.66	86	0.77
Q031	0.48	86	0.66
Q033	0.30	86	0.67
Q036	0.49	86	0.67
Q046	0.17	86	0.79
Q053	0.47	86	0.77
Q054	0.44	86	0.58
Q058	0.61	86	0.93
Q064	0.45	86	0.72
Q071	0.23	86	0.33
Q072	0.42	86	0.20
Q077	0.07	86	0.03
Q081	0.22	86	0.60
Q083	0.29	86	0.62
Q084	0.30	86	0.33
Q094	0.31	86	0.22
Q098	0.25	86	0.12
Q099	0.22	86	0.16
Q101	0.63	86	0.47
Q104	0.41	37	0.95
Q105	0.55	85	0.44
Q106	0.64	84	0.64
Q112	0.41	37	0.68

Typing Test

Introduction

SkillCheck's Typing Test evaluates keystroke speed and accuracy. Examinee performance is measured for gross words per minute that yields both gross data entry speed in keystrokes per hour and net data entry speed that adjusts for the number of errors using the following formula[2]:

(Gross Typing Speed) – ([Number of Errors] x [Error Multiplier]) = Net Typing Speed

In the example on page 3, Net Typing Speed equals:

(82 words per minute) – ([1.4 errors per minute] x [3]) = 77.8 words per minute Net Typing Speed

Test Specification

The SkillCheck Typing Test allows an examinee to type from a printed document into a single entry field. Keyboard editing is allows in the document (entering of text, Delete and Backspace key for deleting characters, keyboard navigation with arrow keys, ability to select text with keyboard), although manipulating text with the mouse is not available.

At the end of a specified time period (five minutes in the Standard test) the test ends and scores are calculated automatically. Errors are analyzed for error type (misspelled word, split words, etc.) and calculations are performed automatically for gross and net typing speed. In a word processing environment, net typing speed is calculated by multiplying errors per minute by three and subtracting the resulting value from gross typing speed.

Through the test-customization tools available with SkillCheck's testing product, various settings in the SkillCheck typing test are adjustable, including test time, error multiplier and text used as a typing test. This validation study was conducted on SkillCheck's standard typing test with settings of five minutes and an error multiplier of three. (See Appendix D for more information on creating and customizing tests.)

[2] To understand how the error multiplier affects net typing speed, assume it takes one second to type a word incorrectly (typing "ADN" instead of "AND" for example). In a word-processing environment, it usually takes another second to delete the incorrect word (using the **Delete** or **Backspace** key) and a third second to type the word correctly. In order to take these factors into account when calculating net typing speed, *Typing Test* multiplies the errors per minute by three.

Research Method

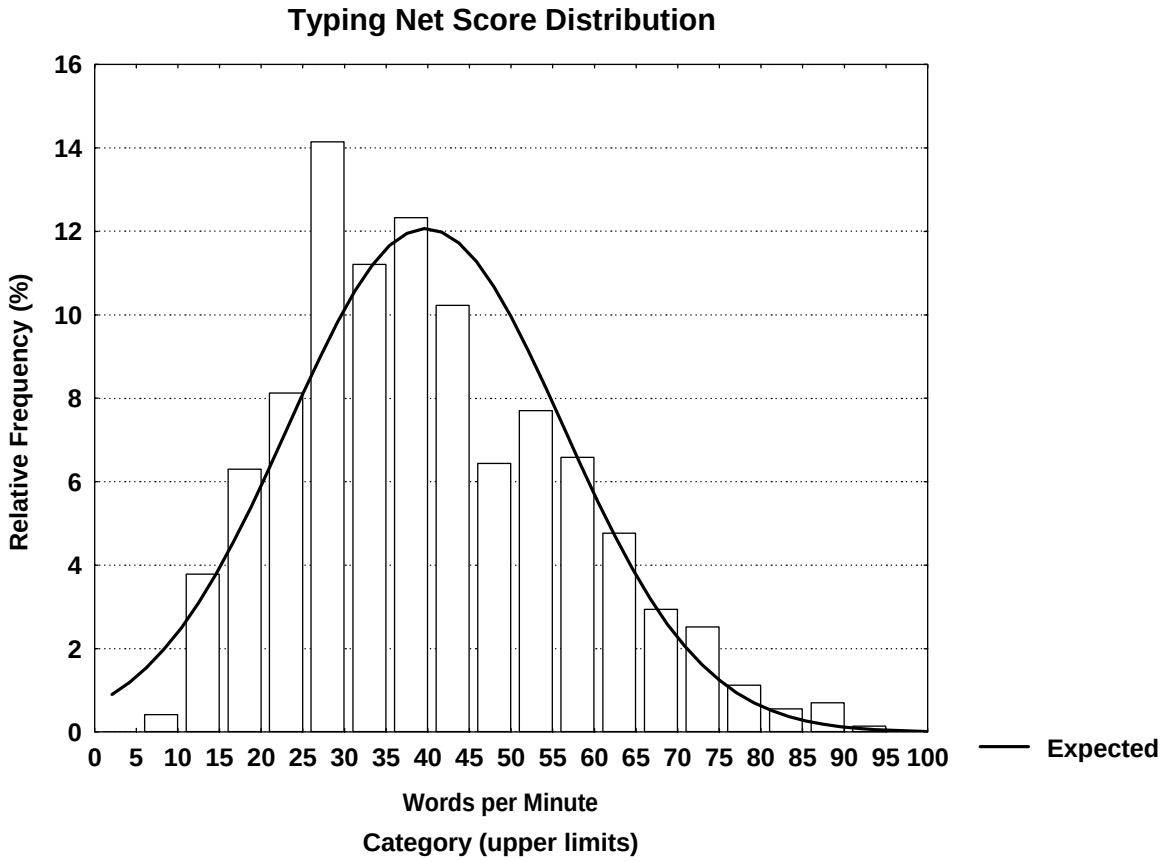
June 1999 The Donath Group

SkillCheck obtained representative samples of test performance from 10 client organizations that deliver the test for the purpose of selecting job candidates for placement. These tests were delivered under standard conditions. The test performance data was cleaned to eliminate practice tests, multiple administrations to the same individuals and extreme cases of test performance. Extremely low performance and extremely high performance were removed for the purposes of this report Additionally, each net score of words per minute was consistently calculated across all examinees by using the standard adjustment factor for errors as described in the SkillCheck Professional 3.1 User Manual (Chapter 11, page 5).

Test-retest reliability was found to be .92.indicating excellent test reliability with a standard error of measurement of 4.68. The test was administered to a small set of test takers twice (20). The words per minute test score on one test were correlated with their test score on the second test. The correlation coefficient of .92 indicates that the test measures consistently over time.

Test Score Distribution

The graph below depicts typing test performance in a frequency distribution of NET test scores. This data was obtained from a representative sample of test takers.

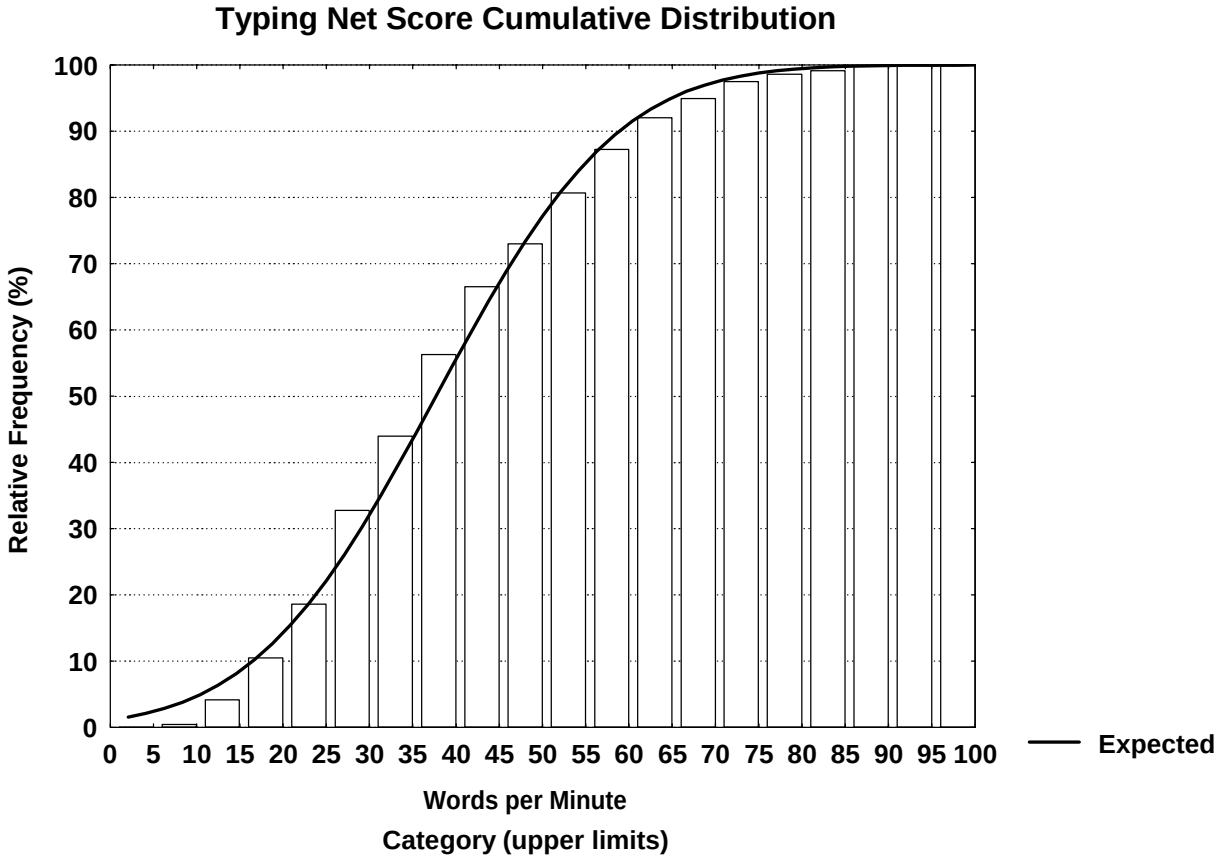


Descriptive Statistics							
Typing	**Valid N**	**Mean**	**Confid. -95.%**	**Confid. +95%**	**Median**	**Std.Dev**	**Standard Error of Mean**
Net Score	714	39.76	38.54	40.97	37.50	16.53	0.62

Appendix C - Test Statistical Analysis

Test score means as determined by SkillCheck grade groupings.

NET Score Category	Means	N	Std.Dev.
Below Average	15.97	82	3.25
Average	31.17	330	5.50
Good	49.71	214	5.77
Very Good	67.81	78	5.12
Excellent	86.17	10	2.91
All Groups	39.76	714	16.53



Words per minute and percentile rank

The percentile ranks of words per minute were calculated using a linear interpolation method. Therefore, this information is a guide and should not be considered an exact number of words per minute relationship to the percentile rank.

Percentile Rank	Words per minute
99th	100
95th	70
90th	65
85th	60
80th	55
75th	54
70th	49
65th	48
60th	44
55th	40
50th	39
45th	38
40th	35
35th	34
30th	29
25th	28
20th	28
15th	24
10th	20
5th	17

Appropriate Test Score Use

Test scores discriminate well between high and low job performers and thus provide a very useful and accurate measure of typing skills. Test scores can be used to:

- Assess needs for typing training
- Select candidates for jobs that require strong typing skills
- Assess typing training program effectiveness

Alphanumeric Data Entry Test Performance Analysis

Introduction

SkillCheck's Alphanumeric Data Entry Tests evaluate keystroke speed and accuracy. Examinee performance is measured for gross data entry speed that yields both gross data entry speed in keystrokes per hour and net data entry speed that adjusts for the number of errors using a the following formula[3]:

(Gross Data Entry Speed) – ([Number of Errors] x [Adjustment Factor converting Number of Errors to Keystrokes per Hour]) = Net Data Entry Speed

Test Specification

The SkillCheck Data Entry Test allows an examinee to type from printed forms into a series of online forms on the computer screen. Keyboard editing is allows in the forms (entering of text, Delete and Backspace key for deleting characters, keyboard navigation with arrow keys, ability to select text with keyboard), although manipulating text with the mouse is not available.

At the end of a specified time period (five minutes in the Standard test) the test ends and scores are calculated automatically. Errors are analyzed for error type (misspelled word, split words, etc.) and calculations are performed automatically for gross and net data entry speed. In an electronic data entry environment, net data entry speed is calculated by multiplying errors per minute by three and subtracting the resulting value from gross data entry speed.

Through the test-customization tools available with SkillCheck's testing product, various settings in the SkillCheck data entry test are adjustable, including test time, error multiplier and text used as a typing test. This validation study was conducted on SkillCheck's standard data entry test with settings of five minutes and an error multiplier of three. (See Appendix D for more information on creating and customizing tests.)

[3] To understand how the error multiplier affects net data entry speed, assume it takes one second to enter a data string (number or text) incorrectly (for example, entering "STEET" instead of "STREET"). In a data entry environment, it usually takes another second to delete the incorrect string (using the **Delete** or **Backspace** key) and a third second to type the string correctly. In order to take these factors into account when calculating net keystroke speed, the *Data Entry Test* multiplies the errors per minute by three.

Research Method

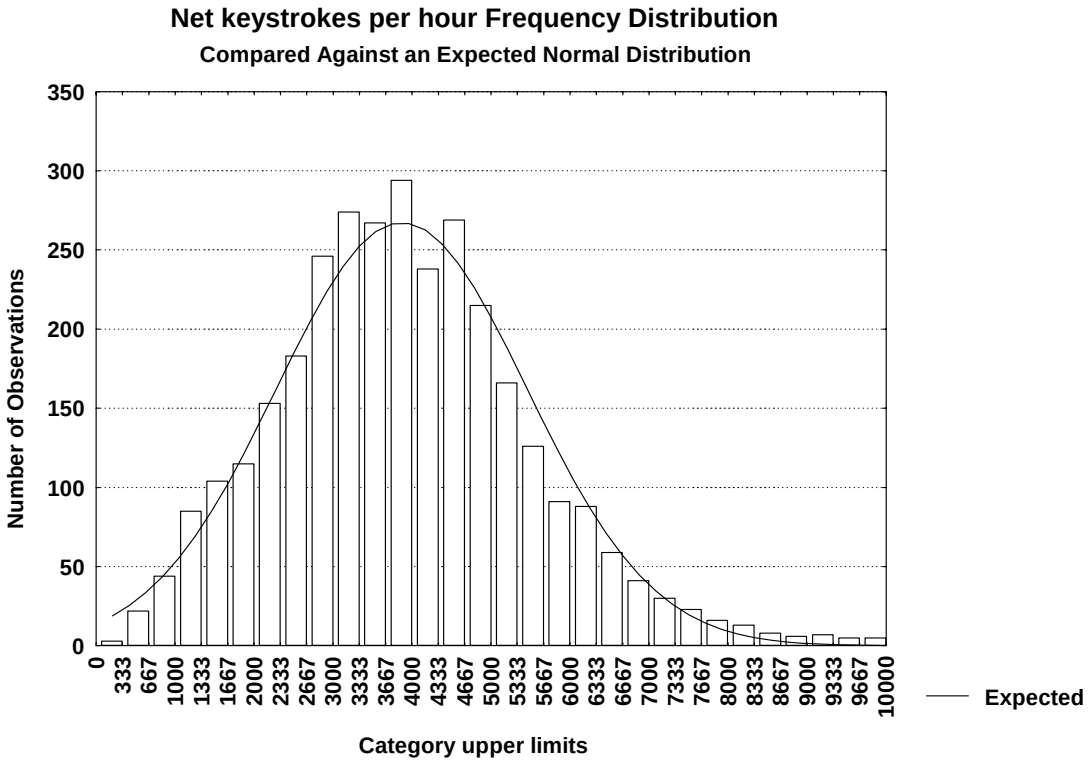
June 1999 The Donath Group

SkillCheck obtained representative samples of test performance from 10 client organizations that deliver the test for the purpose of selecting job candidates for placement. These tests were delivered under standard conditions. The test performance data was cleaned to eliminate practice tests, multiple administrations to the same individuals and extreme cases of test performance. Extremely low performance and extremely high performance were removed for the purposes of this report. Four tests scores with over 10,000 keystrokes per hour were eliminated. Additionally, each net score of keystrokes per hour was consistently calculated across all examinees by using the standard adjustment factor for errors as described in the SkillCheck User Manual.

Test-retest reliability was found to be .90 indicating excellent reliability with a standard error of measurement of 502.96. The test was administered to a small set of test takers twice (20). The keystroke per hour test score on one test was correlated with their test score on the second test. The correlation coefficient of .90 indicates that the test measures consistently over time.

Test Score Distribution

The graph below depicts data entry test performance in a frequency distribution of test scores. This data was obtained from a representative sample of test takers.



