Light Industrial Skills Test

L.I.S.T.

HR•Assessments®

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Administrator's Manual

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To ensure that you are obtaining the full benefits available to you from the use of HR•Assessments® products, please read all information contained in this manual carefully. By using this assessment product, you are acknowledging that you have read and understand the general guidelines provided in this manual, and that if you have any specific questions, you have referred them to a competent testing and/or legal expert for advice. The test developer and publisher do not assume liability for any unlawful use of this product.

The test developer and publisher do not assume any responsibility for the employer's use of this test or any decision the employer makes which may violate local, state or federal law. By selling this test, the publisher is not giving legal advice.

While HR•Assessments® are designed to help predict various aspects of human behavior, score results are presented in terms of probabilities. False Positives and False Negatives are expected. EDI and the test developer are not liable for test taker, applicant or employee behaviors.

Testing Products: An Investment in Your Company's Future

The decision to use testing products in the employment process is one that can be very beneficial to your company in many ways. A well-designed, properly validated test, when used in conjunction with other employment screening tools, can save your company from investing training resources in an applicant who is not suited to perform the job for which he or she was hired, and, as a consequence, can help protect your company from negligent hiring lawsuits.

Each test has been researched and developed by our staff of testing professionals, which includes experienced industrial psychologists.

Use of Testing Products as "Tools"

Validity studies of the testing products we offer have shown them to be predictive of job performance and therefore quite useful during the selection process. It is important to remember that tests should be utilized in conjunction with other, equally important employment screening tools such as criminal background checks, work histories and employer references–to present a balanced picture of the particular job candidate. Only when used in coordination with each other will you be able to truly determine a "fit" between the candidate and the particular job for which he or she is applying.

Employment tests, as defined in this manual, can be of several different varieties, including trustworthiness or integrity tests, skills-oriented tests and personality tests. Each test can focus on one of these elements, or may include several different components, testing a variety of factors. Choosing the proper test product for your needs is a key factor in making your selection process more effective.

Legal Aspects of Test Use and Administration

Although employment tests have been in use for more than 40 years, their use became more prevalent after the passage of the Employee Polygraph Protection Act (EPPA) of 1988, which made it illegal for most private employers to use polygraph examinations as a routine pre-employment screening tool. Employment tests which are not prohibited by the EPPA are designed to give the employer a legal way to gauge an employee's job-related skills and personality traits as an alternative to the polygraph test. Whereas the polygraph test is designed to monitor an applicant's physiological reaction to certain questions, the employment tests seek to gain information on the job candidate through a series of questions designed to measure certain job-related attributes.

Today, the use of employment tests continues to increase. Many of the country's largest corporations use these types of screening devices on a regular basis and have found great success in using them to hire and promote the best candidates.

Testing Products and "Adverse Impact"

A common misperception of these tests is that they all tend to discriminate against certain classes of applicants, in violation of state and federal laws against discrimination in employment decisions. In fact, this is not the case. While there is evidence of poorer test performance by some members of protected classes on some skills tests that include language and mathematical components, the use of such tests is still justified as long as the skills assessed by the test are essential for the successful performance of one or more of the job's key functions. In addition, researchers have found no evidence that well-constructed personality tests discriminate on any unlawful basis.

However, it is incumbent upon employers who use test products to constantly monitor selection procedures to ensure that no "adverse impact" is occurring in the overall selection process. Adverse impact is defined as a situation in which there is a substantially different rate of selection in hiring, promoting or other employment decisions that works to the disadvantage of members of a race, sex or ethnic group. If adverse impact does occur, the employer needs to be able to demonstrate the job relatedness of the selection process. For further guidance in this area, read the Test Selection and Follow-Up Procedures section of this manual.

Federal Laws

There are federal laws and regulations governing the use of "selection" tools – such as employment tests – insofar as they have any "adverse impact" on the employment opportunities of protected classes of individuals. Some of the more subtle aspects of these laws as they apply to the selection process are discussed in the section of this manual entitled *Using Job Analysis to Justify Use of Test and Its Sections (Legal Implications).*

Title VII

Title VII of the Civil Rights Act of 1964 (Title VII), covering employers with 15 or more employees, prohibits discrimination in employment decisions on the basis of race, sex, color, religion and national origin. Title VII authorizes the use 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" on any unlawful basis. In 1971, the United States Supreme Court, in Griggs v. Duke Power Co. (401 U.S. 424), adopted the standard that employer practices that had an adverse impact on minorities and were not justified by a business necessity violated Title VII. Congress amended Title VII in 1972, adopting this legal standard.

As a result of these developments, the government sought to produce a unified governmental standard on the regulation of employee selection procedures because the separate government agencies had enforcement powers over private employers and each used different standards. This resulted in the adoption of the Uniform Guidelines on Employee Selection Procedures (Guidelines), codified at 29 CFR Part 1607, which establishes a uniform federal position in the area of prohibiting discrimination in employment practices on the grounds of race, color, religion, sex or national origin, and applies to all public and private employers covered by Title VII, Executive Order 11246, the State and Local Fiscal Assistance Act of 1972, the Omnibus Crime Control and Safe Streets Act of 1968, and the Intergovernmental Personnel Act of 1970.

Highlights of the Guidelines include:

Provision of a uniform set of principles governing use of employee selection procedures that is consistent with applicable legal standards.

Setting out validation standards for employee selection procedures generally accepted by the psychological profession.

The Guidelines do not require a validation of the selection device unless there exists evidence of adverse impact. It is important to note also that compliance with the Guidelines does not remove the affirmative action obligations for test users, including federal contractors and subcontractors.

The Americans with Disabilities Act

The Americans with Disabilities Act (ADA) provides that an employer "shall not conduct a medical examination or make inquiries of a job applicant as to whether such applicant is an individual with a disability or as to the nature or severity of such disability." (42 USC Sec. 12112(d)(2)(A); see also 29 CFR Sec. 1630.13.) Inquiries into a person's disabilities are prohibited at the pre-offer of employment stage, except in a very narrowly defined situation where the applicant has voluntarily disclosed a medical condition requiring accommodation. The ADA protects disabilities, not a characteristic which an employer may consider to be a personal flaw or undesirable aspect of an applicant's personality. The ADA does not prohibit inquiries into such personality attributes as propensity for honesty, ability to get along with others, organizational skills or management skills, to name a few examples. No question or series of questions designed to elicit information about a person's mental impairment (as defined by the ADA), or questions which would even tend to elicit such information, should appear on a testing product. Each HR•Assessments® product has been carefully reviewed under this standard, in order to avoid any conflict with the ADA guidelines.