Net Keystrokes per Hour Descriptive Statistics

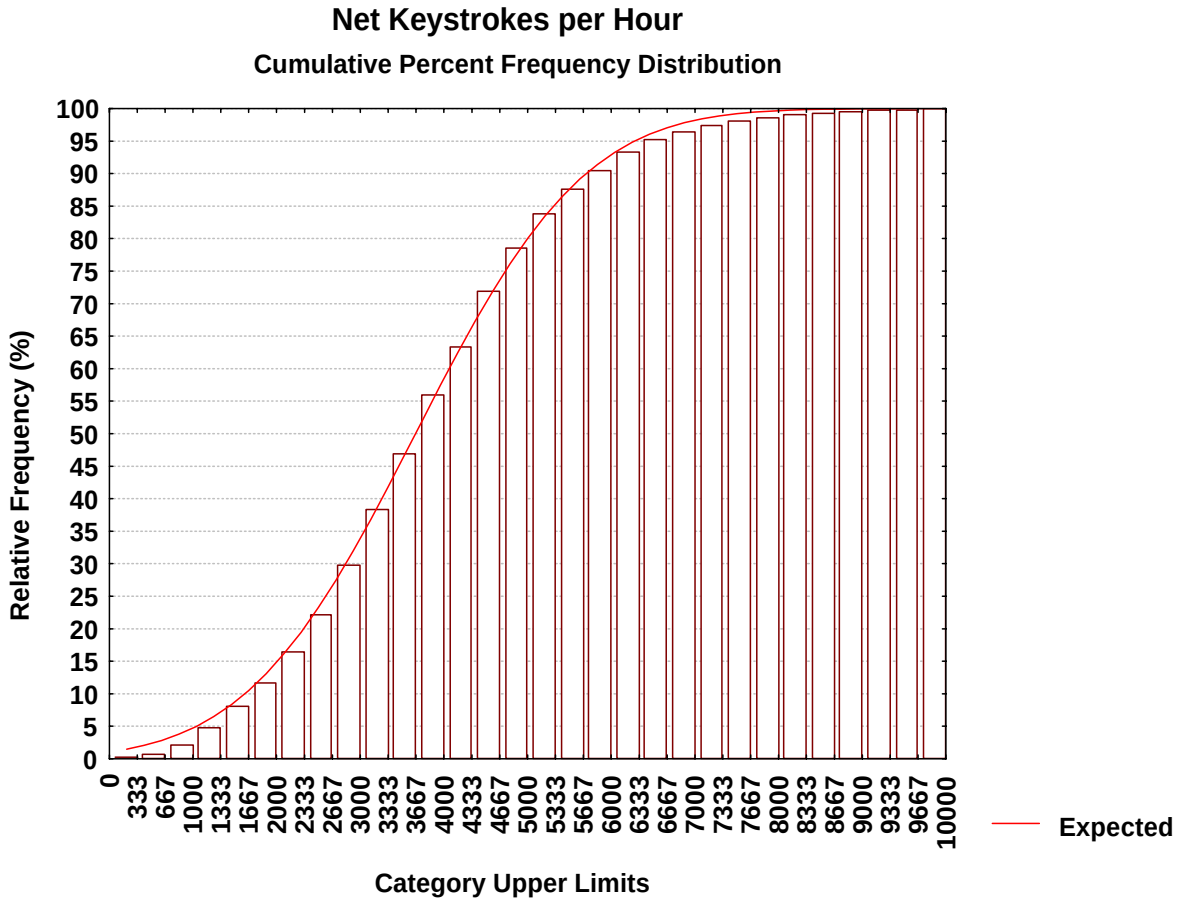
Valid N	Mean	Confid. -95%	Confid. +95%	Median
3196	3868.621	3813.458	3923.785	3777.5

Lower Quartile	Upper Quartile	Range	Quartile Range	Std.Dev.	Standard Error of Mean	Skewness	Kurtosis
2816.00	4808.0	9863.00	1992.00	1590.52	28.134	.471313	.466224

Test score means as determined by SkillCheck grade groupings.

Net Score	Means	N	Std.Dev.
Below Average	2757.42	1786	877.52
Average	4807.49	1107	533.20
Good	6677.11	259	538.96
Very Good	8820.68	44	604.41
All Groups	3868.62	3196	1590.52

The chart below compare keystroke intervals per hour and observed frequency in the normative group with relative percent frequency (percentile rank).



Keystrokes per hour and percentile rank

The percentile ranks of keystrokes per hour were calculated using a linear interpolation method. Therefore, this information is a guide and should not be considered an exact number of keystrokes per hour relationship to the percentile rank.

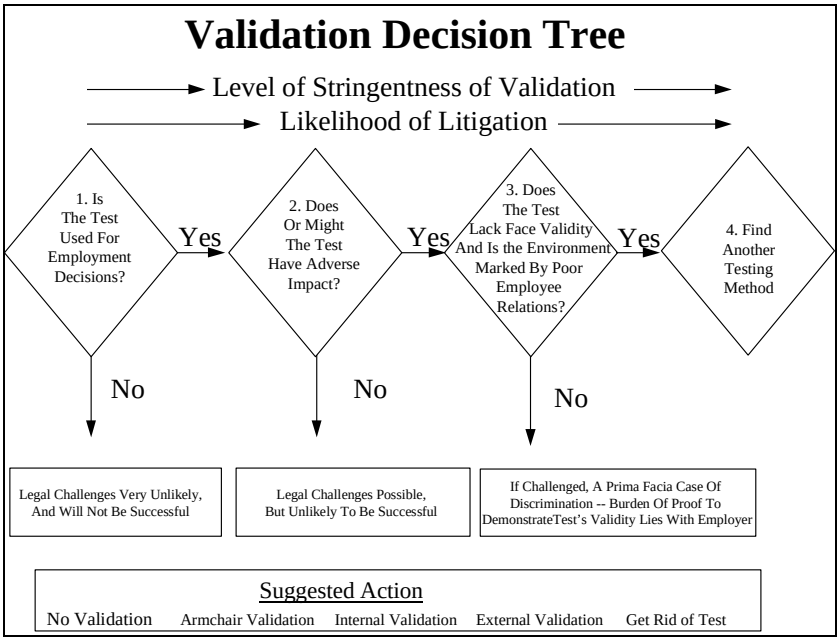
Percentile Rank	Keystrokes per hour
99th	8500
95th	6992
90th	6000
85th	5900
80th	5466
75th	4977
70th	4945
65th	4479
60th	4442
55th	3666
50th	3777
45th	3608
40th	3411
35th	3202
30th	3006
25th	2816
20th	2559
15th	2218
10th	1854
5th	1364

Appropriate Test Score Use

Test scores discriminate well between high and low job performers and thus provide a very useful and accurate measure of data-entry skills. Test scores can be used to:

- Assess needs for data-entry training
- Select candidates for entry-level data-entry jobs
- Assess data-entry training program effectiveness

Figure 1: Validation Decision Tree



Validation Issues In The Use Of The Custom Tests. One of the most useful features of the SkillCheck system is the ability to create one's own tests (software tests, multiple-choice/true-false tests, typing tests and data-entry tests) to meet one's own specific needs and the needs of customers. While this capacity allows any number of tests to be developed, a custom test is not necessarily valid. Any test (including custom SkillCheck tests) must go through a process of validation before it can be considered valid.

Of course, there are some situations in which validation is not required (e.g., if the test is not used for personnel decisions). However, in most situations one will want to take some informal steps to ensure validity, and in some situations one may want to conduct a formal and rigorous validation. Such a formal validation process might be conducted by individuals within your organization or through an independent organization (such as SkillCheck, Inc. which offers such services). As with any validation process, the required level of rigor will vary according to the test's use and the context of testing (see Figure 1: The Validation Decision Tree explains these options). For example, if the test is likely to have adverse impact, then validation is strongly suggested. A few options for validation of custom tests are described below.

In some situations, there is a low likelihood of litigation and a direct link between test questions and the "job" being measured. In such a situation, one might rely solely upon an "armchair validation." For example, someone may use a custom SkillCheck test to evaluate how well someone has done in a training course for a software product. Using the SkillCheck Software Testmaker, one could select questions that correspond exactly with modules in the course curriculum. In this example, the test is a representation of the training program. Since test questions directly correspond to the training modules, and there is little chance of litigation, there is no need for any separate validation study to validate use of the test in this situation.

In other situations, one would want to conduct an informal validation. An informal validation might be appropriate when there is little likelihood of adverse impact (and thus little likelihood of litigation) but one is making personnel decisions. The goal of such a validation might be to ensure that the test is meaningful in the context of one's organization. In such a situation, one might convene a group of subject matter experts to identify the major tasks of the job (or job-element) and then select (or develop) items that represent these critical or frequent tasks. Such steps are not likely to withstand legal challenges, but one would be reasonably sure that the test is measuring important parts of the job.

With regard to creating custom SkillCheck software tests, SkillCheck software test items are simulations of tasks that are part of the job. To demonstrate content validity with a degree of rigor, one must only demonstrate that the contents of these items represent the tasks that are critical to the job or frequently encountered on the job. If one is creating a custom software test for a specific job or a specific client, the key to matching the test with the job is making sure that the test questions accurately reflect the job. Subject-matter experts (SMEs) should be included in this process. One might first have SMEs describe the task-clusters that make up the job, then have them indicate the criticality and frequency of the tasks, and then finally select items to represent these various aspects of the job.

Validation of Custom Tests Developed With The Multiple Choice/True-False Testmaker. A number of situations arise in which informal validation procedures may be used with the multiple-choice or true-false tests created with the SkillCheck TestMaker. An organization may have specific skills it needs to measure (such as company procedures or policies, or use of a specific computer program or piece of machinery). Companies in these situations may have created written tests (such as multiple-choice tests) or other types of procedures (such as verbal or hands-on "question-and-answer" routines that are, in fact, kinds of tests) to screen job applicants. Tools such as the SkillCheck TestMaker are available to automate the process of creating simple text-based tests for these custom situations. It is important to reiterate that if these informal testing tools have not gone through a formal validation procedure, the validity of the tests cannot be assured. At the same time, these tests are normally designed by subject matter experts who both understand the skills they are evaluating and understand the nature of the job in which the skills being tested will be used. In such a situation, if one is not expecting adverse impact or litigation, informal validation procedures may be preferred to expensive and time-consuming professional validation.

Taking the practical steps to complete an informal validation can help prevent one's test from being challenged on the basis of legality or validity. However, it must again be stressed that none of these procedures is a guarantee of test validity. The only way to ensure test validity is to put one's custom test through a validation procedure, such as the content or concurrent validation procedure described elsewhere in this document.

Appendix E - Sources of Additional Information

Test validation can be quite complex and technical. While the resources listed below can provide some background information on pre-employment testing and validation, there is no substitute for professional training and experience in test validation. If you anticipate any legal difficulties related to the use of your tests, please contact your SkillCheck representative. The resources listed below will provide further information:

Angoff, W.H. (1984). Scales, scores, and norms. Princeton, NJ : Educational Testing Service.

Allen, M.J. , & Yen, W.M. (1979). Introduction to measurement theory. Belmont, California : Wadsworth, Inc.

American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (1985). Standards for Educational and Psychological Testing. Washington, DC: American Psychological Association.

Arthur, Diane (1994). Workplace Testing: An employers guide to policies and practices. New York: AMACOM.

Brown, Frederick G. (1980). Guidelines for test use: A commentary on the standards for Educational and Psychological tests. National Council on Measurement in Education.

Cronbach, L. J. (1971). Test validation. In R. Thorndike (Ed.), Educational measurement. (2nd ed.) Washington, D.C.: American Council on Education.

Glaser, R., & Bond, L. (Eds.). (1981). Testing: Concepts, policy, practice and research (Special issue). American Psychologist, 36(10).

Gatewood, Robert (1990). Human Resource Selection (Second Edition). Chicago: The Dryden Press.

Hambleton, R.K. Test score validity and standard-setting methods. In R.A. Berk (Ed.) Criterion-referenced measurement: State of the art. Baltimore, MD: Johns Hopkins University Press, 1980.

Nunnally, Jum C., Bernstein, Ira H., (1994). Psychometric theory. (3rd ed.). McGraw-Hill, Inc.

Popham, James W. (1978). Criterion-referenced measurement. New Jersey: Prentice-Hall, Inc.

Society for Industrial and Organizational Psychology, Inc. (1987). Principles for the Validation and Use of Personnel Selection Procedures (Third Edition). College Park, MD.

Appendix F - EEOC Guidelines and Testing

The Uniform Guidelines on Employee Selection Procedures

The United States Equal Employment Opportunity Commission (EEOC) provides important guidelines for appropriate, non-discriminatory hiring practices as reflected in important anti-discrimination legislation, including:

- The Civil Rights Act of 1964
- The Equal Employment Opportunity Act of 1972
- The Americans with Disabilities Act

EEOC *Guidelines* cover all aspects of employment decisions, from hiring and retention to training and promotion to demotion and referral. The *Guidelines* include discussions of when testing is appropriate to make hiring and other personnel decisions and how testing should be used to avoid any employment discrimination that can lead to legal action against an employer.

Adverse Impact

Adverse impact is defined as:

"A substantially different rate of selection in hiring, promotion, or other employment decision which works to the disadvantage of a race, sex or ethnic group."

When assessing whether or not a particular hiring procedure or set of procedures is discriminatory, it is a necessary condition to prove that the consequence of those procedures leads to adverse impact against a protected group. Such protected groups include women, non-Caucasian minorities, persons over the age of 40 and, as covered by the Americans with Disabilities Act, those with a physical or mental disability.

If job candidates in a protected group feel that a particular interviewer or test has discriminated against them, it is not adequate for them to point out the discriminatory elements of their interviewing or testing experience. Rather, they must first demonstrate that the outcome of the employment procedure has led to statistically demonstrable adverse impact against one or more protected groups.

For example, if in the process of hiring to fill 100 positions, a company receives applications from 400 Caucasian and 100 non-Caucasian applicants, it would be expected that the number of hires would fall into the same ratio as number of applicants, in this case approximately 80 positions would go to Caucasians and 20 to non-Caucasian applicants.

If the actual hiring of non-Caucasians is substantially lower than the number expected from this process, then a case could be made for discrimination based on adverse impact. As a rule of thumb, 80% is considered a threshold for assessing adverse impact, so if in the example above, 17 positions (or 85% of the expected 20%) went to people within a protected group, which would likely NOT meet the threshold to prove discrimination. However, if only 15 positions went to members of a protected group (or 75% of the expected 20%), a case for discrimination could be made.

Criticality of Adverse Impact

Regardless of the specifics of the various procedures used for a particular element of employment, bottom-line proof of adverse impact is a critical hurdle to proving discrimination. If, despite flaws in a hiring process, the number of actual hires at the end of that process does not demonstrate adverse impact against a protected group, a case against an employer for discrimination would be extremely difficult to make.

Exceptions

There are cases when the needs of a business (so-called "Business Necessity") can be used as a successful defense against charges of discrimination, even if it can be proven that the businesses hiring practices show adverse impact against a protected group.

For example, some jobs (such as machine operators, drivers of commercial vehicles and airline pilots) require certain physical attributes such as unimpaired vision. Hiring for these jobs could show adverse impact against those with vision disabilities; however the employer can make the reasonable case that business necessity requires them to make hiring decisions based on physical requirements that can lead to adverse impact against the vision impaired.

Testing and Business Necessity

Testing provides a means to justify hiring practices based on certain business necessities. For example, an employer interested in hiring clerical staff has a clear need for employees who can type at a certain rate and are skilled in using one or more software products.

Skills testing on typing and word processing can provide an objective means to demonstrate which job candidates have the requisite skill to meet the requirements of the job. For example, men might be hired to fill clerical positions at a rate that indicates adverse impact against women job candidates. However, if it can be shown that objective skills testing on typing and word processing showed that male candidates who were hired performed better on tests than female candidates, a case could be made that job decisions were made based on the business necessity of hiring those with requisite demonstrable skills in key elements of the job.

Appropriate Use of Testing

The EEOC *Guidelines* describe appropriate validation procedures for testing, including Content Validity, Construct Validity and Criterion Validity described starting on page 3 of this document. While the use of high quality, valid tests are an important element of building testing into an employment procedure, it is equally important that employers utilize "best practices" for testing and other elements of employment processes.

In the case of testing, it is important that:

- Tests are given consistently (i.e., that testing is not used for some candidates for a particular job and not others).

Appropriate Use of Testing (continued)

- Tests be given in a suitable environment (such as a quiet room, free from distractions that could affect test scores)
- Tests are suitably proctored to ensure that all candidates are given the same instructions and are not able to cheat on a particular test

Concerning general employment practices that involve testing, it is equally critical that:

- Test scores alone are not used to make hiring decisions and that scores are used in conjunction with other information (resume, interview, job references, etc.) to build a more complete profile of a job candidate.
- The use of particular tests needs to be clearly demonstrated as part of a particular job. For example, a typing test is clearly appropriate in the case of hiring for clerical positions; however it would be less appropriate for other jobs such as food service or assembly line workers.
- That ALL aspects of the employment processes are clearly documented.

Given that the proof of adverse impact is a necessary condition for proving discrimination that can lead to legal action, employers should monitor their own hiring and other employment procedures to ensure that the outcome of those procedures does not adversely affect any protected group.

Appendix G - Specialized Testing Products

About Specialized Testing Products

Most of the tests described in this validation documentation are traditional fixed forms covering specific skills. For example, SkillCheck Standard tests on Microsoft Office applications consist of 35 performance-based test items covering areas determined by SkillCheck's content validation studies to cover the most important and frequently used features of each Office product. Similarly, tests on skills such as typing and data entry provide exercises simulating work-sample activities that measure a candidate's ability to quickly and accurately type or enter data into computerized documents and forms, just as they would with a word processor or automated data-entry application.

In addition to traditional fixed forms, SkillCheck has also developed a variety of specialized testing products designed to provide additional measures of knowledge, skills, abilities and aptitudes, and to streamline the testing process through the use of advanced testing methodologies. Examples of these specialized testing products are listed below.

TimeSolver

TimeSolver was designed to help SkillCheck's traditional customers in the staffing and Human Resources industries determine the skill levels of job candidates in the shortest amount of time. For industries in which productivity is an important part of the job-selection process (notably staffing services), the ability to determine candidates' skill levels quickly and accurately led SkillCheck to utilize modern testing techniques (such as performance-based and adaptive testing methods) in an effort to provide an accurate but more efficient testing solution. Information on the methodologies used to create TimeSolver appears on page 63.

TalentScout

Expanding on SkillCheck's work in adaptive-style single-skill testing with TimeSolver, SkillCheck undertook research in how to apply these methodologies to create assessments that would measure all of the most important knowledge, skills and abilities for a specific job in a single, efficient test (now called *TalentScout*). Information on the methodologies used to create this product line appears on page 67.

Call Center Scenarios

In order to bring a performance-based testing experience into assessment of skill areas such as call center customer service and sales, SkillCheck developed a series of "scenarios" tests that simulate the interaction between a customer service or sales representative and a caller in realistic simulations of call center environments. Information on the methodologies used to create SkillCheck's Call Center Scenarios tests appears on page 79.

QuickTrait/Identity

SkillCheck's *QuickTrait* line of personality-profiling instruments, to be updated in 2004 to a new line of products (called *Identity*), was developed by Dr. Jesse Llobet, a professional psychometrician and test developer specializing in the development of personality assessments. Information on the methodologies used to create SkillCheck's QuickTrait/Identity products appears on page 89.

TimeSolver Product Line

SkillCheck's TimeSolver product line consists of assessments for specific software products such as Microsoft Word, Microsoft Excel, Microsoft PowerPoint and Microsoft Access.

In contrast to SkillCheck's Standard tests which utilize a content-valid fixed form which asks a candidate to perform 35 performance-based exercises covering the most important and frequently used features of a software product, TimeSolver uses adaptive methodologies to determine a candidate's skill level in the shortest amount of time.

TimeSolver Research Methodology

In order to build a test based on adaptive structures, it was necessary to first determine the relative difficulty and importance of test items covering the most frequently used features of specific products. From SkillCheck's content and statistical test validation research, data was already available on the difficulty of several performance-based testing items already used within existing SkillCheck products. Content research also provided information on the relative importance and difficulty of specific knowledge areas, such as File Management, Editing, Printing and Formatting documents with a word-processing application such as Microsoft Word.

This research was supplemented by further survey analyses by subject matter experts on the Importance and Relevancy, Frequency of Use and Expected Passage Rate for Proficient Users for each of the test items in SkillCheck's databases of performance-based questions covering each application (Word, Excel, etc.). A sample of the survey instrument used for this research is reproduced on page 65.

This information was analyzed by The Donath Group to provide statistics upon which to develop an adaptive-style test based on the TimeSolver testing model.

TimeSolver Development Methodology

The TimeSolver testing model arranges test domains (or topics) in order of increasing difficulty. For example, it was determined that file management was a less difficult topic than editing with Microsoft Word. Equally important, it was determined that not understanding some domains precluded a candidate from performing functions in other domains. For example, someone incapable of performing application file-management functions (such as creating or opening documents) would be at a disadvantage in editing documents since they could not create or open them. Similarly, the inability to perform simple editing (like cutting and pasting text) indicates a lack of understanding of fundamental product features that, in turn, indicates a potential lack of ability in more advanced formatting features such as changing fonts and margins.

TimeSolver is organized as a series of adaptive "testlets," each providing an adaptive framework in which questions are provided to a candidate. For example, candidates begin a TimeSolver Microsoft

TimeSolver Development Methodology (continued)

Word test by being asked to perform a file-management function of moderate difficulty (saving a document in a new format). If the candidate cannot answer that question correctly, he or she is then asked to answer a less difficult file-management question (saving a file without changing format). Since a candidate who can save a file in a new format can be presumed to know how to save a file without changing format, someone answering the first Save As question correctly would then be asked a more difficult file-management question.

Each test end-point (in conjunction with error information from within each testlet) is used to assign the candidate to a "bin," associated with a score and description of the candidate's performance and level of skill.

How does Computer Adaptive Testing (CAT) work?
by Cliff Donath, Industrial Psychologist, The Donath Group

What an adaptive test does is to automatically mimic a wise examiner who asks questions based on test takers' responses. Specifically, if an examiner asks a question that is too difficult for the test taker, the next question asked should be easier. If the question turns out to be too easy, a more difficult question should be asked.

This line of questioning follows the observation that we learn little about the ability of a person if we ask only easy questions or ask only difficult questions. We learn more when we accurately direct our questions at the same level as the test taker's proficiency.

In addition to increased efficiency of computer-adaptive testing other advantages of CAT include:

- Improved test security: Since test questions vary depending on the skill level of the examinee, not everyone is taking the same test, making it more difficult for a test to become ineffective due to item overexposure.

- Everyone is challenged but not discouraged by a test that is too difficult.

How does SkillCheck TalentScout take advantage of Computer Adaptive Testing?

SkillCheck adaptive tests are unique in that they use a combination of test-item-response data and subject-matter experts' judgments to design a solid adaptive test that focuses on critical content and item difficulty. The result is a test that both discriminates well between proficient and less proficient levels of performance while reducing test taking time and maintaining test score reliability and validity.

Subject Matter Expert Survey Instrument - Sample

QNID	QUESTION NAME	QUESTION TEXT	Average Importance/ Relevance to Proficiency (1-5)	Frequency of Performing Task as a Proficient User (1-5)	Percent at Proficient Level Passing this test item (%)	Under what topics would you classify this item? File Management Editing Formatting Printing Analysis Customizing Internet
			5 - Critically important/essential 4- Very Important 3 - Of modest or mid-level importance 2- Of little importance 1- Not important	5 - Always perform 4 - Perform very often 3 - Perform often 2 - Perform not very often 1 Never perform	What percent of minim proficient users would you expect to pass this test item?	
Q001	Create New Workbook - Blank	Without closing the current workbook, create a new blank workbook.	5	4	100	File Management
Q002	Open Workbook	Open an Excel 97 workbook named "MUSEUM EXPANSION" located in the current disk drive and directory.	5	4	100	File Management
Q003	Close Workbook	Close the workbook without exiting Excel. (Do not use the Control menu.)	4	4	99	File Management
Q004	Save Workbook	Save this new (unsaved) workbook under the name "MUSEUM EXPANSION" in the current disk drive and directory.	5	4	100	File Management

Sample TimeSolver Report

Word 2002 - TimeSolver

First Name: John
Last Name: Smith
ID: 12345
Date: 03/04/04
Time: 16:48 EST
Time Taken: 4 minute(s)

Score: 8.0 (based on a scale of 0-10)

The examinee's test performance indicates familiarity with advanced document formatting in Word. The examinee also shows familiarity with file management and editing in Word, indicating a likely familiarity with Windows in general and with other Windows applications. However, the test performance also indicates that the examinee may not be familiar with other advanced features of Word, such as macros. In addition, the test performance shows that there may be some "holes" in the examinee's knowledge of printing and formatting. The examinee can be sent on assignments that require the creation and editing of complex documents. It is recommended that the examinee receive "brush up" training on specific Word features before he or she is required to use Word at the highest level.

TalentScout Product Line

SkillCheck's TalentScout testing products are designed to test all of the most critical knowledge, skills and abilities (KSAs) for a specific job in a single, efficient test. The TalentScout line currently covers the following positions:

- Clerical/Administrative Position
- Legal Admin Office Position
- Call Center/Customer Service Position
- Medical Admin Office Position
- Computer and Internet User Position
- Accounting/Bookkeeping Position
- MS Office 2000 User
- MS Office 2000 Power User
- MS Office XP User
- MS Office XP Power User

The research methodology described below was used to determine the appropriate KSAs to measure within each TalentScout assessment. For each knowledge, skill or ability being measured, SkillCheck made use of the most efficient method of assessment, for example: utilizing TimeSolver adaptive tests for applications like Microsoft Word as a "testlet" within a TalentScout test.

TalentScout Research Methodology

To determine the most critical knowledge, skills and abilities required for a particular job, SkillCheck utilized the following sources of information:

- A survey of employers in the staffing services industry
- The Occupational Information Network (O*NET) database, cross referenced with the Dictionary of Occupational Titles (DOT) and the Occupational Outlook Handbook (OOH)

This information was utilized to ensure that each TalentScout test covered the appropriate areas from a content validation standpoint. Research used to determine KSAs to cover in the Clerical/Administrative Position TalentScout assessment appears on the following pages.

TalentScout - Sample Survey Question and Results

Question: For the job of an Administrative/Clerical employee, how would you rate the importance of the following job skills?

Percentage indicates the total respondent ratio	1 Not Useful	2 Useful, but not important	3 Average Importance	4 Important	5 Highly Important/Critical
1. Typing Speed and Accuracy	0%	0%	0%	31%	69%
2. Data Entry Speed and Accuracy	0%	0%	23%	8%	69%
3. Spelling Ability	0%	0%	15%	46%	38%
4. Grammar/Language Ability	0%	0%	23%	38%	38%
5. Filing Ability	0%	8%	38%	23%	31%
6. General Computer Literacy	0%	8%	8%	23%	62%
7. Word-Processing Skills	0%	0%	0%	31%	69%
8. Spreadsheet Skills	0%	0%	8%	69%	23%
9. E-Mail/Internet Browsing Skills	0%	8%	31%	54%	8%
10. Logic and Reasoning Skills	0%	8%	23%	38%	31%

O*NET Custom Report for:

43-6014.00 - Secretaries, Except Legal, Medical, and Executive

Perform routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.

Tasks

- Answer telephones and give information to callers, take messages, or transfer calls to appropriate individuals.
- Arrange conferences, meetings, and travel reservations for office personnel.
- Complete forms in accordance with company procedures.
- Compose, type, and distribute meeting notes, routine correspondence, and reports.
- Greet visitors and callers, handle their inquiries, and direct them to the appropriate persons according to their needs.
- Locate and attach appropriate files to incoming correspondence requiring replies.
- Mail newsletters, promotional material, and other information.
- Maintain scheduling and event calendars.
- Make copies of correspondence and other printed material.
- Open, read, route, and distribute incoming mail and other material, and prepare answers to routine letters.
- Schedule and confirm appointments for clients, customers, or supervisors.
- Set up and maintain paper and electronic filing systems for records, correspondence, and other material.
- Take dictation in shorthand or by machine, and transcribe information.
- Collect and disburse funds from cash accounts, and keep records of collections and disbursements.
- Conduct searches to find needed information, using such sources as the Internet.

- Coordinate conferences and meetings.
- Establish work procedures and schedules, and keep track of the daily work of clerical staff.
- Learn to operate new office technologies as they are developed and implemented.
- Manage projects, and contribute to committee and team work.
- Operate electronic mail systems and coordinate the flow of information both internally and with other organizations.
- Order and dispense supplies.
- Prepare and mail checks.
- Provide services to customers, such as order placement and account information.
- Review work done by others to check for correct spelling and grammar, ensure that company format policies are followed, and recommend revisions.
- Supervise other clerical staff, and provide training and orientation to new staff.
- Operate office equipment such as fax machines, copiers, and phone systems, and use computers for spreadsheet, word processing, database management, and other applications.

Knowledge (Importance >60%)

Importance	Knowledge
100	**Clerical** — Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.
75	**English Language** — Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
67	**Computers and Electronics** — Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.
63	**Customer and Personal Service** — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.
63	**Telecommunications** — Knowledge of transmission, broadcasting, switching, control, and operation of telecommunications systems.

Work Activities (Importance >60%)

Importance	Work Activity
88	**Communicating with Supervisors, Peers, or Subordinates** — Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
88	**Communicating with Persons Outside Organization** — Communicating with people outside the organization, representing the organization to customers, the public, government, and other external sources. This information can be exchanged in person, in writing, or by telephone or e-mail.
83	**Interacting With Computers** — Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
79	**Processing Information** — Compiling, coding, categorizing, calculating, tabulating, auditing, or verifying information or data.
79	**Establishing and Maintaining Interpersonal Relationships** — Developing constructive and cooperative working relationships with others, and maintaining them over time.
75	**Getting Information** — Observing, receiving, and otherwise obtaining information from all relevant sources.
75	**Performing Administrative Activities** — Performing day-to-day administrative tasks such as maintaining information files and processing paperwork.
75	**Performing for or Working Directly with the Public** — Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.
75	**Documenting/Recording Information** — Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic form.

71 **Evaluating Information to Determine Compliance with Standards** — Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

63 **Scheduling Work and Activities** — Scheduling events, programs, and activities, as well as the work of others.

63 **Handling and Moving Objects** — Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.

TalentScout Testing Methodology

For each job skill determined from the research methodology described above to be included in a TalentScout test, SkillCheck utilized the most efficient method of testing to ensure that each skill could be measured in the shortest amount of time. This included:

- TimeSolver adaptive testing methodology (described on page 63) for skills such as word processing
- Shortened versions of SkillCheck's Typing and Data Entry Speed and Accuracy assessments for keyboarding skills
- QuickTrait logic and reasoning and personality-profiling assessments (described on page 88) for these components of specific TalentScout assessments

Each skill was rated based on appropriate measurement systems for each "testlet" (bin-based scoring for adaptive TimeSolver skills tests, norming information for typing, logic and reasoning, personality profiling instruments, etc.).

Based on importance ratings from content research, certain skills were weighted more heavily than others in the determination of an overall score (for example, typing and word processing were weighted more heavily than other skills in the Administrative/Clerical TalentScout test, such as logic and reasoning, spelling and grammar).

TalentScout Reporting

The purpose of the TalentScout report is to provide test administrators with both scoring values and descriptive information in order to provide a rounded profile of a job candidate. For example, overall score and scores for each KSA "testlet" are associated with descriptive text explaining the meaning of the score and details that can be determined from the candidate's test performance.

The report also includes suggestions for further testing and training in order to help the test administrator determine additional dimensions of the candidate's fitness for a particular job. For example, it was determined that spreadsheet ability, while important for some clerical jobs that involve working with numbers, was not critical enough to be included in the TalentScout assessment for the general Administrative/Clerical job category. However, testing and training suggestions that appear at the end of the report instruct the test administrator that further testing in this area can help determine a candidate's readiness to work in a clerical environment where working with numeric information is a critical job task.

A sample TalentScout report appears on the following pages.

Sample TalentScout Report

Testing Results

Test information

TalentScout - Administrative/Clerical Position
John Smith 000-00-0000
10/1/02 10:33 AM 18 minute(s)

Performance Analysis

Skill Area	0 1 2 3 4 5	Score	Grade
Overall Performance		4.0	Above Avg

Skill Area	0 1 2 3 4 5	Score	Grade
Typing		4.5	High
Word Processing		1.5	Below Avg
Logic and Reasoning		5.0	High
Spelling Skills		4.0	High
Language Skills		3.5	Average

Detailed Descriptions of Results

Overall Performance

Score 4.0 (Above Average Performance)

Description The candidate demonstrated Above Average ability in most, if not all, of the skill areas required in a clerical/administrative position. In the case of job-specific skills, the candidate's results indicate that he or she types reasonably quickly and accurately, or that he or she has a strong understanding of word-processing

software, or both. The candidate's performance in general skills, such as language, logic and reasoning, while mixed, is also Above Average or better in most cases. While the candidate's score indicates a readiness to work in most clerical/administrative positions, it is recommended that his or her score in each skill area be reviewed against the skills required in a job assignment to ensure that this above-average candidate is the right fit for a specific job. You may want to consider training in any area measured as Average, Below Average or Low in the detailed results below (as well as the general training and suggestions at the end of the report) to further improve this candidate's readiness to handle any assignment.

Performance in Each Skill Area

Description The job of a clerical/administrative employee consists of a number of diverse skills. Some relate to everyday tasks performed on the job, including typing/keyboarding and using a word-processing program. Other skills, including language skills and the ability to think logically impact the success of an employee in diverse aspects of many jobs.

The candidate's overall score is a composite of his or her performance in each of these skill areas, with different weighting given to different skill areas. The candidate's scores in each skill area are summarized and described in detail below.