Recordkeeping Requirements

Various federal laws require employers to retain tests and test results for at least one year from the date the test is administered or from the date of any personnel action relating to the testing, whichever is later.

State and Local Laws

Due to the wide variety, complexity and ever-changing nature of state laws, it is impossible to summarize each state's requirements in this brief overview. If you are unfamiliar with the state laws governing the use of screening devices applicable in your locale, consult with a qualified labor law attorney or testing specialist who may provide competent guidance on this topic.

Test Selection and Follow-Up Procedures

Selection

Generally, when selecting a test or any other selection tool, you should choose one that has been specifically designed to measure the skills or traits necessary for the position in question. It is recommended that a thorough job analysis be performed to determine the links between job functions and the attributes the testing product is designed to measure.

Monitoring

Monitor your selection process to ensure compliance with all applicable federal, state and local laws, checking your selection process for evidence of adverse impact. This should be conducted on a continual basis. HR•Assessments® testing products include testing logs that can be used to record each test taker's scores, as well as other important data that may be used to compute your own test norms and adverse-impact statistics.

Validation

Should your monitoring results indicate that adverse impact is occurring in the selection procedures, you should determine in which component of the selection process this is happening. If the use of a particular testing product is found to be the cause, you will need to conduct a validation study. Qualified testing professionals may be contacted to help in conducting a validity study. These professionals will be able to help determine if the test is the cause of the adverse impact and whether or not the test is focusing on a bona fide occupational qualification for the job. In some instances, tests that in some contexts may be considered discriminatory may be lawful to use in others, as long as the test is focusing on a bona fide occupational qualification.

Scoring

Cut-offs and suggested "pass" or "fail" scores are not provided with these tests. Instead, norms and, in some instances, average test scores for various levels of job performance are provided. This information is provided for the elements the test is designed to measure. This information is a result of the testing universe used in the validation studies performed by the developer and is for demonstrative purposes only. Test results should always be interpreted, along with other information gathered through your selection process, to ensure that you get a complete picture of the job candidate or employee. It is recommended that you administer the test to your current employees, so that you may develop your own company-specific norms for test performance. These norms can then be used as benchmarks during your testing and selection process.

The Importance of Testing for a Light Industrial Position

When choosing an employee for a warehouse, assembly or light manufacturing position, the most important factors to consider are: basic skills, inspection and assembly skills, reliability and safety.

Your employees must have basic math and reasoning skills for almost everything they do, from properly filling orders to handling shipping and receiving. Inspection and assembly skills are essential in order to guarantee that your customers receive quality products without any defects or missing parts. Your employees must be reliable, show up for work on time and take responsibility for the quality of their work. Most importantly of all, in a warehouse environment, your employees must have a safe work ethic, which includes a drug-free lifestyle.

The HR•Assessments® Light Industrial Skills Test (L.I.S.T.) measures all of these critical skills and attitudes in one comprehensive test:

1. **Math and Reasoning Skills –** An employee working in the warehouse or performing light industrial duties needs math and reasoning skills for every aspect of his/her job, including performing cycle counts, product counts, physical inventories, and general shipping and receiving. For example, if a container weighs 4 pounds and there is a 34-pound limit per shipment, your employee should be able to figure out how many containers can be included per shipment.

2. **Inspection Skills –** Section Two of the L.I.S.T. presents your applicant with ten rows of items and your applicant must quickly decide which items are different from the perfect sample. This measures their ability to spot product defects quickly and accurately.

3. **Assembly Skills –** In Section Three, your applicant is presented with scattered components which they must visually put together to form a finished product. This measures their ability to follow instructions to properly assemble a product.

4. **Workplace Attitudes –** Because there are so many safety hazards in a warehouse setting, including heavy machinery, sharp tools and dangerous chemicals, it is imperative for all of your employees to be drug-free. The L.I.S.T. helps you objectively and in a non-threatening manner, obtain an individual's opinions on illegal drug use. Plus, the L.I.S.T. also measures your applicant's reliability, which includes their opinions on attention to detail, quality of work and dependability.

The L.I.S.T. is also a powerful interviewing tool. You can use the applicant's responses to specific test items in the Workplace Attitudes section to generate follow-up interview questions that further assess their skills and behavioral tendencies.

Your company's success depends on the soundness of your hiring decisions, and the risk of an unskilled and unsafe employee is too great to ignore. Incorporating the Light Industrial Skills Test into your selection process should significantly increase your hiring accuracy and provide an effective means of maintaining workplace safety.

Description of the L.I.S.T.

The L.I.S.T. provides a reliable measurement of the basic skills and workplace attitudes required of most warehouse and/or manufacturing positions (i.e., math and reasoning, inspection, assembly, illegal drug use attitudes and reliability). Administration of the entire test should take less than 30 minutes. The test is broken down into four sections as follows:

1. **Math and Reasoning Skills –** 20 multiple-choice questions focusing on job-related situations that require basic math skills and the ability to think logically and reason in an efficient and accurate manner. Time: 10 minutes.

2. **Inspection Skills –** The applicant is required to compare objects to a perfect sample and identify those objects that are defective. Ten rows of objects are presented. Time: 2 minutes.

3. **Assembly Skills –** The applicant is presented with ten unassembled objects. Their task is to mentally assemble them and circle the choice that best represents what the assembled object should look like. Time: 5 minutes.

4. **Workplace Attitudes –** 40 attitude-based behavioral statements, 20 concentrating on illegal drug use attitudes and 20 on reliability. The applicant is asked the extent to which he/she agrees or disagrees with each statement. Although this section is not timed, it can usually be completed in less than 15 minutes. Validation studies have found these scales to be predictive of self-reports regarding workplace illegal drug use and supervisory ratings of on-the-job reliability.

One of the primary advantages of the L.I.S.T. is its ease of administration and scoring. Quick and clear scoring procedures make the test accessible to all types of businesses regardless of the size or the industry. Test administration is accomplished in a short period of time without sacrificing the test's technical qualities (e.g., reliability, validity).

The L.I.S.T. should provide a significant return-on-investment for its users. A comparison of the cost of this test and the hidden costs associated with the recruitment and promotion of ability-deficient applicants will reveal that personnel testing is cost-effective. The training and time investment in employees who turn out to be unqualified represent a very significant hidden cost.