Typing/Keyboarding Skills

Score 4.5 (High performance)

Details

Test Duration	Gross Typing Speed	Number of Errors	Errors per Minute x3	Net Typing Speed
3.00 minutes	82 words per minute (24,718 keystrokes per hour)	7	4.2	77.8 words per minute (23,462 keystrokes per hour

Description The candidate's score in this skill area indicates that he or she is in the top 5% of typists with regard to typing speed and accuracy, meaning that he or she types more quickly and accurately than 95% of other typing candidates.

Word Processing Skills

Score 1.5 (Low performance)

Description The examinee's test performance indicates familiarity with Windows and Microsoft Word file management operations. However, the test performance also

indicates that the examinee is not familiar with Word basics (such as print functions) and may also be unfamiliar with advanced Windows file management operations (such as the use of document templates). It is recommended that the examinee not be sent on any assignments involving the use of Microsoft Word before being given training on Word basics at a minimum.

Spelling and Language Skills

Score 4.0 (High performance)

Description In most cases, the candidate demonstrated the ability to spell standard terms of significant complexity. The candidate also demonstrated the ability to accurately spell terms in specialized areas (such as legal terminology).

Language Skills

Score 3.5 (Above average performance)

Description When presented with sentences with an above-average or high level of complexity, the candidate was able to identify sentences that were constructed with the correct grammar, punctuation and usage in half of the cases.

Logic and Reasoning Skills

Score 5 (High performance)

Description The reasoning score is superior to that of most other people in the study sample. This individual is very likely to be a quick learner, will resolve problems using logic and reasoning, and has the ability to understand and carry out detailed instructions with minimum supervision. This is definitely an area of strength for this individual.

Training Suggestions

The candidate's performance on this TalentScout test indicates that additional training or practice is suggested in the following areas:

- Word Processing Basics (with Microsoft Word or some other word-processing program)

Additional Testing and Training Suggestions

Appendix G - Specialized Testing Products

While this TalentScout test covers the most important knowledge, skills and abilities for the job of an administrative/clerical position, some administrative positions require additional skills in working with quantitative information. If this is the case in your organization, the following additional tests could provide additional useful information:

- Data Entry
- Microsoft Excel

In addition, some offices prefer candidates who demonstrate a well-rounded understanding of computer technology, such as computer hardware, software, networks, e-mail, and the Internet. If this is the case with your organization, testing in the following areas is recommended:

- Computer/Digital Literacy
- Internet Literacy
- Electronic Mail
- Web Browsing

SkillCheck's Call Center Scenarios Tests

SkillCheck's Call Center Scenarios tests attempt to simulate a real-world call center environment in which test candidates engage in simulations of exchanges with callers for the purpose of providing customer service or interacting with prospects at different stages of the sales cycle.

Examples of interactive screens from each Call Center Scenarios test appear on page 82. In each case, a candidate is presented with information from a simulated customer service/sales CRM system explaining the status of the customer/prospect. The call begins with the playing of an audio file that begins the conversation between the call center representative and a caller. The candidate interacts with the caller by selecting the best response from five options (each provided in on-screen text and audio format).

Based on the candidate's selection, the candidate is scored on one or more scales during each interactive exchange.

Customer Service Scenarios

The Customer Service Scenarios test requires a candidate to engage in a series of exchanges with each caller. Based on the option a candidate selects, the "conversation" can go in any number of directions. In this way, the assessment simulates a real exchange between a customer service representative and a caller.

The simulated exchange may include:

- Answering questions from a caller
- Finding information to solve a caller's problem using the simulated CRM system
- Providing information to the caller based on his or her requests and information gained from the CRM system
- Categorizing the call accurately
- Providing suggestions for follow up to the call

Calls vary in difficulty and include scenarios involving problem solving or providing requested information to callers. Difficulty of calls and point scores associated with each interaction were based on subject-matter expert input during the scripting/design process.

During the course of each call, the candidate is measured on several scales, including:

- Manners (did the candidate select a response that is the most friendly and respectful to a caller)
- Effectiveness (did the candidate select a response that quickly moves to resolution of a problem or finding of information)
- Accuracy (how quickly and accurately did the candidate utilize the simulated CRM system)

Customer Service Scenarios (continued)

- Analysis (how well did the candidate characterize the call upon its completion)
- Follow Up (did the candidate select the best follow up option after the call was completed

Depending on the overall score a candidate receives for a single call (based on a calculated value of some of the scale scores described above), the candidate may then receive a more complex or less complex interactive call as the next scenario. In this way, the candidate moves through an adaptive-style pathway, ending in a "bin" that specifies the candidate's overall score, with descriptive text characterizing the candidate's performance on the assessment.

The score report also includes information on each of the five scales described above (see the sample report on page 83). Keep in mind that the overall score is calculated based on the adaptive framework of the test that is based on a formula that weights information from more than one scale differently. While in most cases, the overall score will be reflected in the individual scale scores, in some cases overall score may appear higher or lower than an average of all scale scores.

Scores on each scenario were calibrated using information from 257 candidates who took the Call Center Customer Service Scenarios test during the validation/review process. An update of scores is currently being performed based on new data from over 2000 test takers.

Sales Scenarios

Because the nature of the sales process can be divided into distinct areas, with important knowledge required to manage each of those stages, the Call Center Sales Scenarios test is organized around four stages of the sales cycle:

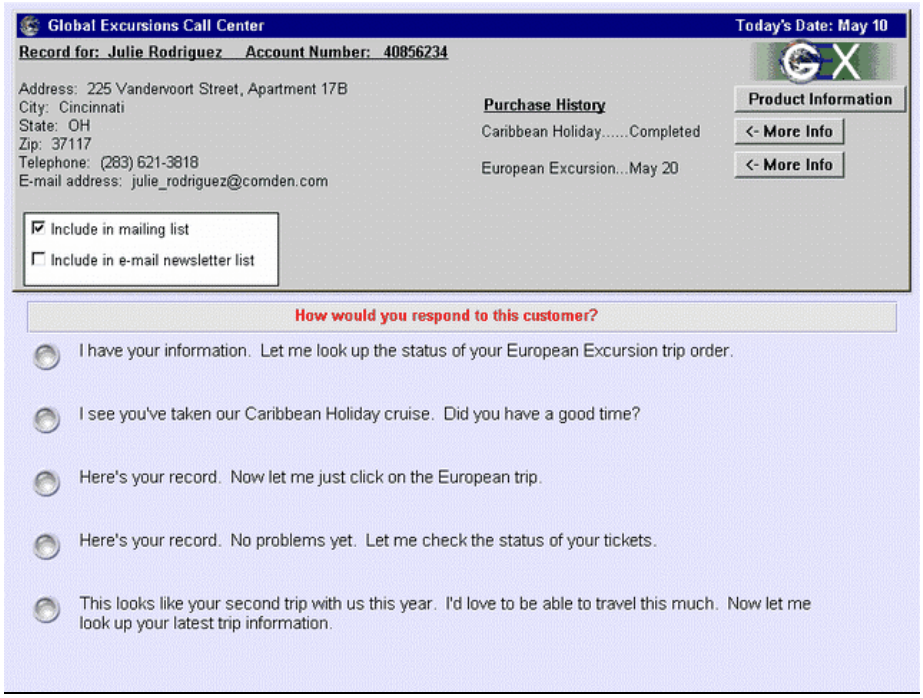
- Prospecting
- Gathering Information/Controlling the Sale
- Dealing with Objections
- Closing

Within each of those four categories, a candidate will interact with four different prospects, each with a unique issue regarding one of the four areas describe above. For example, scenarios regarding Dealing with Objections may include:

- Objections over price
- Objections over the size of the salesperson's company (too large or too small)
- Competitive issues
- Issues regarding an unwillingness to move forward towards a purchase

Sales Scenarios (continued)

In each case, the candidate must select a response to a customer's issue that best handles the situation and try to move the sales process forward. The candidate is scored based on his or her selection of responses to each scenario. A score report includes an overall score, as well as a score within each of the four stages of the sales cycle.



Call Center Customer Service Scenarios Screen

Call Center Customer Sales Scenarios Screen

Sample Call Center Customer Service Report

Call Center Customer Service - John Smith

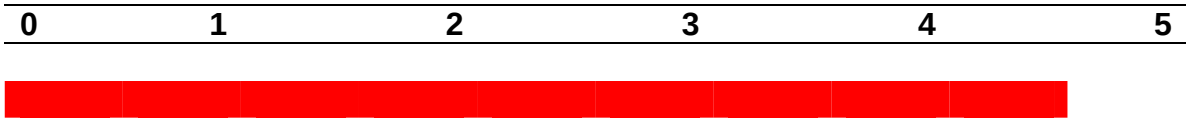
Candidate: John Smith
Candidate ID: 000-00-0000

Test: Call Center Customer Service

Date of Test: 07/16/02
Time of Test: 10:33 AM
Test Duration: 5 minute(s)

Overall Score

Overall Candidate Performance



Score: 4.5 (High overall performance)

Overall Analysis

The candidate worked with simulated call center scenarios in which he or she was required to handle two different types of customer service calls:

- **Problem Solving Calls** in which the candidate had to solve customer problems, such as helping customers resolve the status of an existing order or handling customers with simple or complex complaints.

- **Informational Calls** in which a candidate had to provide an existing customer or a potential customer with information about the status of an existing order or about company products and services.

The candidate showed strong performance in handling complex problem-solving calls that require accessing information from different sources (customer information, product information, company policies, etc.). The candidate's problem-solving abilities include strong performance when dealing with angry customers or customers with complex needs.

The candidate showed strong performance when dealing with complex informational calls in which the candidate had to find information from multiple sources, draw conclusions from available information and navigate the system to find answers to customer questions.

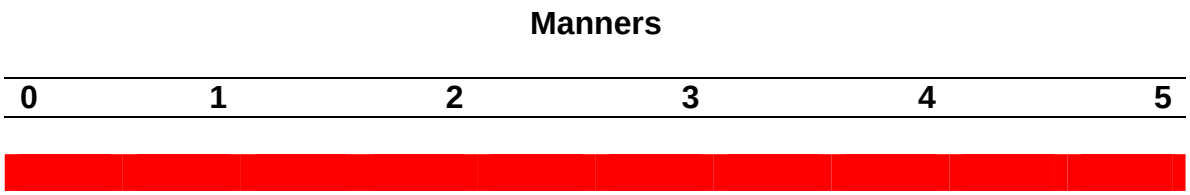
Scale Scores

In addition to the candidate's overall performance, the candidate was also measured on his or her performance on relevant scales, including manners, effectiveness, accuracy, customer analysis and ability to perform effective follow-up.

Scale scores should be reviewed in combination with the Overall score listed above. For example, a candidate with a high Manners score and a high overall score demonstrates an ability to work professionally in the most complex interactions. A high Accuracy score and a lower Overall score demonstrates an understanding of navigating call center or customer relations management software, but a lower level of customer service skill in working with customers to provide information or solve problems.

Manners

When working in a customer service environment, a call center candidate must approach customers with professional courtesy: apologizing when appropriate, treating callers with respect, reassuring customers (including avoiding planting unnecessary doubt or concern in the customer's mind), avoiding unnecessary small talk and demonstrating patience, even with the most angry callers.

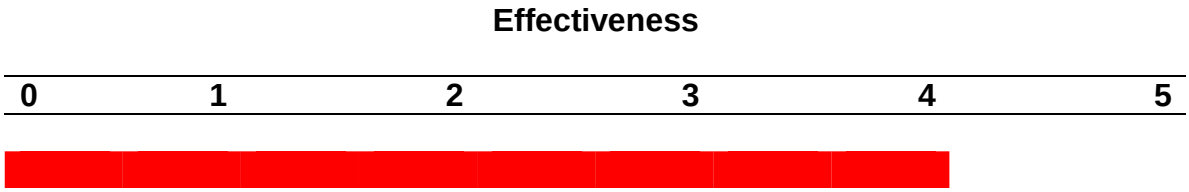


Score: 5.0 (High performance)

Analysis: The candidate showed strong performance in showing proper manners and respect to callers, including angry callers and callers with complex needs. In all situations, the candidate selected the best responses and statements that treated the caller politely and respectfully.

Effectiveness

In addition to being polite, a call center representative must answer questions and provide information in a way that resolves a caller's issues quickly and conclusively. An effective call center representative collects information from a caller in a fast, efficient manner, does not distract the customer with unnecessary questions or statements, finds information the caller needs, and provides answers to questions in a clear and unambiguous way.

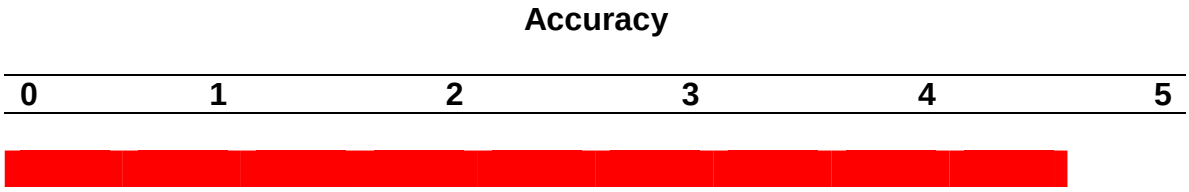


Score: 4.0 (High performance)

Analysis: The candidate showed strong performance in working with callers, selecting responses that will elicit from callers the information needed to solve problems, or finding answers to caller questions in a fast and efficient manner. While the candidate did not select the best responses in every situation, overall the candidate demonstrated strong ability to work effectively with callers. Careful training in company policies is recommended for this candidate. However, the candidate's score indicates sound judgment in working efficiently in a customer service environment.

Accuracy

Most call center environments require a representative to navigate a computerized call center system, such as a customer relationship management (CRM) or a general customer-service software package. This call center assessment provides a simulation of such a system and measures the candidate's ability to find information using the simulated system accurately.



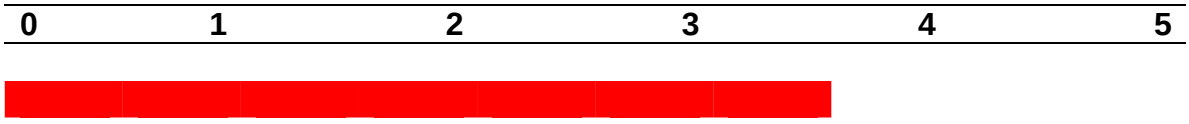
Score: 4.5 (High performance)

Analysis: The candidate demonstrated strong ability to navigate the call center system to find information or make changes to customer records, making almost no errors in utilizing the system accurately. In some cases, the candidate may not have performed an operation in the most optimal manner (searching for a record using a customer's first name, rather than their complete name, for example). However, the candidate's overall performance indicates a strong understanding of the principles behind working with CRM or customer-service call-center software.

Analysis

At the end of every call, the candidate is required to analyze the nature of the call he or she has just completed. The candidate's analysis score indicates his or her ability to analyze a call and a caller correctly, determining the caller's emotional state (polite, angry, etc.) and understand the caller's needs.

Analysis

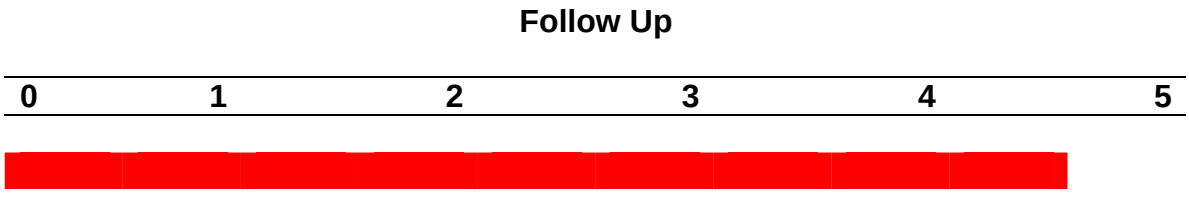


Score: 3.5 (Above average performance)

Analysis: The candidate demonstrated an above average ability to analyze a caller's emotional state and to specify the needs of a caller correctly. In some cases, the candidate may have misjudged the exact nature of the call. Overall, however, the candidate showed good judgment in analyzing a call once it was completed.

Follow Up

At the end of every call, the candidate was required to indicate specific follow-up activity that should take place after the call. This could include providing caller information to other departments (such as sales) for a follow-up call, sending suggestions to different departments to help avoid problems in the future, or providing information to supervisors for callers with complex questions that cannot be handled by the candidate.



Score: 4.5 (High performance)

Analysis: The candidate showed strong ability to select the most appropriate follow-up activities to take place at the end of each call. The score also demonstrates that, when passing a difficult call onto a supervisor, the candidate showed good judgment in correctly describing the nature of the call and caller to their managers. This score also indicates that the candidate understands that in many situations, no follow-up activity is required.

Attitude and Aptitude Assessments

SkillCheck's *Identity* product line includes a set of aptitude and attitude assessments designed by Dr. Jesse Llobet, an industrial psychologist with over ten years of experience designing personality-profiling instruments for the Human Resources market and other fields.

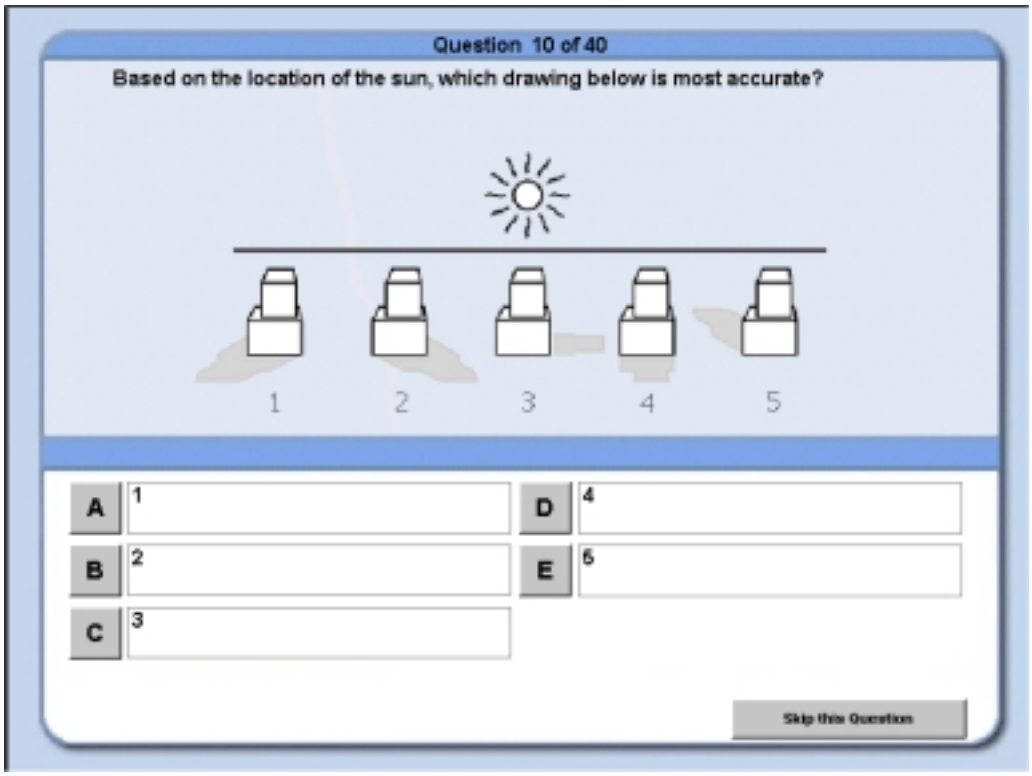
Identity will combine single-scale "testlets" into a series of assessments covering the following areas:

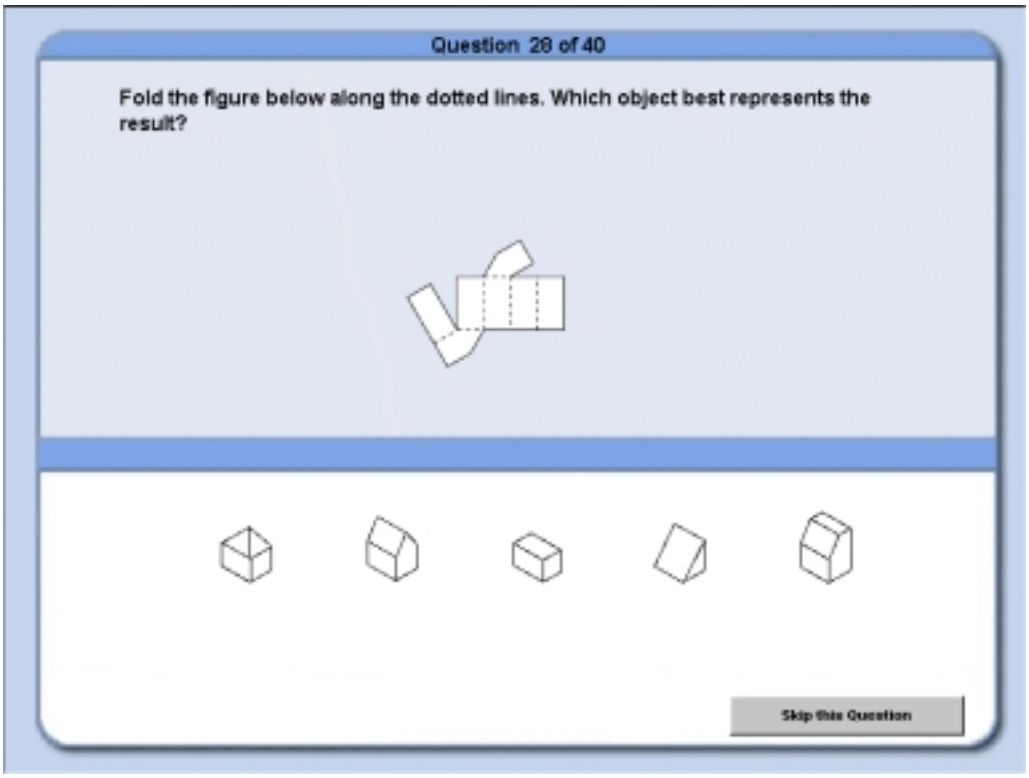
- Identity - Cognitive
- Identity - Risk Free
- Identity - Service
- Identity - Sales
- Identity - Workplace Personality
- Identity - Workplace Skills

A detailed description of each Identity assessment appears on the following pages, followed by a description of the validation process used in the development of Identity on page 103. A sample report from an Identity assessment appears on page 132.

Test Name	Identity-Cognitive
Number of Questions	40
Type of Questions	Multiple Choice
Time Limit	12 minutes
Test Description	Cognitive ability or general aptitude has consistently proven to be a valid predictor of performance and training success, across most, if not all, job functions. SkillCheck's Identity-Cognitive test provides a general indication of a job candidate's abilities with problem solving, comprehension and communication. It is also a valid gauge of an individual's training potential. This test serves as a valuable tool for screening individuals based on cognitive abilities needed to be successful on the job.
Scales Covered	**Mathematical and Logical Reasoning** - Mathematical and Logical Reasoning measures the degree to which the individual is likely to reason logically and to understand and solve basic mathematical problems. **Verbal Reasoning** - Verbal Reasoning measures the degree to which the individual is likely to understand logical relationships among words, including word comprehension and association.

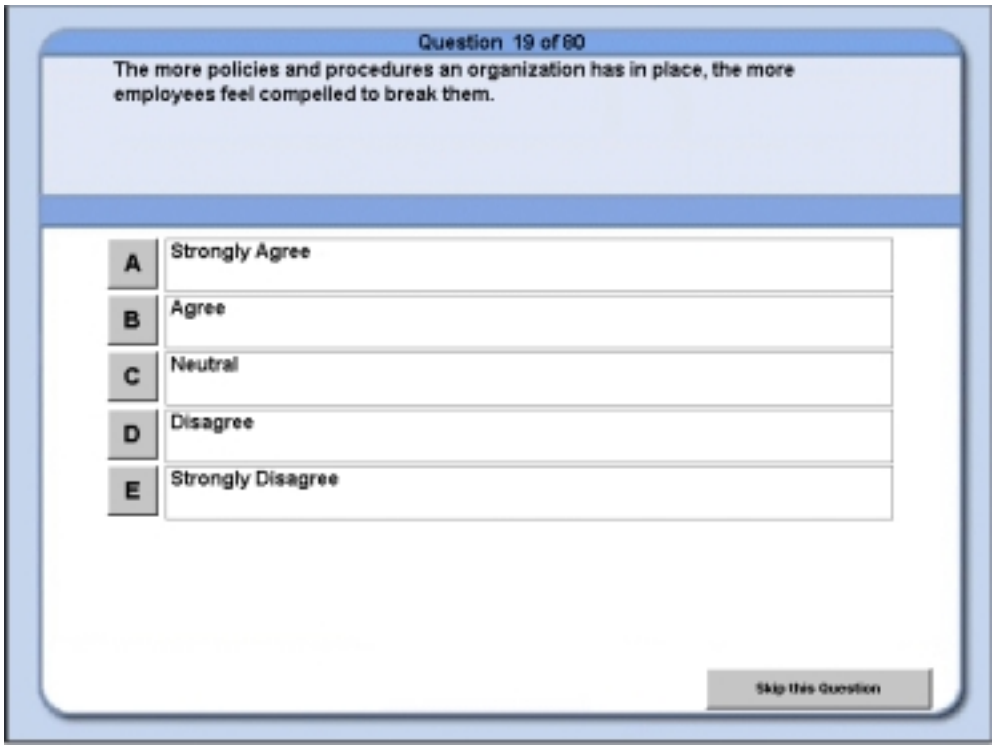
Sample Test Questions

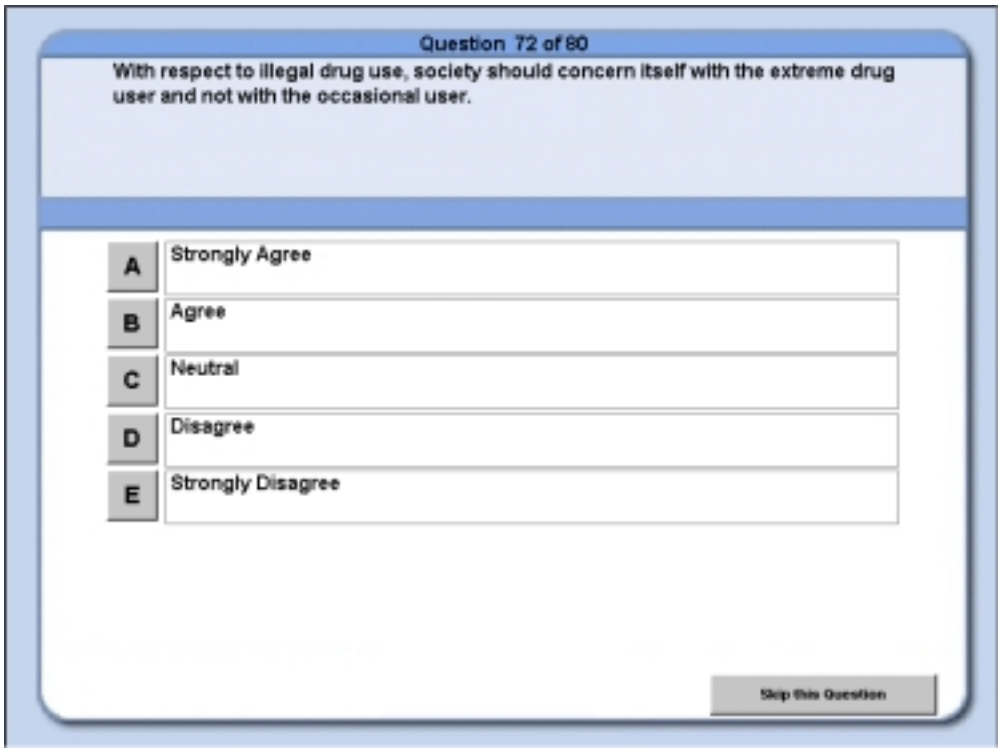




Test Name	Identity - Risk Free
Number of Questions	80
Type of Questions	Likert Scale (see sample questions)
Time Limit	Unlimited
Test Description	Workplace violence, substance abuse and theft result in annual corporate financial losses of over $100 billion each year, making sound hiring decisions a critical bottom-line issue. Fortunately, the degree of risk an individual brings to the workplace can be determined by measuring that person's attitudes and behavioral tendencies along five key dimensions including drug-free and non-violent attitudes, trustworthiness, reliability, and a willingness to follow the rules. SkillCheck's Identity-Risk Free assessment reveals an individual's propensity to engage in inappropriate workplace behaviors while offering insights into specific behavioral tendencies. The test's built-in candidness scale provides also insight into how honestly the questions are being answered.
Scales Covered	**Trustworthiness** - Trustworthiness measures the degree to which the individual is likely to be honest and trusting of others. **Rules-Compliance** - Rules-Compliance measures the degree to which the individual is likely to follow company policies and adhere to rules and procedures established by management. **Reliability** - Reliability measures the degree to which the individual is likely to be dependable, hardworking, and conscientious about the quality of his/her work. **Non-Violent Attitude** - Non-Violent Attitude measures the degree to which the individual is likely to respect others and not engage in aggressive workplace behaviors such as intentionally damaging company property or resorting to physical or verbal threats. **Drug-Free Attitude** - Drug-Free Attitude measures the degree to which the individual is likely to avoid illegal drug use and related problems that might impact work. **Candidness** - Candidness measures the degree to which the individual is likely to be honest in his/her responses and is therefore not trying to outsmart the test in an effort to present him/herself in a more favorable light.

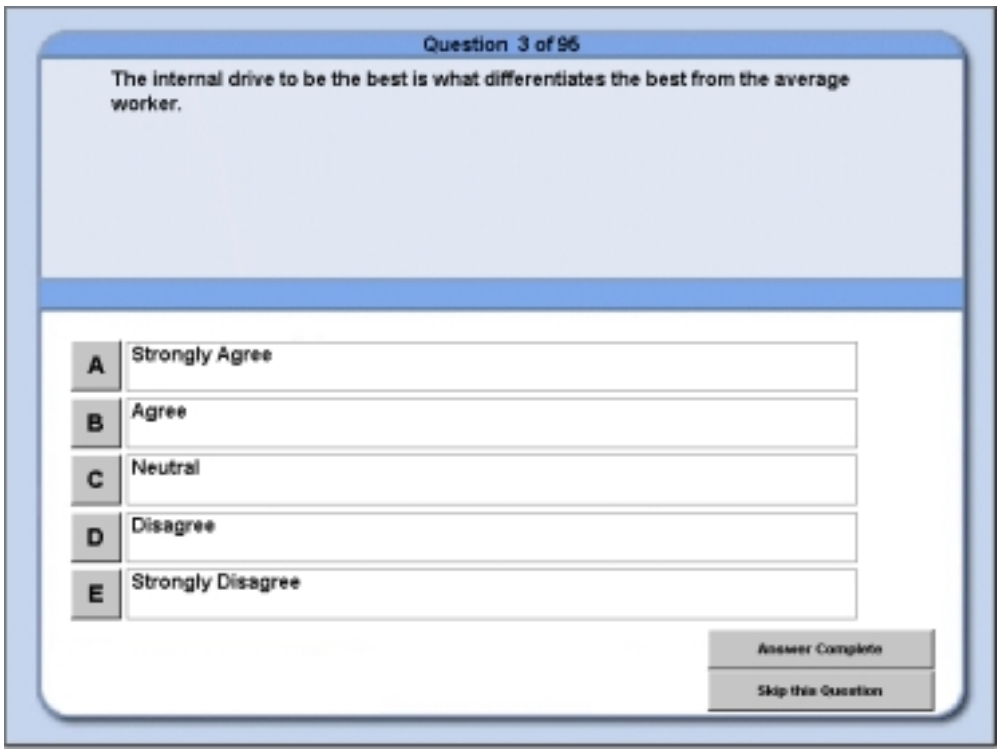
Sample Test Questions

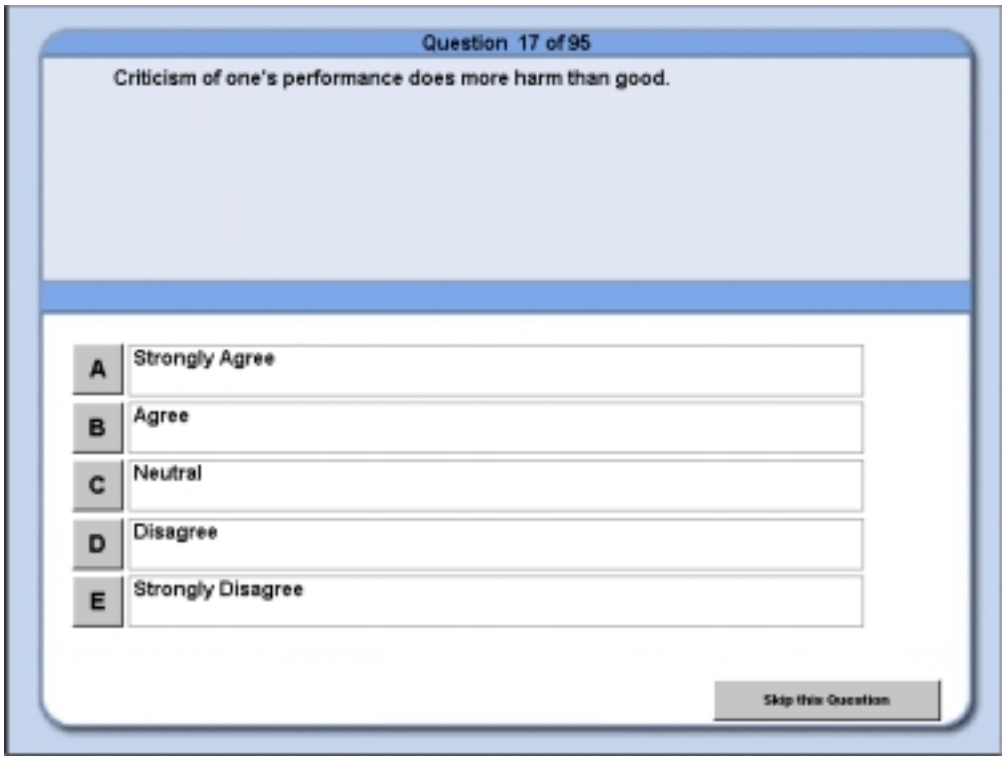




Test Name	Identity - Sales
Number of Questions	95
Type of Questions	Likert Scale (see sample questions)
Time Limit	Unlimited
Test Description	Your bottom line depends on the ability of your salespeople to persuade customers and prospects to buy your product or service. And in today's competitive environment, sales ability is critical for a wide variety jobs, not just those with direct-sales responsibility. SkillCheck's Identity-Sales assessment measures an individual's sales ability along six critical dimensions including Ambition, Self-Confidence, Assertiveness, Helping Disposition, Stress Management, and Reliability. The test also contains a built-in candidness scale to ensure that questions are being answered honestly.
Scales Covered	**Ambition** - Ambition measures the degree to which the individual is likely to be competitive and driven to be the best. **Self-Confidence** - Self-Confidence measures the degree to which the individual is likely to be self-assured, is not overly affected by what others think of him/her, and is confident in his/her decisions and actions. **Assertiveness** - Assertiveness measures the degree to which the individual is likely to assert him/herself, speak his/her mind, and enjoy taking control (when appropriate) in group situations. **Helping Disposition** - Helping Disposition measures the degree to which an individual is friendly and is likely to go out of his/her way to assist or help customers and/or co-workers. **Stress Management** - Stress Management measures the degree to which this individual is likely to demonstrate patience and stress tolerance during times of conflict with customers and co-workers and in other stressful work-related situations. **Reliability** - Reliability measures the degree to which the individual is likely to be dependable, hardworking, and conscientious about the quality of his/her work. **Candidness** - Candidness measures the degree to which the individual is likely to be honest in his/her responses and is therefore not trying to outsmart the test in an effort to present him/herself in a more favorable light.