Using Job Analysis to Justify Use of Test and Its Sections (Legal Implications)

From a legal standpoint, if a test is to be used for selection or promotion purposes, it is important that users of the test take the necessary steps to establish a clear linkage between the job tasks and the occupational environments measured by the test. This relevancy should exist to meet the principles outlined in the Uniform Guidelines on Employee Selection Procedures (1978) and other federal government employment-related legislation, such as Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1991, and the American with Disabilities Act of 1990.

The tasks that are crucial or essential to the job in question should first be identified. Then, the occupational environment that matches the job in question can be determined. This process should be carefully documented to justify the appropriateness of the test administered in the employee selection process.

The following are examples that indicate the relationship between job tasks and the occupational environments described in this manual:

Task	Section
Counts items in inventory and based on consumption rates determines reorder amounts.	Math and Reasoning
Inspects finished products for defects before preparing them for shipment.	Inspection
Assembles products based on specific assembly instructions.	Assembly
Consistently performs all job tasks as specified with little or no supervision.	Reliability
Operates forklift in a safe and proper manner.	Illegal Drug Use Attitudes

As a general guideline for compliance with federal discrimination and disability laws, test users should not subject test takers to any adverse employment decision based on a test result, unless the test result and other factors considered in the decision-making process reveal that the person does not possess qualifications that are crucial or essential to the job in question. To illustrate, if a test taker performs poorly on a test section designed to measure inspection skills, and inspection skills are not crucial or essential to the position for which the test taker is being considered, the test result should not serve as a basis for excluding the test taker from the position. Similarly, if a test result indicates that a test taker is unable to perform certain physical tasks that are not crucial or essential to the job position at issue, the test taker should not be excluded from that position on the basis of the test result.[1] Test users can avoid this type of scenario altogether by carefully identifying the tasks that are essential to the job position at issue, and administering only those tests or test sections that are appropriate and relevant to the position's requirements.

Test sections measuring proficiency in the English language also should be administered in accordance with these principles. Thus, if spelling, grammar, vocabulary, or reading comprehension skills are not essential to a job position, a test taker should not be subjected to an adverse employment decision based on poor test results in those areas. Requiring employees or applicants to be fluent in English may constitute national origin discrimination in violation Title VII of the Civil Rights Act if the requirement is not justified by business necessity or directly related to job performance. There are some limited exceptions to this rule for jobs involving dangerous work requiring a heightened understanding of written or verbal safety instructions in English, or service positions that require significant communication in English with the public. Test users should consult with an attorney before subjecting any test taker to an adverse employment decision on the basis of English language deficiencies.

[1] If the test taker's ability to perform a particular physical task is essential to the job position at issue, the Americans with Disabilities Act may require the test user to provide certain accommodations to facilitate the test taker's performance of the task at issue. Test users should consult an attorney before making any adverse employment decision based upon a test taker's physical inability to perform a task measured by a test result.

Administration Instructions for Paper Tests

Please read these instructions before administering the L.I.S.T.

If you are using the software version of this test, please refer to the software's technical manual for complete administration and scoring instructions.

1. Decide on the number and kinds of assessment instruments to be used in evaluating applicants or employees. The L.I.S.T. may be one of them. Other valuable evaluation instruments may be the application form, an employment interview, reference checks and other tests.

2. Decide beforehand on the sections of the test to be administered. Make sure to select only job-related sections as described in the previous section of this manual entitled *Using Job Analysis to Justify Use of Test and Its Sections.*

3. Before testing, be familiar with the test and its instructions. Be prepared to answer any questions that may be asked.

4. The test should be administered in a quiet room, free from distractions and interruptions.

5. Provide each test taker (applicant or employee) with a ballpoint pen to ensure clear markings on the answer sheets. Instruct them to press firmly when marking their answers.

6. Distribute the test and have the test taker complete the information on the front cover (i.e., name, Social Security number and date).

7. Introduce the test to the test taker. Say, "This test is designed to evaluate the basic skills required by the job. There are four sections, each concerned with a different type of job-related skill or behavior. The test sections are titled Math and Reasoning, Inspection, Assembly and Workplace Attitudes." If the test taker is not taking all of the sections of the test, point out to him/her the sections to be taken.

   Test users who are subject to the Americans with Disabilities Act of 1990 may be required to provide accommodations to disabled test takers who need assistance during the testing process. This may include, for example, relaxing the time limitations of timed tests, offering visual or audio assistance, or providing special lighting or seating arrangements. Test users who are uncertain of their obligations under the Americans with Disabilities Act should consult an attorney if an accommodation is requested in the testing process.

8. Have the test taker (applicant or employee) read the instructions for the first section you are going to administer (e.g., Math and Reasoning). The test taker should read only the instructions. Do not let the test taker read any of the other sections' actual questions!

9. Time the Math and Reasoning, Inspection and Assembly sections according to the time specified in the test instructions. When a test taker's time for a section is up, say, "Stop!" Do not let the test taker answer any more questions in that section. After these timed sections have been completed, have the applicant fold the test so that only the Workplace Attitudes section is showing. They can then proceed to answer the questions in this section. Although the Workplace Attitudes section, which includes the Reliability and Illegal Drug Use Attitudes Scales, is not timed, most applicants should be able to complete it within 15 minutes. Applicants should not be allowed to go back to the timed sections and complete unanswered questions or make changes to answers in these sections.

10. When they are done with all sections, ask test takers to turn in their tests and say, "Thank you. We appreciate your time."

Scoring Instructions for Paper Tests

Scoring the L.I.S.T. is straightforward and time-efficient. Simply follow the steps listed below:

1. Open the test and tear off the perforated tab on the right-hand side of the test. Carefully separate the test cover from the answer sheet.

2. For the Math and Reasoning section, the correct answers appear preprinted on the key. Therefore, a response is correct when the applicant has circled the preprinted answer on the key. If an applicant circles more than one answer for one question, the answer is incorrect and should not be counted. To obtain this section's score, count the number of correct responses and write the total in the score box provided at the end of the section.

3. The Inspection section also has the correct answers preprinted on the answer key. A response is correct when the applicant has circled the preprinted images on the key. Please note that in this section there may be up to three correct answers for each question. Count the number of correct responses. If there are objects circled that are not defective, subtract these from the number of correct responses. Write this total in the score box provided at the end of the section.

4. The Assembly section also has the correct answers preprinted on the answer key. A response is correct when the applicant has circled the preprinted images on the key. However, for this section there is only one correct answer for each question. If an applicant circles more than one answer for one question, the answer is incorrect and should not be counted. Count the number of correct responses and write the total in the score box provided at the end of the section.