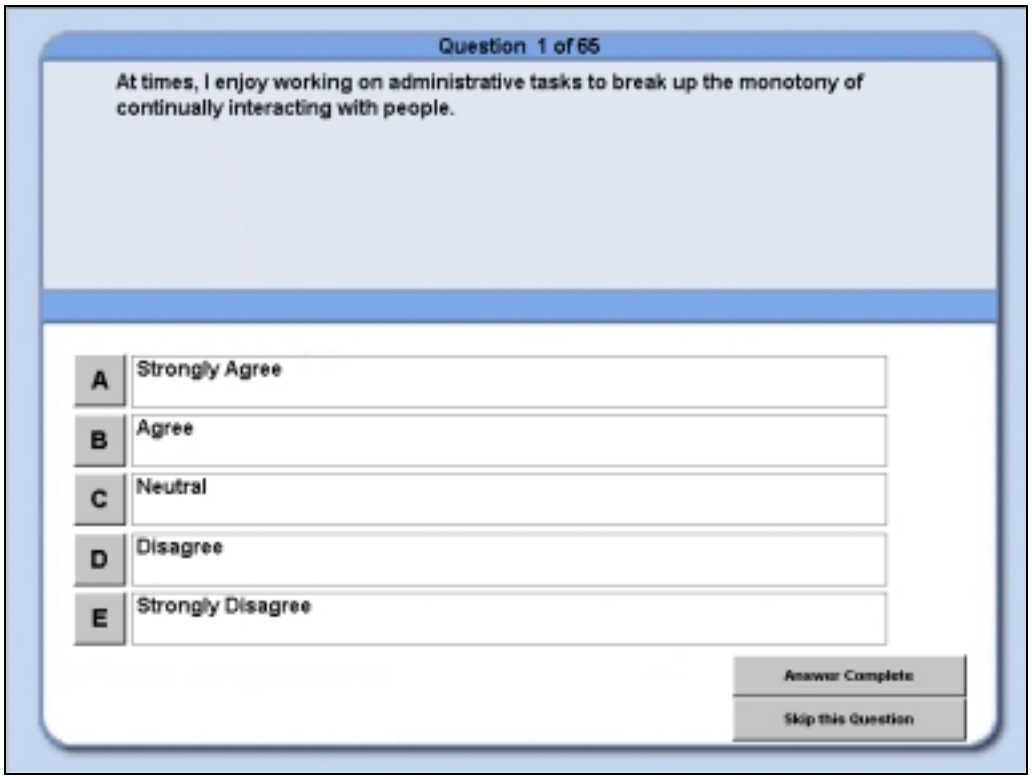
Sample Test Questions

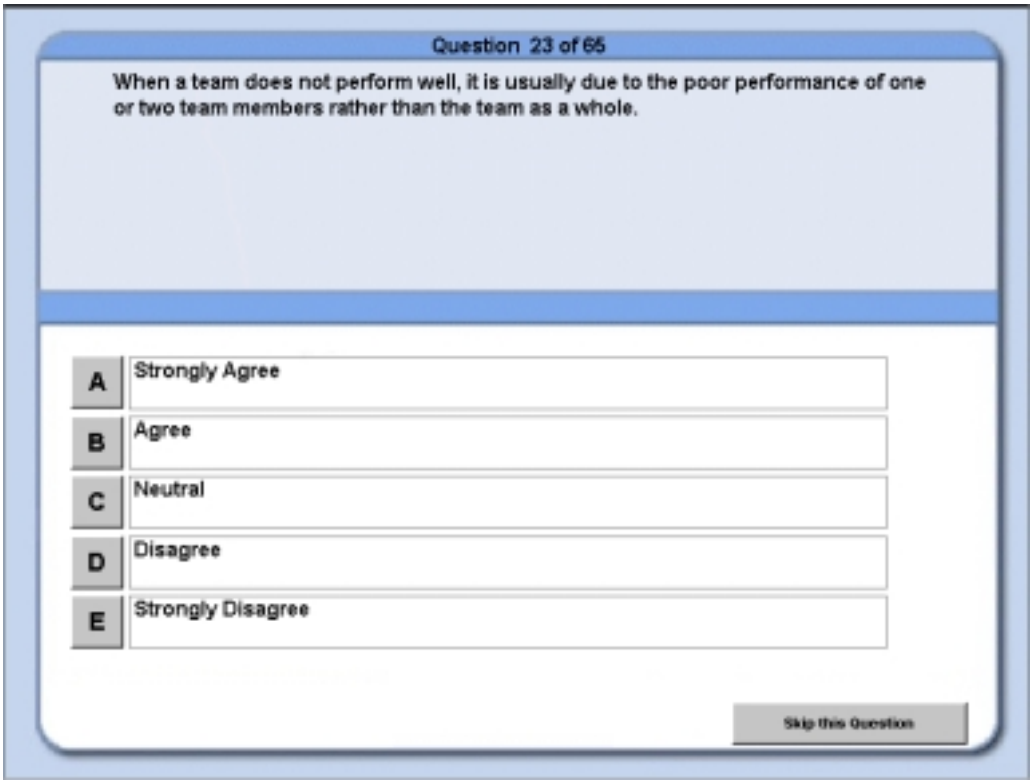




Test Name	Identity - Service
Number of Questions	65
Type of Questions	Likert Scale (see sample questions)
Time Limit	Unlimited
Test Description	In today's highly competitive marketplace, most businesses are able to provide quality products at competitive prices. This makes excellent customer service a critical success factor in today's organizations. Your employees' service orientation and customer service skills can mean the difference between success and failure in your organization. SkillCheck's Identity-Service assessment measures an individual's ability to engage in service-oriented behaviors. Covering skills and behavioral orientation in areas including Helping Disposition, Team Player, Stress Management and Reliability, the test also contains a built-in candidness scale to ensure that questions are being answered honestly. This assessment can be used for job screening, or as a selection tool or to determine where additional training may be needed.
Scales Covered	**Helping Disposition** - Helping Disposition measures the degree to which an individual is friendly and is likely to go out of his/her way to assist or help customers and/or co-workers. **Team Player** - Team Player measures the degree to which the individual is likely to cooperate in all aspects of his/her work relationships, including working in harmony with others to achieve a common goal. **Stress Management** - Stress Management measures the degree to which this individual is likely to demonstrate patience and stress tolerance during times of conflict with customers and co-workers and in other stressful work-related situations. **Reliability** - Reliability measures the degree to which the individual is likely to be dependable, hardworking, and conscientious about the quality of his/her work. **Candidness** - Candidness measures the degree to which the individual is likely to be honest in his/her responses and is therefore not trying to outsmart the test in an effort to present him/herself in a more favorable light.

Sample Test Questions

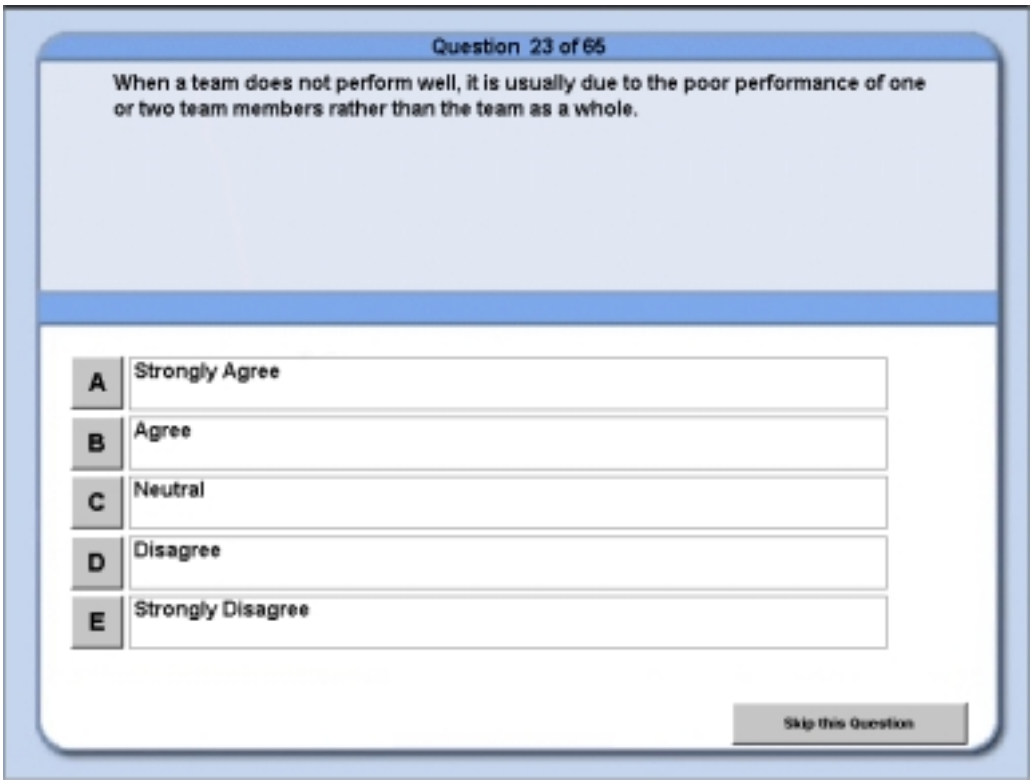


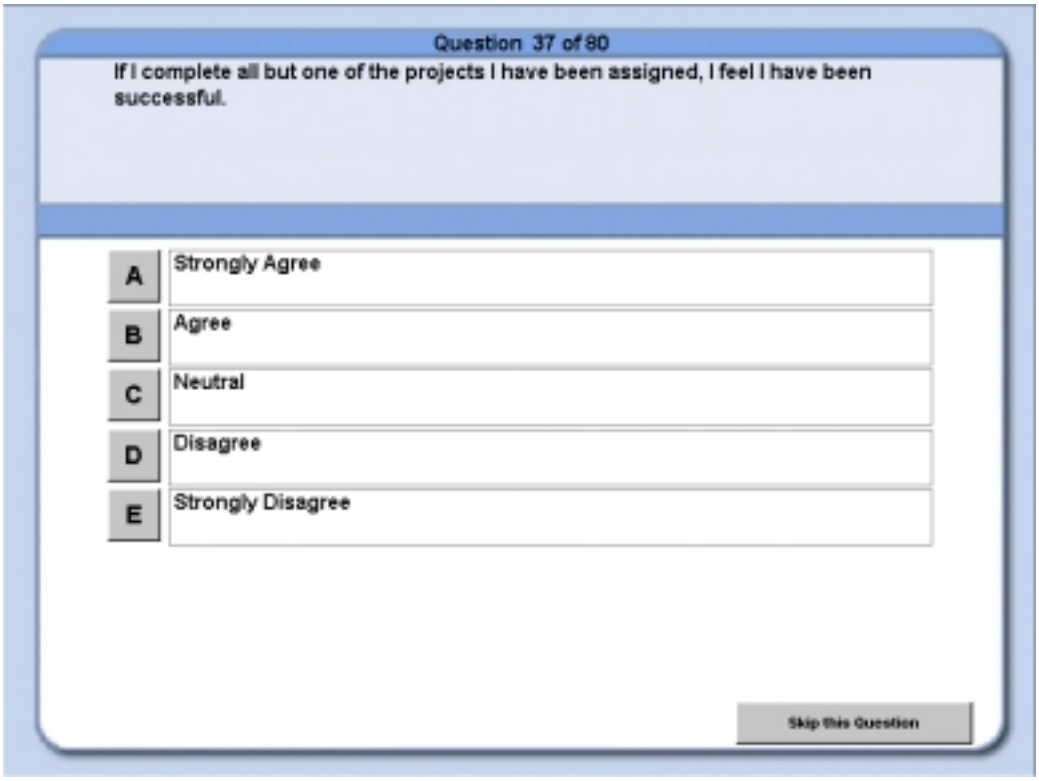


Test Name	Identity - Workplace Personality
Number of Questions	140
Type of Questions	Likert Scale (see sample questions)
Time Limit	Unlimited
Test Description	Finding the right fit between people and jobs is essential for employee satisfaction and organizational productivity. If the job requires frequent contact with customers and co-workers in a service environment, a helping disposition and team-player attitude are critical. If the job is fast-paced with frequently changing roles, then flexibility is important. SkillCheck's Identity-Workplace Personality assessment measures an individual's strengths and weakness on nine personality scales. The test can be used to select candidates, develop existing employees, or determine the managerial style that works best with an individual.
Scales Covered	**Ambition** - Ambition measures the degree to which the individual is likely to be competitive and driven to be the best. **Self-Confidence** - Self-Confidence measures the degree to which the individual is likely to be self-assured, is not overly affected by what others think of him/her, and is confident in his/her decisions and actions. **Assertiveness** - Assertiveness measures the degree to which the individual is likely to assert him/herself, speak his/her mind, and enjoy taking control (when appropriate) in group situations. **Flexibility** - Flexibility measures the degree to which the individual is likely to be able to adapt to change and be more open-minded than stubborn. **Helping Disposition** - Helping Disposition measures the degree to which an individual is friendly and is likely to go out of his/her way to assist or help customers and/or co-workers. **Reliability** - Reliability measures the degree to which the individual is likely to be dependable, hardworking, and conscientious about the quality of his/her work **Team Player** - Team Player measures the degree to which the individual is likely to cooperate in all aspects of his/her work relationships, including working in harmony with others to

	achieve a common goal. **Trustworthiness** - Trustworthiness measures the degree to which the individual is likely to be honest and trusting of others. **Stress Management** - Stress Management measures the degree to which this individual is likely to demonstrate patience and stress tolerance during times of conflict with customers and co-workers and in other stressful work-related situations. **Candidness** - Candidness measures the degree to which the individual is likely to be honest in his/her responses and is therefore not trying to outsmart the test in an effort to present him/herself in a more favorable light.