5. Notice that the Workplace Attitudes section is separated into four parts. The top part (questions 1 to 10) and the third part (questions 21 to 30) correspond to the Reliability Scale. The second part (questions 11 to 20) and the last part (questions 31 to 40) correspond to the Illegal Drug Use Attitudes Scale.

   The applicant's answers should appear as circles on the carbonless key. There are no "correct" or "incorrect" answers for this section of the L.I.S.T. The score for each individual Scale is determined by adding up all the point values circled by the applicant for the items within that Scale.

   For example, to determine an individual's score on the Reliability Scale, add the circled numbers for items 1 to 10 and write this number in the box along the right side of the key marked with an R1. Then add the circled numbers for items 21 to 30 and write this number in the box marked with an R2. Follow the instructions at the bottom of the page and add boxes R1 and R2 to obtain the Reliability Score. Write this number in the space provided. Use the same process to obtain the score for the Illegal Drug Use Attitudes Scale. Add the scores for R1, R2, D1 and D2 to obtain the total Workplace Attitudes Scale score.

6. To calculate the total L.I.S.T. score, divide the sum of the Reliability and Illegal Drug Use Attitudes Scale scores by 10 and add it to the Math and Reasoning, Inspection Skills and Assembly Skills section scores. Write this score in the total score box on the front of the test.

Administration Instructions for Web-based Tests

Please read the following instructions before administering this test.

To access the Online Testing website:
Make sure to be using Internet Explorer to access the site

1. Open your web browser and go to **http://www.mytests.hrdirect.com**

2. Click **Administrator Login**

3. Enter the user name and password we've provided you via e-mail.

Step 1 – Create applicant(s)
It is important that you complete this step first as most of the other screens will not be functional until applicant names have been entered into the system.

In the Applicant Setup tab, fill out the form with the applicants information and click the **Save** button at the bottom left of the page. You should receive the message "You have successfully created a new applicant." If you wish to create more applicants, click on the **Create New Applicant** button at the bottom of the page for a blank form and don't forget to click the **Save** button after entering each applicant.

Step 2 – Assign a test to an applicant
Click the "Assign Test" tab and select the applicant you would like to assign a test to from the drop-down list. Below you will see a list of tests that are available to the selected applicant. To the right of each test is a link to view his/her respective Administrator's Manuals. Click the checkbox next to the test you wish to assign, then click the **Assign Test** button at the bottom of the page.

Step 3 – Administer a test
Please inform your applicants:

1. Take the test using **only** Internet Explorer.

2. Make sure pop-up blockers are inactivated as the system will open a new screen.

3. Do not use the back button on the task bar during the test, as this will kick the applicant out of the test.

Click the "Administer Test" tab. Select an applicant, with previously assigned tests, from the drop-down list. Select the test that you want to administer. You may administer the test in one of three formats:

The **Begin Test Now** button will start the test immediately.

The **Send Email** button will e-mail an applicant the URL to our testing site along with a unique Session ID for them to enter to take the test.

The **Print Access Info** button will print out the URL to our testing site along with a unique Session ID, for the applicant, to enter to take the test.

Scoring Instructions for Web-based Tests

All web-based tests are scored automatically. Please read the following instructions to view the scores of a test.

View Test Results

Once a test has been completed, log in as an administrator and click the "Test Results" tab. You may view test results in one of two ways:

1. Select the applicant's name from the "Applicant Name:" drop-down list and click the **Show Tests for Applicant** button. This presents all tests taken by the selected applicant. Click on one of the tests to present its results.

   -or-

2. Select the test from the "Test Name:" drop-down list and click the **Show Applicants for Test** button. This presents all applicants who have taken the selected test. Click on the applicant's name to present test results.

At any time in the future you may go back and view past applicants' test results. They are saved in our system indefinitely.

Interpreting the Test Results

There are five tabs on a test's results page:

Test Scores: Presents raw score, corresponding percentile with interpretive text and the average score for each test scale.

Test Score Graphs: Presents the same information as Test Scores along with the graphical view of the corresponding percentile score.

Interview Questions: Presents suggested follow-up questions to help you further evaluate the candidate's responses to particular test items. If the test does not include this feature, clicking on this tab will result in the following message: "There are no follow-up interview questions for this test."

Candidate Responses: Lists each test question along with the applicant's response. If a test includes multiple scales, the test questions and applicants' responses are separated by Scale.

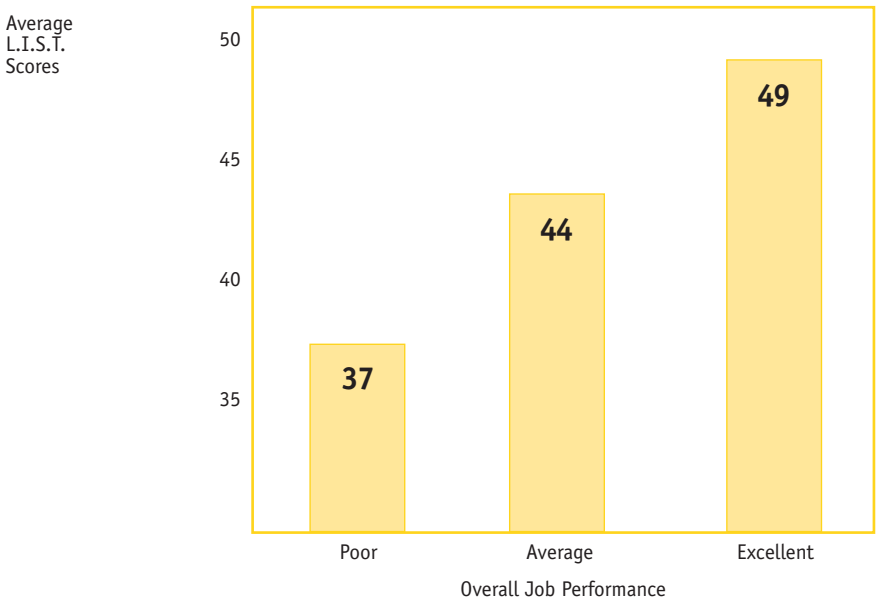
Utilities: Allows you to change your online testing password and print the various test result sections.

Interpretation and Use of Scores

To help you hire the best individual for your organization, the L.I.S.T. scores should be used in conjunction with other applicant information (e.g., the applicant's work history, references and interview evaluations). A high score on a particular section indicates that there is a strong probability that the applicant will do well when performing job tasks that require that particular skill or attitude. Therefore, the higher the score, the higher the chances of hiring a top performing employee.