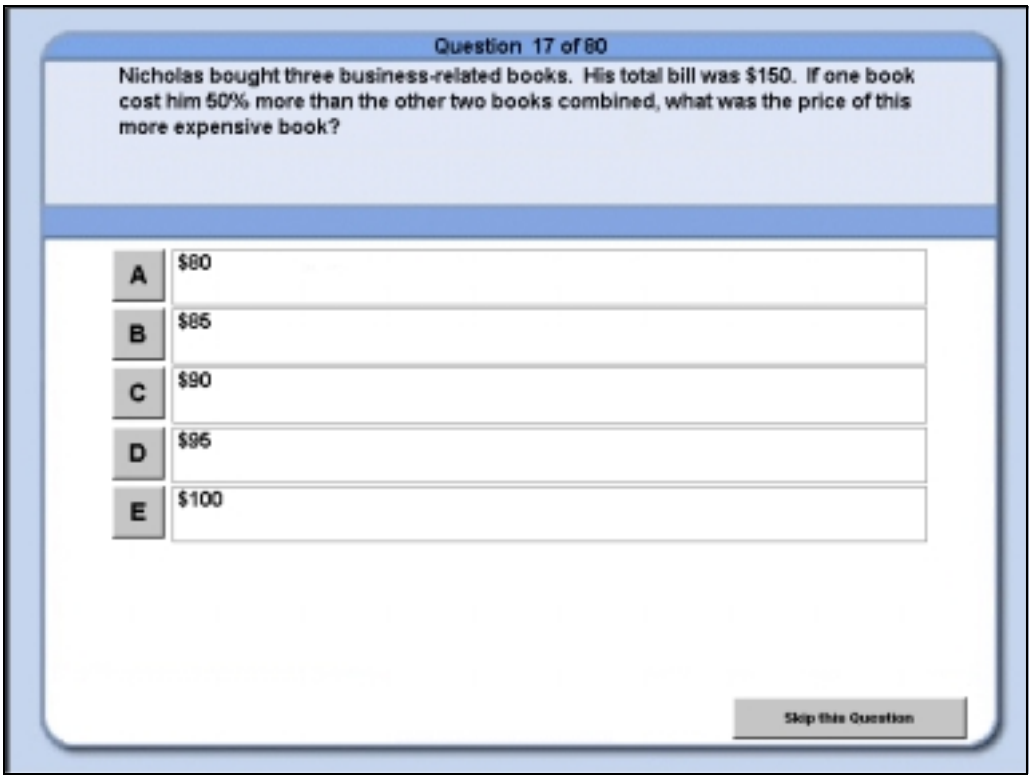
Sample Test Questions

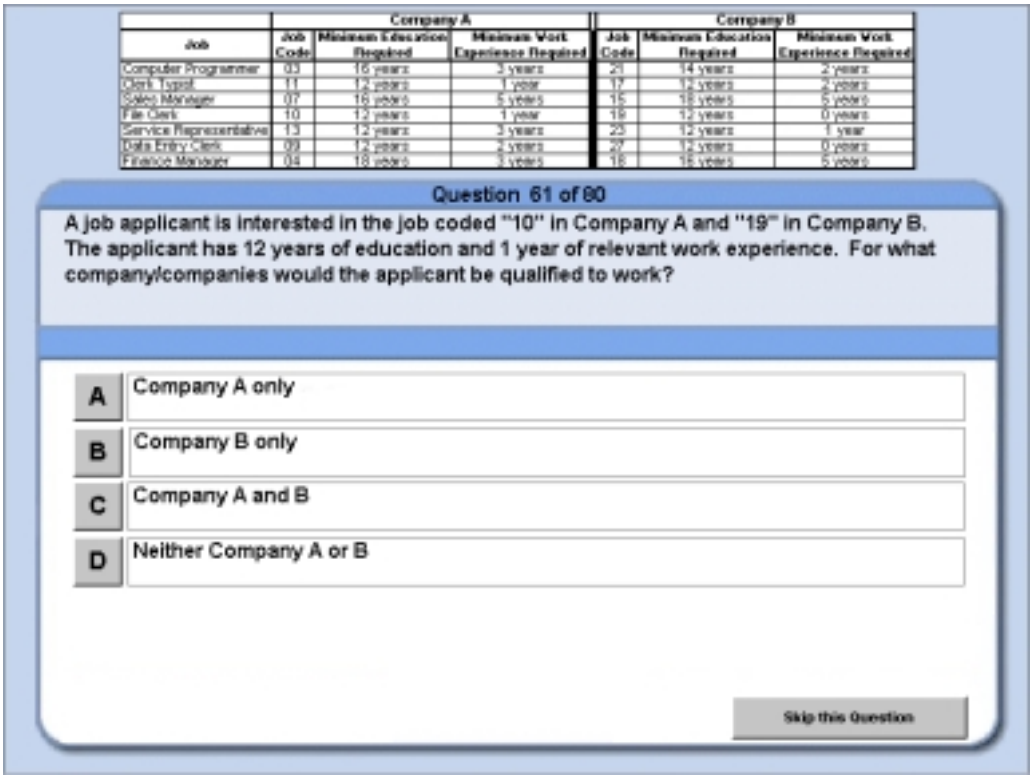




Test Name	Identity - Workplace Skills
Number of Questions	80
Type of Questions	Multiple Choice
Time Limit	Mathematical and Verbal Reasoning: 8 minutes Language Skills: 5 minutes Attention to Detail: 2 minutes Analyzing Skills: 10 minutes
Test Description	In today's fast-paced, dynamic work environment, employees must possess an array of basic skills that can be readily transferred from assignment to assignment. Employers who hire individuals with these skills and abilities will have the competitive advantage. SkillCheck's Identity-Workplace Skills assessment measures an individual's competencies with the basic skills required for most jobs, from entry-level through supervisory positions. These include reasoning, language, observation and analysis, and basic math skills. This test can be used as a selection tool or to determine whether additional training is needed.
Scales Covered	**Mathematical and Verbal Reasoning** - Mathematical and Verbal and Reasoning measures the degree to which this individual has the ability to learn quickly, solve problems, and understand basic mathematical concepts. **Language Skills** - Language Skills measures the degree to which this individual can quickly and accurately identify errors in word usage, punctuation, spelling, and capitalization. **Attention to Detail** - Attention-to-Detail measures the degree to which the individual can quickly and accurately compare two strings of letters and/or numbers much like tasks that involve verifying information. **Analyzing Skills** - Analysis measures the degree to which this individual can quickly and accurately answer questions by referencing information presented in the form of a table.

Sample Test Questions





SkillCheck Identity –Validity and Reliability Study
By Dr. Jesse Llobet, PhD

Development

With the rising costs associated with recruitment, training, poor job performance, counterproductive workplace behaviors and turnover, having a valid and reliable employee selection program in place could make the difference between an organization's success and failure. Research has consistently shown that pre-employment testing can be four times as effective as the job interview alone in predicting an applicant's future job performance.[4] Including professionally developed, job-related skills and personality tests within an organization's selection process can have a significant impact on employee performance, ultimately affecting the organization's bottom line.

The Identity series of tests were specifically developed to help today's organizations make the right hiring decisions. This comprehensive series is comprised of both skills and personality assessments that can be combined to offer a powerful, customized solution to any organization's specific hiring needs.

Each test within this series was specifically developed and validated for use within the business environment. The tests are founded on years of research. The test items were written based on extensive interviews with job incumbents, supervisors, managers, job observations, a review of training materials and a review of the psychological and skills testing literature. The original sets of test items were then validated using various validity methods (i.e., criterion-related, construct and self–report). Through extensive item analysis, the most valid and reliable test items were retained.

The following summarizes the concept of validity and the various validity methods utilized in validating the Identity series.

Validity

A test's level of effectiveness is directly related to its validity (the degree to which the test measures what it is supposed to measure) and its reliability (how consistent the test is at measuring what it is supposed to measure). The Identity series has undergone significant research across various job categories utilizing several validation strategies. The results of all the research conclude that the tests within the Identity series are valid predictors of various critical aspects of job performance. The three validation methods used to establish validity are summarized below.

[4] Hunter, J.E., & R.F. (1984). Validity and Utility of Alternative Predictors of Job Performance. *Psychological Bulletin*, 96, 72-96.

Criterion-Related Validation

The concurrent, criterion-related validation method requires that the test be administered to current employees. Performance data is then gathered on those employees. If the test were a valid predictor of performance, one would expect a statistically significant correlation between test scores and the performance data collected. In other words, those employees who score high on the test are the same employees that demonstrate high levels of performance. Those employees who do poorly on the test would likely be those that demonstrate poor performance.

The correlations obtained throughout all of the criterion-related validity studies that are presented in the Identity Validation Chart beginning on page 106 indicate that the Identity tests are valid predictors of job performance. As a point of reference, research has shown the average correlation of the standard job interview with job performance to be .14.

Construct Validation

In addition to the concurrent validation strategy described above, construct validation studies have been performed for many of the Identity tests. This validation strategy attempts to demonstrate the degree to which the instrument in question actually measures the psychological construct it is intended to measure. This approach generally involves administering the test in question along with another well-researched and established instrument that measures the same construct. If the two instruments measure the same construct, one would expect to find a significant correlation between the two. From the construct validation studies presented in the Identity Validation Chart beginning on page 106, we can conclude that the Identity tests do measure the construct they were designed to measure and therefore are construct valid.

Self-Report

An additional strategy utilized to establish the validity of the Identity series is that of comparing test scores to anonymous self-reports. Some tests measure behaviors that are not always observable yet could have a serious negative impact to your organization; for example stealing or illegal drug use. The anonymous self-report validation strategy makes it possible to collect past behavior information (e.g., stealing history, illegal drug use frequency) in a non-threatening manner. Test scores are then compared to the self-report ratings to determine the tests ability to identify those counterproductive behaviors. The results of the validation studies using the self-report data collection method offer strong support for the validity of the Identity tests that predict counterproductive workplace behaviors.

Reliability

In addition to the validity studies presented above, reliability analyses have been performed for each Identity test. Reliability refers to the degree to which the test items are consistent in measuring the skill or construct the test is intended to measure. The results of these analyses are presented in the Identity Validation Chart on the following pages. These results do, in fact, show that the Identity test items are consistent in measuring what they are intended to measure.

Appendix G - Specialized Testing Products

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Ambition	Ambition measures the degree to which the individual is likely to be competitive and driven to be the best. This characteristic is important for jobs where the attainment of established goals and benchmarks are important (e.g., sales jobs). It is also important for jobs where there may be competition within departments or between coworkers and positions where the individual is expected to grow and advance to higher levels within the organization.	Telesales/Inbound Sales	Criterion-Related	Supervisory Ratings	Sales Ability	0.31	0.83	95
		Managers	Criterion-Related	Supervisory Ratings	Overall Job Performance	0.45		40
		Individuals employed in a wide range of occupations including customer service reps., telesales reps., staff professionals, clerical staff, supervisors and managers.	Construct	NEO Personality Instrument - Achievement Striving Subscale (C4)	Achievement Striving Construct	0.57		111

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Ambition (continued)		College students enrolled in an introductory psychology class	Construct	NEO Personality Instrument - Achievement Striving Subscale (C4)	Achievement Striving Construct	0.42		93
		Male Collegiate Athletes	Criterion-Related	Coach's Ratings	Winning Attitude	0.24		231
					Commitment	0.26		232
					Intensity	0.28		231
					Mental Toughness	0.25		231
		Female Collegiate Athletes	Criterion-Related	Coach's Ratings	Winning Attitude	0.26		116
					Commitment	0.26		116
					Intensity	0.32		116
					Mental Toughness	0.24		116
Assertiveness	Assertiveness measures the degree to which the individual is likely to assert him/herself, speak his/her mind and enjoy taking control or the lead in group situations. This characteristic is important for jobs where a strong personality is a plus (e.g., most sales jobs and managerial positions).	Individuals employed in a wide range of occupations including customer service reps., telesales reps., staff professionals, clerical staff, supervisors and managers.	Criterion-Related	Supervisory Ratings	Assertiveness	0.36	0.81	102
		Outbound/Inbound	Criterion-	Supervisory	Sales Ability	0.23		90

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
		Sales	Related	Ratings				
Assertiveness (continued)		Customer Service Reps.	Criterion-Related	Supervisory Ratings	Self Confidence	0.49		24
					Assertiveness	0.57		24
					People Orientation	0.46		24
					Overall Job Performance	0.56		24
		Managers	Criterion-Related	Supervisory Ratings	Self Confidence	0.52		40
					Assertiveness	0.57		40
					People Orientation	0.34		40
					Overall Job Performance	0.32		40
		College Students	Construct	NEO Personality Instrument - Assertiveness Subscale (E3)	Assertiveness Construct	0.63		95
Drug Free Attitudes	Drug Free Attitudes measures the degree to which the individual is likely to be free of illegal drug use related problems that will affect his/her work. This characteristic is important for most jobs, but especially those involving the use a machinery or equipment where the safety of the	Employees in a variety of positions including entry level through managerial.	Self-Report	Anonymous Self-Report	In the last twelve months, number of times individual has used or taken illegal drugs at work.	-0.27	0.84	90

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
	employee and coworkers could be at risk.							
Drug-Free Attitudes (continued)					In the last twelve months, number of unexcused absences individual has had.	-0.35		90
					In the last twelve months, number of work-related rules/policies individual has not followed.	-0.27		90
		Employees in a variety of positions including entry level through managerial.	Self-Report	Anonymous Self-Report	In the last twelve months, number of times individual has used or taken illegal drugs at work.	-0.44		98

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
					In the last twelve months, number of unexcused absences individual has had.	-0.36		98
					In the last twelve months, number of work-related rules/policies individual has not followed.	-0.35		98
Helping Disposition	Helping Disposition measures the degree to which the individual is friendly and is likely to go out of his/her way to assist or help customers and/or coworkers. This characteristic is important for most, if not all jobs.	Employees in a variety of positions (i.e., computer programmers, engineers, secretary, office clerk, accounting clerk/bookkeepers, counselors, technicians, sales representatives, teachers, and managers)	Criterion-Related	Supervisory Ratings	Service Ability	0.27	0.75	51
					Flexibility	0.29		51
					Team Player	0.22		51
					Stress Management	0.26		51

Appendix G - Specialized Testing Products

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
					Overall Job Performance	0.33		51
		Employees in a law firm (e.g., lawyers, paralegals, clerical and customer service)	Criterion-Related	Supervisory Ratings	Service Ability	0.36		77
					Team Player	0.34		77
		Customer Service Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.59		25
					People Orientation	0.55		25
					Overall Job Performance	0.57		25
Helping Disposition (continued)		Customer Service Reps/Telesales Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.44		125
					Team Player	0.35		125
		College Students	Construct	NEO Personality Instrument - Agreeableness Scale	Agreeableness Construct	0.67		85

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Flexibility	Flexibility measures the degree to which the individual is likely to be able to adapt to change and is more open minded than stubborn. This characteristic is important for fast paced jobs where priorities often shift. It is also important for organizations that are in transition or are expecting changes that will affect work duties and responsibilities.	Individuals employed in a wide range of occupations including customer service reps., telesales reps., staff professionals, clerical staff, supervisors and managers.	Criterion-Related	Supervisory Ratings	Service Ability	0.34	0.76	106
					Team Player	0.37		106
					Flexibility	0.31		106
					Overall Job Performance	0.29		106
		College Students	Construct	NEO Personality Instrument - Compliance Subscale (O4)	Compliance Construct	0.37		122

Appendix G - Specialized Testing Products

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Non-Violence	Workplace Non-Violence measures the degree to which the individual is likely to respect others and would not engage in aggressive workplace behaviors such as intentionally damaging company property or resorting to physical or verbal threats. This characteristics is appropriate for most, if not all jobs.	Individuals employed in a wide range of occupations ranging from entry-level through managerial positions.	Self-Report	Anonymous Self-Report	In the past twelve months, how many times have you thought about hurting a coworker.	-0.36	0.89	109
					In the past twelve months, how many times have you threatened to hurt a coworker.	-0.21		109
					In the past twelve months, how many physical fights have you had at work.	-0.26		109
					In the past twelve months, how many times have you argued with a coworker or customer.	-0.24		109

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Non-Violence (continued)		Individuals employed in a wide range of occupations ranging from entry-level through managerial positions.	Self-Report	Anonymous Self-Report	In the past twelve months, how many times have you thought about hurting a coworker.	-0.38		83
					In the past twelve months, how many times have you threatened to hurt a coworker.	-0.47		83
					In the past twelve months, how many physical fights have you had at work.	-0.42		83
					In the past twelve months, how many times have you argued with a coworker or customer.	-0.34		83
Reliability	Reliability measures the degree to which the individual is likely to be dependable, hardworking and conscientious, and the degree to which he/she takes responsibility for his/her actions.	Customer Service Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.58	0.75	24

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Reliability (continued)					Conscientiousness	0.59		24
					People Orientation	0.62		24
					Attendance	0.59		24
					Overall Performance	0.72		24
		Employees in a variety of positions (i.e., computer programmers, engineers, secretary, office clerk, accounting clerk/bookkeepers, counselors, technicians, sales representatives, teachers, and managers)	Criterion-Related	Supervisory Ratings	Reliability	0.34		51
					Work Quality	0.31		51
					Overall Performance	0.35		51
		Managers	Criterion-Related	Supervisory Ratings	Service Ability	0.16		40
					People Orientation	0.35		40
					Attendance	0.14		40
					Overall	0.21		40

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
					Performance			
Reliability (continued)		Manufacturing employees (i.e., mechanic, forklift operator, equipment operator, shop foreman)	Criterion-Related	Supervisory Ratings	Safety	0.27		49
					Reliability	0.25		41
					Understanding Instructions	0.39		41
					Overall Performance	0.27		41
		Maintenance Employees	Criterion-Related	Supervisory Ratings	Service Ability	0.35		64
					Conscientiousness	0.32		64
					People Orientation	0.35		64
					Attendance	0.17		64
					Overall Performance	0.29		64
Rules Compliance	Rules Compliance measures the degree to which the individual is likely to follow company policies and adhere to rules and procedures established by management.	Various job categories (computer programmers, engineers, secretaries, office clerks, accounting clerks/bookkeepers, counselors, technicians, sales	Self-Report	Anonymous Self-Report	In the last twelve months, number of times individual has done something that his/her supervisor did not approve of.	-0.39	0.73	137