Based on the data collected and analyzed for the research effort presented in the Validity and Reliability section of this manual, the average L.I.S.T. score associated with various performance levels has been identified and is presented below.

Overall Job Performance by Average L.I.S.T. Score



Remember that the total L.I.S.T. score is calculated by dividing the sum of the Reliability and Illegal Drug Use Attitudes Scale scores by 10 and adding it to the Math and Reasoning, Inspection Skills and Assembly Skills section scores.

Norms

When evaluating applicants, norms provide a point of reference regarding the relative test score of each applicant/employee. Norms are the average scores, or distribution of scores, obtained from the study sample. These score "patterns" can be compared to your own applicants'/employees' test scores to better define their performance on the L.I.S.T.

Tables 1 to 5 on the following pages present the distribution scores and associated percentile rank for each test section of the L.I.S.T. Table 6 presents the same information for all section scores combined. The percentile rank is the percentage of applicants in the sample who obtained scores lower than the corresponding test score. For example, when reviewing Table 1, it can be said that an applicant obtaining a score of 15 scored in the 52nd percentile. This means the applicant scored equal to or higher than 52% of the applicants in the norm sample.

Table 1

Math and Reasoning Scale

Test Score	Corresponding Percentile
20	100
19	98
18	90
17	79
16	64
15	52
14	40
13	32
12	24
11	19
10	14
9	10
8	8
7	6
6	4
5	3
4	2
3 or less	1

Average Score	15
Standard Deviation	3.74
Number of Participants	561

Table 2

Inspection Scale

Test Score	Corresponding Percentile
20	100
19	97
18	97
17	96
16	95
15	94
14	94
13	92
12	91
11	90
10	86
9	71
8	63
7	51
6	42
5	35
4	26
3	17
2	12
1	5
0 or less	1

Average Score	8
Standard Deviation	4.21
Number of Participants	519

Table 3

Assembly Scale

Test Score	Corresponding Percentile
10	100
9	97
8	90
7	83
6	71
5	60
4	45
3	33
2	19
1	9
0	2

Average Score	5
Standard Deviation	2.51
Number of Participants	517

Table 4

Reliability Scale

Test Score	Corresponding Percentile
100	100
99	96
98	95
97	93
96	92
95	89
94	86
93	84
92	81
91	79
90	77
89	73
88	69
87	66
86	62
85	58
84	53
83	48
82	43
81	37
80	33
79	28
78	24
77	19
76	16
75	12
74	10
72-73	8
71	7
70	5
68-69	4
66-67	3
64-65	2
63 or less	1

Average Score	84
Standard Deviation	3.39
Number of Participants	498

Table 5

Drug Use Attitudes Scale

Test Score	Corresponding Percentile
100	100
99	81
98	75
97	71
96	66
95	58
94	53
93	47
92	45
91	41
90	36
89	32
88	28
87	26
86	24
85	22
84	20
83	18
82	14
81	13
80	11
79	8
78	6
77	5
75-76	4
74	3
69-73	2
68 or less	1

Average Score	92
Standard Deviation	7.98
Number of Participants	496

Table 6

L.I.S.T. Total Score*

Test Score	Corresponding Percentile
61+	100
60	99
59	98
58	98
57	97
56	95
55	93
54	89
53	87
52	84
51	80
50	77
49	69
48	63
47	59
46	54
45	49
44	45
43	39
42	35
41	30
40	26
39	22
38	18
37	15
36	12
35	9
34	8
33	7
32	6
31	4
30	3
29	2
28 or less	1

Average Score	45
Standard Deviation	7.37
Number of Participants	490

* The L.I.S.T. total score is calculated by dividing the Reliability Scale score and the Drug Use Attitude score by 10. These scores are then added to the Math and Reasoning, Inspection and Assembly section scores.

Developing Company-Specific Norms

You can use the information presented in the graph and tables in this section as guides when evaluating job candidates; however, we strongly recommend that you collect and validate your own test data. The applicant pool in your organization may differ from the study sample presented in this manual. Factors such as geographic location, business type and job responsibilities may have a significant effect on test scores.

One way to develop your own norms and benchmarks is to administer the L.I.S.T. to your current employees. This will allow you to compare the scores of your top performers with those of your less productive employees. The information can then serve as a guide during your applicant evaluation process. In addition, if you can establish and document that, in general, high scorers on specific sections are also your better performing employees, this can serve as an initial step in establishing the validity of the L.I.S.T. within your organization.

If you do administer the L.I.S.T. to your employees for the purpose of establishing company-specific norms, make sure your employees understand that the results of your study will be used for norm development only and that their employment status will in no way be affected by their scores.

The EEOC and the Uniform Guidelines on Employee Selection Procedures recommend that job analysis be performed in conjunction with validation studies to determine the job-relatedness of each test and other selection tools used throughout the hiring process. It is the employer's responsibility to periodically monitor its employment screening process to ensure that it is fair and valid.

Interviewing with the L.I.S.T.

In addition to providing an objective measure of critical skills and attitudes, the Workplace Attitudes section can also serve as a useful tool during the interviewing process. Responses to the questions in this section can be addressed during the interview and the applicant may be given the opportunity to explain his/her answer. This approach may reveal some interesting insights into the applicant's unique style or tendencies.

Appropriate Responses

As has been described previously in this manual, the essential functions of the job(s) for which the applicant is being evaluated should be identified through job analysis. The interview process can then be structured to focus on those personality characteristics or skill sets that are essential for effective job performance.

Before you interview the job applicant, carefully review his/her answers to the Workplace Attitudes questions. Responses to the Reliability and Illegal Drug Use Attitudes questions can reveal important information that may have been otherwise overlooked. Select several questions that were answered appropriately relative to the requirements of the job. Follow up during the interview with reinforcing/positive questions to "break the ice" and establish rapport with the applicant.

Below is an example of a follow-up question to an appropriate response.

> "You strongly disagreed with the statement that said, 'Some problems just can't be solved' (Question #4). I agree with your response. Can you tell me specifically why you feel this way?"

Asking follow-up questions to positive responses helps ease some of the tension inherent in the interviewing process. Positive feedback encourages the applicant to open up and share more potentially critical information.

Inappropriate Responses

Questions answered inappropriately relative to the requirements of the job should also be analyzed. Inappropriate responses should be followed up with questions to clarify the reasons for the response. Clarification is important in helping to understand the applicant's thoughts and potential behaviors as they pertain to the "negative" answer.