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Rules Compliance (continued)		representatives, teachers, and managers) from a variety of organizations.						
					In the last twelve months, number of times individual called in sick when he/she was not.	-0.27		137
					In the last twelve months, number of unexcused absences individual has had.	-0.23		137
					In the last twelve months, number of times individual has worked on personal matters at work.	-0.35		137
		Employees in a law firm (e.g., lawyers, paralegals, clerical and customer service)	Criterion-Related	Supervisory Ratings	Degree to which individual is honest and can be trusted	0.36		76

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Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Rules Compliance (continued)		Various job categories (computer programmers, engineers, secretaries, office clerks, accounting clerks/bookkeepers, counselors, technicians, sales representatives, teachers, and managers) from a variety of organizations.	Construct	NEO Personality Instrument - Conscientiousness Scale	Conscientiousness Construct	0.31		88
			Criterion-Related		Ability to Understand Instructions	0.35		51
					Reliability	0.26		51
					Attendance	0.23		51
					Overall Job Performance	0.26		51

Appendix G - Specialized Testing Products

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Self Confidence	Self Confidence measures the degree to which the individual is likely to be self assured, is not overly affected by what others think of him/her, and is confident in his/her decisions and actions. This characteristic is important for jobs that require independent thought, a self-starter attitude, sales and management.	Individuals employed in a wide range of occupations including customer service reps., telesales reps., staff professionals, clerical staff, supervisors and managers.	Criterion-Related	Supervisory Ratings	Stress Management	0.36	0.71	129
					Self Confidence	0.36		129
					Problem Solving	0.37		129
					Ambition	0.34		129
					Overall Job Performance	0.35		129
		Managers	Criterion-Related	Supervisory Ratings	Self Confidence	0.45		40
					Creativity	0.39		40
					Problem Solving	0.48		40
					Ambition	0.41		40
					Overall Job Performance	0.23		40
		College Students	Construct	NEO Personality Instrument - Competence Subscale (C1)	Competence Construct	0.42		95

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Self-Confidence (continued)				NEO Personality Instrument - Self-Consciousness Subscale (N4)	Self Consciousness Construct	-0.67		90
				NEO Personality Instrument - Assertiveness Subscale (E3)	Assertiveness Construct	0.47		92
		Customer Service Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.38		24
					Stress Management	0.42		24
					Self Confidence	0.41		24
					People Orientation	0.45		24
					Problem Solving	0.38		24
					Overall Job Performance	0.36		24
		Male Collegiate Athletes	Criterion-Related	Coach's Ratings	Winning Attitude	0.39		232
					Self Confidence	0.31		232
					Commitment	0.32		232
					Intensity	0.34		232
					Mental Toughness	0.31		232
					Overall Performance	0.26		232
		Female Collegiate Athletes	Criterion-Related	Coach's Ratings	Winning Attitude	0.25		123

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
					Self Confidence	0.22		123
Self Confidence (continued)					Commitment	0.21		123
					Intensity	0.21		123
					Mental Toughness	0.22		123
					Overall Performance	0.26		123
Stress Management	Stress Management measures the degree to which the individual is likely to demonstrate patience and stress tolerance during times of conflict with customers, coworkers and other stressful work-related situations. This characteristic is appropriate for jobs requiring interactions with customers, multi tasking and jobs in fast paced organizations to name a few examples.	Customer Service Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.23	0.85	174
					Stress Management	0.26		174
					Overall Job Performance	0.21		174

Appendix G - Specialized Testing Products

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Stress Management (continued)		Individuals employed in a wide range of occupations including customer service reps., telesales reps., staff professionals, clerical staff, supervisors and managers.	Criterion-Related	Supervisory Ratings	Service Ability	0.26		133
					Stress Management	0.31		133
					People Orientation	0.28		133
					Overall Job Performance	0.21		133
		Customer Service Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.49		24
					Stress Management	0.21		24
					People Orientation	0.57		24
					Overall Job Performance	0.54		24
		College Students	Construct	NEO Personality Instrument - Neuroticism Scale	Neuroticism Construct	-0.64		90

Appendix G - Specialized Testing Products

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Team Player	Team Player measures the degree to which the individual is likely to cooperate in all aspects of his/her work relationships including working in harmony with others to achieve a common goal. This characteristic is important for jobs requiring interaction and cooperation among coworkers.	Customer Service Reps.	Criterion-Related	Supervisory Ratings	Service Ability	0.52	0.71	24
					People Orientation	0.58		24
					Stress Management	0.46		24
					Overall Job Performance	0.57		24
		College Students	Construct	NEO Personality Instrument - Compliance Subscale (A4)	Compliance Construct	0.37		93
		Employees from a wide range of job categories including warehouse personnel, clerical staff, customer service, sales and management.	Criterion-Related	Supervisory Ratings	Service Ability	0.28		133
					People Orientation	0.25		133

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Team Player (continued)					Overall Job Performance	0.28		133
		Male Collegiate Athletes	Criterion-Related	Coach's Ratings	Winning Attitude	0.29		225
					Commitment	0.29		225
					Availability	0.28		225
					Dependability	0.29		225
					Team Player	0.32		225
		Female Collegiate Athletes	Criterion-Related	Coach's Ratings	Winning Attitude	0.18		122
					Commitment	0.31		122
					Availability	0.25		122
					Dependability	0.17		122
					Team Player	0.27		122
Trustworthi-ness	Trustworthiness measures the degree to which the individual is likely to be honest and trusting of others. This characteristic is important for most, if not all jobs with special emphasis jobs involving confidential or sensitive information.	Various job categories (computer programmers, engineers, secretaries, office clerks, accounting clerks/bookkeepers, counselors, technicians, sales representatives, teachers, and managers) from a variety of organizations.	Self-Report	Anonymous Self-Report	In the last twelve months, number of times individual has stolen from his/her employer.	-0.23	0.84	139

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Trustworthi-ness (continued)					In the last twelve months, number of times individual called in sick when he/she was not.	-0.28		139
					In the last twelve months, number of unexcused absences individual has had.	-0.26		139
					In the last twelve months, number of times individual has worked on personal matters at work.	-0.36		139
					In the last twelve months, number of times individual has done something behind supervisor's back.	-0.38		139
					In the last twelve months, number of times individual has done something that his/her supervisor did not approve of.	-0.28	0.84	139

Job-Related Personality Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Trustworthi-ness (continued)		Employees in a law firm (e.g., lawyers, paralegals, clerical and customer service)	Criterion-Related	Supervisory Ratings	Degree to which individual is honest and can be trusted	0.25		76
		Various job categories (computer programmers, engineers, secretaries, office clerks, accounting clerks/bookkeepers, counselors, technicians, sales representatives, teachers, and managers) from a variety of organizations.	Construct	NEO Personality Instrument - Conscientiousness Scale	Conscientiousness Construct	0.21		88

Job-Related Aptitude Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Analyzing	Analyzing measures the degree to which the individual can quickly and accurately refer to information presented in the form of a table and answer questions related to that information. This characteristic is appropriate for jobs requiring looking up information on computer screens, spreadsheets or charts. Most clerical jobs require some degree of this ability.	Customer Service Reps.	Criterion-Related	Supervisory Ratings	Reading Skills	0.29	0.78	90
					Following Directions	0.24		90
					Writing Skills	0.29		90
					Math Skills	0.27		90
					Analyzing Data Skills	0.26		90
					Overall Performance	0.22		90
		Clerical Staff	Criterion-Related	Supervisory Ratings	Attention to Detail	0.25		83
					Filing Ability	0.36		83
					Math Skills	0.44		83

Job-Related Aptitude Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
					Analyzing Data	0.28		83
Analyzing (continued)					Proofing Skills	0.34		83
					Overall Performance	0.35		83
Attention to Detail	Attention to Detail measures the degree to which the individual can quickly and accurately compare two strings of letters and/or numbers much like tasks that involve verifying information. This ability is important for most clerical jobs. It is also appropriate for jobs that require proofing tasks.	Clerical Staff	Criterion-Related	Supervisory Ratings	Proofing Skills	0.42	0.73	77
					Filing Ability	0.26		77
					Analyzing Data Skills	0.22		77
					Overall Performance	0.32		77
		Clerical Staff, Customer Service Reps. and Telesales Reps.	Criterion-Related	Supervisory Ratings	Detail Orientation	0.26		128
					Proofing Skills	0.21		128
					Learning Ability	0.24		128

Job-Related Aptitude Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Attention to Detail (continued)					Understanding Instructions	0.27		128
					Problem Solving	0.25		128
					Overall Performance	0.31		128
Language Skills	Language Skills measures the degree to which the individual can quickly and accurately identify errors in word usage, punctuation, spelling and capitalization. This ability is important for most clerical positions, particularly positions requiring writing and/or proofing.	Clerical Staff	Criterion-Related	Supervisory Ratings	Writing	0.25	0.76	50
					Analyzing Data Skills	0.23		50
					Overall Performance	0.27		50
		Clerical Staff, Customer Service Reps. and Telesales Reps.	Criterion-Related	Supervisory Ratings	Detail Orientation	0.32		128
					Proofing Skills	0.41		128
					Learning Ability	0.35		128

Appendix G - Specialized Testing Products

Job-Related Aptitude Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
					Understanding Instructions	0.29		128
Language Skills (continued)					Problem Solving	0.37		128
					Overall Performance	0.42		128
Math and Logical Reasoning	Math and Reasoning measures the degree to which this individual has the ability to learn quickly, problem solve and understand basic mathematical concepts. This ability is appropriate for most, if not all, jobs.	Various job categories (computer programmers, engineers, secretaries, office clerks, accounting clerks/bookkeepers, counselors, technicians, sales representatives, teachers, and managers) from a variety of organizations.	Criterion-Related	Supervisory Ratings	Learning Ability	0.41	0.79	78
					Problem Solving	0.44		78
					Ability to Understand Instructions	0.24		78
					Overall Performance	0.39		78

Appendix G - Specialized Testing Products

Job-Related Aptitude Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
		Call Center Reps. and Sales Associates	Criterion-Related	Supervisory Ratings	Learning Ability	0.24		73
					Problem Solving	0.21		73
Math and Logical Reasoning (continued)					Ability to Understand Instructions	0.23		73
					Overall Performance	0.24		73
		Employees in a law firm (e.g., lawyers, paralegals, clerical and customer service)	Criterion-Related	Supervisory Ratings	Learning Ability	0.24		72
					Level of Education	0.58		72
		Sales Associates	Construct	Wonderlic Personnel Test	Intelligence Construct	0.73		23
Cognitive	The Cognitive score is a general indicator of the individual's ability to problem solve and to think quickly. It is also a valid indicator of his/her training potential.	Employees from a wide range of job categories including clerical staff, customer service, sales and management	Construct	Wais-R IQ Test	IQ	0.81	0.77	70

Appendix G - Specialized Testing Products

Job-Related Aptitude Scales - Validation Information								
Scale	**Description**	**Sample Description**	**Validation Method**	**Criteria Format**	**Criteria Measured**	**Validity**	**Reliability**	**Sample Size**
Cognitive (continued)		Employees from a wide range of job categories including warehouse personnel, clerical staff, customer service and sales.	Self-Report	Anonymous Self Report	Educational Level	0.37		122
		College Students	Construct	Wonderlic Personnel Test	Intelligence Construct	0.75		86
		Employees from a wide range of job categories including warehouse personnel, clerical staff, customer service, sales and management.	Criterion-Related	Supervisory Ratings	Average validity across various cognitive tasks (e.g., reading, writing, math)	0.31		75
		College Students	Self-Report	Anonymous Self Report	GPA	0.35		28

Sample Identity Report

Testing Results

Test information

Identity - Risk Free
John Smith 000-00-0000
10/1/03 10:33 AM 18 minute(s)

Performance Analysis

	0 50 99	Percentile	Grade
Overall Performance		56	Average
Performance Area		**Percentile**	**Grade**
Trustworthiness		79	Above Avg.
Rules Compliance		91	High
Reliability		14	Low
Non-Violent Attitude		71.	Above Avg.
Drug-Free Attitude		25	Below Avg.

Candidness	The candidate displayed a High level of candidness when answering questions in this test.

Detailed Descriptions of Results

Overall Performance

Description: Workplace risk comes in many forms. A job candidate's attitude towards drug use and the inappropriateness of aggressive or even violent behavior are important measurements of the risk he or she might bring to the workplace

environment. Similarly, a job candidate's trustworthiness, reliability and willingness to follow the rules will impact the level of risk they can bring to a place of employment. The following measures provide insight into the candidate's attitudes in these five critical areas.

The overall Risk Free score is a general indicator of the individual's propensity to engage in inappropriate workplace behaviors as defined by the scales included in this battery. For more specific insights, please review the individual scale results.

Score Percentile: 56: This candidate scored higher than 55% of other candidates. (Average Performance)

Description This individual's overall risk free score is within the average range. While some individual's that score in this range are unlikely to engage in inappropriate workplace behaviors, others that score in this range, may have some trouble in this area. A more thorough investigation - including in-depth interviewing, more extensive reference and background checks, and drug testing - may be recommended for this individual.

Performance in Each Area

Trustworthiness

Score Percentile: 79: This candidate scored higher than 78% of other candidates. (Above Average Performance)

Description Trustworthiness measures the degree to which the individual is likely to be honest and trusting of others. This characteristic is important for most, if not all jobs with special emphasis on cash handling jobs and jobs involving confidential or sensitive information.

This individual's trustworthiness score suggests that he/she is honest and trusting. Most people in the study sample scored lower on trustworthiness than this individual.

Rules Compliance

Score Percentile: 91: This candidate scored higher than 89% of other candidates. (High Performance)

Description Rules Compliance measures the degree to which the individual is likely to follow company policies and adhere to rules and procedures established by management. This characteristic is appropriate for most, if not all jobs, with special emphasis on jobs requiring handling money (such as a bank teller or cashier) and positions related to security (such as a security guard or police officer).

This individual's rules compliance score is superior to that of most other people in the study sample. It is very likely this individual will follow company policies and will adhere to rules and procedures established by management. This does not appear to be an area of concern for this individual.

Reliability

Score Percentile: 14: This candidate scored higher than 13% of other candidates. (Low Performance)

Description Reliability measures the degree to which the individual is likely to be dependable, hardworking, and conscientious about the quality of his/her work. This characteristic is appropriate for all jobs.

This individual's reliability score is extremely low when compared to people from the study sample. It is likely that individuals that score in this range will have trouble with respect to being dependable, hardworking and conscientious about the quality of their work. This seems to be an area of weakness for this individual. It is highly recommended that much more in depth interviewing, reference and background checks be performed for this individual.

Non-Violent Attitude

Score Percentile: 71: This candidate scored higher than 70% of other candidates. (Above Average Performance)

Description Workplace Non-Violence measures the degree to which the individual is likely to respect others and not engage in aggressive workplace behaviors such as intentionally damaging company property or resorting to physical or verbal threats. This characteristic is appropriate for most, if not all jobs.

This individual's non-violence score suggests that he/she is likely to respect others and would not engage in aggressive workplace behaviors such as intentionally damaging company property or resorting to physical and verbal threats. Most people in the study sample scored lower in this area.

Drug-Free Attitude

Score Percentile: 25: This candidate scored higher than 24% of other candidates. (Below Average Performance)

Description Drug-Free Attitudes measures the degree to which the individual is likely to avoid illegal drug use and related problems that might impact work. This characteristic is important for most jobs, but especially for those involving the use of machinery or equipment where the safety of the employee and coworkers could be at risk.

This individual's drug-free attitudes score is below average when compared to people from the study sample. Having an illegal drug use problem that can affect his or her work may be more likely for this individual than for those scoring higher. A more thorough investigation - including in-depth interviewing, more extensive reference and background checks, and drug testing - is recommended for this individual.

Candidness

Score High

Description Candidness measures the degree to which the individual is likely to be honest in his/her responses and is therefore not trying to outsmart the test in an effort to present him/herself in a more favorable light.

This individual obtained a high candidness score, suggesting there is a very high probability he/she answered the test questions honestly. The candidate's responses are likely to be an accurate representation of his/her attitudes and behaviors.

Interview Suggestions

The following suggestions for interview questions can provide useful follow up in areas where the candidate's test performance indicates that further exploration is recommended.

Trustworthiness

- From your experience, can coworkers generally be trusted? Please give examples to support your response.
- Have you generally gotten along well with coworkers or have there been some unpleasant situations? Please explain.
- Do you think it is natural to want to steal something from somewhere or someone? How can one overcome those tendencies? Please give examples.
- What justification might there be in a business environment for not being totally honest?

Rules Compliance

- Have you ever been terminated from a job? Can you please explain the situation?
- How important do you feel company policies and procedures are? Please explain your answer.