Below is an example of a follow-up question to an inappropriate response.

> "You agreed with the statement, 'Employees who are predictable are boring.' (Question #22). Can you elaborate on this? What specifically do you mean? Can you give me some examples?"

Follow-up questions to inappropriate responses can be used to better understand the opinions or thoughts of the applicant which may be contrary to the ideal employee. This information is extremely valuable in determining an individual's fit into your organization.

Discussing the Results of the L.I.S.T.

Your company should develop a procedure so that the applicant can be told what the next step in the hiring process is, regardless of his/her score on the L.I.S.T. or any other assessment tool. Emphasize that the L.I.S.T. is only one of the criteria used to determine if the applicant is a good match for the position. Remind the applicant that there are many people applying for the same position and that each applicant will be considered based on how all of his/her qualifications and experience match the position's requirements.

Some interviewers may be tempted to look for a quick or easy reason to tell the applicant why he/she was not selected. "Blaming" a test may seem like a plausible reason, but it is no comfort to the rejected applicant and should not occur. The fact is, the reason to hire or not to hire should never be based solely on any single test score. It is the interviewer's responsibility to review all of the information gathered from the various tools used during the hiring process – such as the job application, the interview, reference checks and other tests – to form the decision on the applicant's appropriateness for the position.

The issue is, and should always be, whether there is an appropriate job fit between position and applicant. Using the L.I.S.T. is only one part of the information you need to make a decision. The other important part is knowing what else is required and desired in the employee filling the position, and effectively using all the resources available to you to make the best decision. This will ensure an effective selection process that offers a more comprehensive view of the applicant and results in hiring the best employee for your organization.

The employer assumes full responsibility for the proper use of the L.I.S.T. as mentioned in this manual. This includes establishing its job-relatedness to the position in question. If you have any questions about the proper use of employment tests, contact an employment testing specialist.

Validity

Effective applicant/employee evaluation procedures need to be valid. Validity can be defined as the extent to which the measure helps in predicting job performance. In other words, validity can be conceptualized as to whether or not there is a relationship between test scores and job performance. The research studies described next have been conducted to determine the validity of the L.I.S.T.

The type of validation design conducted here is known as concurrent, criterion-related validation. A professionally conducted, concurrent, criterion-related validation study is acknowledged to be an acceptable means of test validation as described by the federal government's Uniform Guidelines on Employee Selection Procedures. Essentially, this approach requires that the test be administered to current employees and, concurrently, data on the performance of these employees be gathered. If the test is valid, one would expect a statistically significant correlation between individual test scores and job performance. In other words, those employees who score high on the test would be those who also perform best on the job; those who do poorly on the test would be likely to receive poor performance evaluations.

Validity Study #1

The L.I.S.T. was administered to 43 laborers employed by an employment agency specializing in the placement of light industrial workers. Supervisors were asked to rate the study participants on ten aspects of job performance. These ten performance measures are presented below.

	Very Low Level		Average Level				Very High Level
1. Learning Ability Learns from on-the-job experiences. Grasps new ideas/materials with ease.	1	2	3	4	5	6	7
2. Ability to Understand Instructions Interprets instructions correctly and uses knowledge and experiences to effectively complete the task at hand with minimal supervision.	1	2	3	4	5	6	7
3. Math Skills Ability to perform basic computations including adding, subtracting, multiplying, dividing, using decimals and percentages.	1	2	3	4	5	6	7
4. Perceptual Accuracy Attention to small details. Has the ability to inspect and quickly identify defects or damaged goods/products.	1	2	3	4	5	6	7
5. Assembly Has the ability to quickly and accurately assemble products according to specified procedures.	1	2	3	4	5	6	7
6. Reliability Can be counted on to get the job done. Requires little follow-up when assigned a project or task.	1	2	3	4	5	6	7
7. Work Quality Excellent quality of work. This individual is thorough and strives for perfection.	1	2	3	4	5	6	7
8. Attendance/Punctuality Has excellent attendance. Is punctual and available when needed.	1	2	3	4	5	6	7
9. Logical and Analytical Thinks things through in a logical manner. Does not jump to conclusions. Is very logical and analytical in his/her thinking.	1	2	3	4	5	6	7
10. Safety Follows all safety rules. Works in a careful and safe manner.	1	2	3	4	5	6	7

An "Overall Job Performance Rating" was calculated by averaging the ratings of the ten job dimensions listed above.

Correlation analyses were then conducted between test scores and job performance ratings to determine the degree to which the five subtests that make up the L.I.S.T. predicted various aspects of job performance. Table 7 shows the correlation coefficients above .20 that were obtained between individual section scores and supervisor evaluations. Correlations above .20 are generally considered acceptable with respect to the predictive ability of an assessment instrument. As a point of reference, the average correlation coefficient for the standard interview has been found to be .14.[2] The correlations presented in Table 7 indicate that employees who scored high on the test sections also tended to receive high evaluations from his/her supervisor.

Table 7

Correlations between L.I.S.T. and Job Performance Ratings – Validity Study #1

L.I.S.T. Section	Job Performance Dimension	Correlation Coefficient	Significance Level	N
Math & Reasoning	Learning Ability	.22	p<.175	41
	Ability to Understand Instructions	.22	p<.166	41
	Math Skills	.59	p<.001	42
	Perceptual Accuracy	.25	p<.133	42
	Assembly Skills	.54	p<.001	42
	Reliability	.34	p<.029	41
	Work Quality	.33	p<.043	39
	Overall Job Performance	.38	p<.020	38
Inspection	Perceptual Accuracy	.51	p<.002	41
	Assembly Skills	.33	p<.038	41
Assembly	Learning Ability	.39	p<.013	41
	Ability to Understand Instructions	.34	p<.030	41
	Math Skills	.34	p<.029	42
	Perceptual Accuracy	.54	p<.001	42
	Assembly Skills	.72	p<.001	42
	Reliability	.27	p<.084	41
	Work Quality	.34	p<.036	39
	Logic and Analytical Safety	.25	p<.124	41
	Safety	.28	p<.081	39
	Overall Job Performance	.46	p<.005	38
Drug-Use-Attitudes	This scale was not related to supervisory ratings for this study sample. See Validity Studies #3 and #4 for an indication of what behaviors this scale has predicted.			
Reliability	Reliability	.20	p<.202	42
	Quality of Work	.20	p<.214	40
L.I.S.T. Total Score	Learning Ability	.25	p<.123	40
	Ability to Understand Instructions	.29	p<.072	40
	Math Skills	.45	p<.004	41
	Perceptual Accuracy	.45	p<.004	41
	Assembly Skills	.62	p<.001	41
	Reliability	.31	p<.050	40
	Work Quality	.33	p<.041	38
	Overall Job Performance	.37	p<.025	37

Note: N equals the number of participants in the analysis.

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

Validity Study #2

In addition to Validity Study #1, the L.I.S.T. was administered to 33 warehouse, assembly and production workers employed in a marketing organization. Each employee's immediate supervisor was asked to rate the individual on the same performance rating form used in Validity Study #1. Table 8 presents the correlation coefficients above .20 that were found between individual section scores and supervisor evaluations. Consistent with the results of Validity Study #1, these correlations indicate that employees who scored high on the test sections also tended to receive high evaluations from his/her supervisor. Whereas, employees who scored low, received low performance ratings.

Table 8

Correlations between L.I.S.T. and Job Performance Ratings – Validity Study #2

L.I.S.T. Section	Job Performance Dimension	Correlation Coefficient	Significance Level	N
Math & Reasoning	Ability to Understand Instructions	.28	p<.115	33
	Math Skills	.29	p<.127	29
	Perceptual Accuracy	.24	p<.185	32
	Work Quality	.28	p<.114	33
	Overall Job Performance	.21	p<.302	27
Inspection	Learning Ability	.25	p<.166	33
	Ability to Understand Instructions	.34	p<.050	33
	Perceptual Accuracy	.21	p<.240	32
	Assembly Skills	.28	p<.128	31
Assembly	Ability to Understand Instructions	.25	p<.171	33
	Math Skills	.29	p<.132	29
	Perceptual Accuracy	.22	p<.221	32
	Work Quality	.20	p<.259	33
	Logic and Analytical	.24	p<.175	33
	Safety	.24	p<.189	33
	Overall Job Performance	.28	p<.154	27
Drug-Use Attitudes	Learning Ability	.25	p<.166	33
	Ability to Understand Instructions	.28	p<.112	33
	Perceptual Accuracy	.26	p<.152	32
Reliability	Learning Ability	.35	p<.045	33
	Ability to Understand Instructions	.34	p<.050	33
	Perceptual Accuracy	.47	p<.007	32
	Quality of Work	.37	p<.033	33
	Overall Job Performance	.31	p<.121	27
L.I.S.T. Total Score	Learning Ability	.27	p<.134	40
	Ability to Understand Instructions	.40	p<.023	40
	Math Skills	.32	p<.088	41
	Perceptual Accuracy	.33	p<.066	41
	Work Quality	.26	p<.153	41
	Overall Job Performance	.27	p<.169	40

Note: N equals the number of participants in the analysis.

Validity Study #3

In another attempt to examine the predictive ability of the L.I.S.T., the test was administered to 66 employees employed in a manufacturing facility and 28 employees employed in a printing company. Job titles included mechanic, technician, machine operator and pressman. Again, each employee's immediate supervisor was asked to rate the individual on the same performance rating form used in Validity Study #1. Table 9 presents the significant correlation coefficients that were found between individual section scores and supervisor evaluations. Consistent with the results of Validity Study #1 and #2, these correlations strongly suggest that employees who scored high on the test sections were rated as top performers by their supervisor. Conversely, employees who scored low, were rated low by their supervisor.

Table 9

Correlations between L.I.S.T. and Job Performance Ratings – Validity Study #3

L.I.S.T. Section	Job Performance Dimension	Correlation Coefficient	Significance Level	N
Math & Reasoning	Learning Ability	.27	p<.010	94
	Ability to Understand Instructions	.25	p<.018	94
	Math Skills	.42	p<.001	90
	Attention to Detail	.18	p<.085*	94
	Safety	.18	p<.090*	94
	Overall Job Performance	.28	p<.009	89
Inspection	This section of the test was not significantly related to supervisory ratings for this study sample.			
Assembly	Learning Ability	.23	p<.028	94
	Ability to Understand Instructions	.18	p<.079*	94
	Math Skills	.33	p<.002	90
	Attention to Detail	.17	p<.10*	94
	Assembly Skills	.25	p<.017	94
	Overall Job Performance	.21	p<.048	89
Drug-Use Attitudes	Math Skills	.23	p<.033	90
	Attention to Detail	.18	p<.092*	94
	Assembly Skills	.19	p<.064*	94
	Reliability	.19	p<.064*	94
	Logic and Analytical	.20	p<.057*	94
	Overall Job Performance	.32	p<.004	89
Inspection	Assembly	.13	p<.13**	94
Reliability	Learning Ability	.18	p<.080*	94
	Math Skills	.27	p<.012	90
	Attention to Detail	.23	p<.026	94
	Assembly Skills	.47	p<.007	32
	Quality of Work	.18	p<.089*	93
	Logic and Analytical	.24	p<.022	94
	Overall Job Performance	.28	p<.010	89
L.I.S.T. Total Score	Learning Ability	.28	p<.007	94
	Ability to Understand Instructions	.21	p<.042	94
	Math Skills	.42	p<.001	90
	Attention to Detail	.23	p<.029	94
	Assembly Skills	.25	p<.015	94
	Safety	.20	p<.059*	94
	Overall Job Performance	.32	p<.004	89

Note: N equals the number of participants in the analysis.
*Correlation approaches .05 level of statistical significance.
**This was the highest correlation obtained for the Inspection test section within this study sample.

Validity Study #4 (Spanish Version)

The Spanish version of the L.I.S.T. was administered to 51 Hispanic employees employed in a manufacturing company. Job titles included inspector, mold cleaner, materials handler, foreman, mechanic, forklift operator, and machine operator. The supervisors of these employees were asked to rate their employees' job performance on the same performance evaluation form discussed in Validity Study #1. Table 10 presents all the correlation coefficients above .20. Consistent with the results of Validity Studies #1, #2 and #3, these correlations indicate that those employees who scored higher on the test received higher job performance ratings from their supervisors than those employees who scored lower.

Table 10

Correlations between L.I.S.T. (Spanish Version) and Job Performance Ratings – Validity Study #4

L.I.S.T. Sections	Job Performance Dimension	Correlation Coefficient	Significance Level	N
Math & Reasoning	Learning Ability	.30	p<.036	51
Inspection	Ability to Understand Instructions	.22	p<.115	51
	Attention to Detail	.23	p<.106*	51
Assembly	Learning Ability	.28	p<.050	51
	Ability to Understand Instructions	.25	p<.080*	51
	Assembly Skills	.22	p<.130	50
Drug-Use Attitudes	Reliability	.22	p<.123	51
Reliability	Ability to Understand Instructions	.35	p<.013	51
	Attention to Detail	.25	p<.078*	51
	Assembly Skills	.32	p<.024	50
	Reliability	.26	p<.068*	51
	Attendance	.23	p<.113	51
	Safety	.28	p<.050	51
	Overall Job Performance	.26	p<.067*	50
L.I.S.T. Total Score	Learning Ability	.30	p<.032	51
	Ability to Understand Instructions	.29	p<.043	54
	Attention to Detail	.20	p<.160	51
	Assembly Skills	.23	p<.108*	50

Note: N equals the number of participants in the analysis.
*Correlation approaches .05 level of statistical significance.

Validity Study #5

The Illegal Drug Use Attitudes Scale of the L.I.S.T. was administered to 79 individuals employed currently or within the past year. The jobs held ranged from entry-level positions through management. These individuals were enrolled in university-level courses and completed the test in return for extra-credit points. In conjunction with the test, participants answered questions about their past/present workplace behavior relative to illegal drug use.

The test administrations were totally anonymous to increase the accuracy and candidness of the self-report questions. The participants' professors did not have access to the completed tests or the self-report measures. The self-report measures are presented below.

Illegal Drug Use Rating Scale

*In the past six months, how many times did you show up to work intoxicated from the use of illegal drugs (including marijuana, cocaine, crack, etc.)?	0	1	2	3	4	5 + (Specify) _____
*In the past six months, how many times did you consume illegal drugs (including marijuana, cocaine, crack, etc.) during work hours and/or work breaks?	0	1	2	3	4	5 + (Specify) _____
In the past year, how many times have you gone against your supervisor's wishes?	0	1	2	3	4	5 + (Specify) _____
In the past year, how many work-related policies have you broken?	0	1	2	3	4	5 + (Specify) _____

*An overall illegal drug use rating was obtained by adding the responses to the self-report measures above identified with an asterisk (*).

Correlations between the Illegal Drug Use Attitudes Scale and the self-report behavioral measures were performed to determine the degree to which the Scale predicted past illegal drug-related activities in the workplace. The results of these analyses are presented in Table 11. These findings strongly suggest that the Illegal Drug Use Attitudes Scale is a valid predictor of illegal drug use activities in the workplace as well as non-compliance behaviors. That is, the higher an individual scored on this Scale, the less likely it was that the individual was involved with illegal drugs in the workplace and did not comply with established policies and procedures. The negative correlations denote this inverse relationship.

Table 11

Correlation between L.I.S.T. Illegal Drug-Use Attitudes Scale and Self-Report Measures – Validity Study #3

Behavioral Criteria	Correlation Coefficient	Significance Level	N
In the past six months, how many times did you show up to work intoxicated from the use of illegal drugs (including marijuana, cocaine, crack, etc.)?	-.36	p<.001	79
In the past six months, how many times did you consume illegal drugs (including marijuana, cocaine, crack, etc.) during work hours and/or work breaks?	-.49	p<.001	79
In the past year, how many times have you gone against your supervisor's wishes?	-.19	p<.10	78
In the past year, how many work-related policies have you broken?	-.35	p<.003	77
Overall Illegal Drug Use Rating	-.60	p<.001	79

Note: N equals the number of participants in the analysis.

Validity Study #6

Data from an additional 62 employees were collected and analyzed in order to cross-validate the Illegal Drug Use Attitudes Scale. Cross validation provides evidence for the generalization of results to individuals not included in the original study.

The study sample again included employees from a wide range of jobs. The Illegal Drug-Use Attitudes Scale was administered and anonymous self-report data were collected. Once again, validity coefficients were computed between test scores and past behavior. The results of this analysis are presented in Table 12. Consistent with Validity Study #3, these findings offer further support for the validity of the Illegal Drug-Use Attitudes Scale. The results again demonstrated that the higher an individual scored on this Scale, the less likely it was that the individual had engaged in counterproductive workplace behaviors.

Table 12

Correlation between L.I.S.T. Illegal Drug-Use Attitudes Scale and Self-Report Measures – Validity Study #4

Behavioral Criteria	Correlation Coefficient	Significance Level	N
In the past six months, how many times did you show up to work intoxicated from the use of illegal drugs (including marijuana, cocaine, crack, etc.)?	-.12	p<.36	62
In the past six months, how many times did you consume illegal drugs (including marijuana, cocaine, crack, etc.) during work hours and/or work breaks?	-.27	p<.04	62
In the past year, how many times have you gone against your supervisor's wishes?	-.47	p<.001	62
In the past year, how many work-related policies have you broken?	-.27	p<.04	61
Overall Illegal Drug Use Rating	-.24	p<.05	62

Note: N equals the number of participants in the analysis.

When the data from Validity Studies #5 and #6 were combined, the following was observed: a score range of 79-100 indicated that 1% of the study participants engaged in illegal drug-use activities at work within the past six months (Low Risk); a score range of 69-78 indicated 5% (Low/Moderate Risk); a score range of 56-68 indicated 23% (Moderate Risk); and a score range of 20-55 indicated 100% (High Risk).

Reliability

In addition to validity research, various analyses have been conducted to determine the reliability of the Reliability and Illegal Drug-Use Attitudes Scales that are included in the L.I.S.T.; that is, to what degree do the items in these Scales measure the same constructs? Reliability coefficients for each Scale are presented in Table 13.

Table 13

Reliability Coefficients for the L.I.S.T. Workplace Attitudes Scales

Scale	Reliability Coefficient
Reliability	.78
Illegal Drug-Use Attitude	.81

The results obtained in the validity studies and the reliability research conducted for the L.I.S.T. offer strong evidence that the test is a valid and reliable predictor of various critical, work-related attitudes/behaviors.

Once you have established that math and reasoning, inspection, assembly, reliability and/or drug-free work activities are important for performing the essential functions of the job, incorporating the L.I.S.T. Test into your selection process should significantly help you identify the best person for the job. Understanding an applicant's skill level and attitudes as they relate to the job in question are critical to finding the right fit and enhancing the effectiveness of your selection process.

While HR•Assessments were designed to help predict various aspects of human behavior, score results are presented in terms of probabilities. False Positives and False Negatives are expected. EDI and the test developer are not liable for test taker, applicant or employee behaviors.

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