WORK SMARTS™

Using Multiple Intelligences to Make Better Career Choices

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Administrator's Guide

Introduction

This brief guide was written to provide additional information for professionals using *Work Smarts. Work Smarts* helps individuals identify their most-developed forms of intelligence based on Howard Gardner's theory of multiple intelligences. This knowledge can then be used to make more-informed career choices. The assessment is designed to be self-scored and self-interpreted without the use of any other materials, thus providing immediate results for the respondent and/or counselor.

Background

A thorough review of the literature was conducted to support the development of the *Work Smarts* assessment. This review included a survey of intelligence and the intelligence testing movement, as well as a review of Howard Gardner's theory of multiple intelligences and the theoretical constructs that form the basis of that theory. Following is a brief summary of the research that underlies the *Work Smarts* assessment.

Intelligence and Intelligence Testing

Walsh and Betz (1995) believed that the concept of intelligence and the idea that people possess different amounts of intelligence have their origins as far back as the ancient Greeks. Intelligence is a word that is commonly used in conversation and many people have taken a traditional Intelligence Quotient (IQ) test at some point in their lives. These tests presume to derive an indication of our raw intelligence level, but they do little to suggest how we will function in our professional lives.

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Intelligence testing has a rich tradition and history, but despite this, there has been little agreement on what actually constitutes intelligence. Alfred Binet developed the first Intelligence test in 1904 and since that date many people have held the belief that one score derived from an IQ test could determine how they would do in school, how successful they would be in their careers, and what types of occupations they could enter. Many people have even suggested that one's intelligence is inherited and that little can be done to change it.

Although intelligence tests have been refined and improved over time, the notion that one score on an intelligence test can encompass a person's intellectual capacity has caused some people to question this notion of traditional intelligence testing. Many recent theorists have suggested that the notion of IQ is antiquated and needs to be replaced by more modern ways of thinking. Spearman (1927) and Thurstone (1938) suggested early on that one score on an IQ test was insufficient to determine a person's overall intellectual functioning. In 1952, Jean Piaget proposed a model that postulated three major stages of intellectual development and allowed for growth from stage to stage. Sternberg (1988) proposed a "triarchic" theory that explained intelligence through three mechanisms of functioning.

In 1983, Howard Gardener, a developmental psychologist at Harvard, proposed the theory of multiple intelligences to reflect the thought that intelligence is made up of many different facets. Gardner suggested that his work on multiple intelligences and the work on the constraints of the mind yield a view of the human being significantly different from the theories subscribed to in the past. As a result of his work, intelligence is now being seen not as a single characteristic that is inherited, but a collection of mental capacities that can be enhanced if information is presented in an appropriate way. Gardner suggested that "there exists a multitude of intelligences, quite independent of each other; that each intelligence has its own strengths and constraints; that the mind is far from unencumbered at birth; and that it is unexpectedly difficult to teach things that go against early 'naïve' theories or that challenge the natural lines of force within an intelligence" (p. xix).

Researchers and practitioners agree that Gardner's theory offers great promise for counselors, educators, behaviorists, psychologists, and many others in the helping professions. More specifically, it can help people explore and discover occupations for which they are naturally "smart." In addition, the theory can help job search specialists be more effective in helping people use their natural intelligences in finding employment.

Theoretical Constructs of Multiple Intelligence Theory

Howard Gardner (1983), in his book *Frames of Mind*, suggested that intelligence was too narrowly defined and that there was more than one "intelligence"—that such a framework did not fully encompass the range of human intellectual capabilities. He questioned the validity and reliability involved in taking a person out of his or her natural learning environment and asking that person to complete tasks never encountered before (indicative of the traditional testing methods to discern IQ). Gardner suggested that intelligence is more a function of problem solving and creating products in a natural setting.

In his theory of multiple intelligences, Gardner endeavored to broaden the scope of human potential beyond the existence of a single Intelligence Quotient (IQ) score. He proposed seven intelligences (later amended to eight) as opposed to one. Gardner (1983, 1993) set up several criteria that each construct had to meet in order to be considered an intelligence. These criteria included the following:

- There exists eight relatively autonomous brain systems (the intelligences) that might continue to work, even though one would become damaged.

- There had to be savants, prodigies, or other exceptional individuals in whom you can see single intelligences operating at high levels while their other intelligences function at a lower level.

- Each construct had to have a developmental history, a developmental trajectory throughout peoples' lives, and a definable set of end-state performance standards.

- Each intelligence had to meet the test of having its roots embedded in the evolution of human beings and other species (for example, archeological evidence of musical instruments).

- Each intelligence was thoroughly tested and standardized as reliable and valid using a formal testing program of standardized assessments.

- Each intelligence had to be observable as separate from the other intelligences through observation of experimental psychological tasks.

- Each intelligence had to have an identifiable set of core functions or a set of operations in order to function.

Based on the above criteria, Gardner (1983) suggested that the broad range of abilities that people possess could be grouped by capabilities into eight comprehensive categories or intelligences. He along with others (c.f. Armstrong, 1994 a, b) described the multiple intelligences as follows (names for the corresponding *Work Smarts* scale included in parentheses):

- **Linguistic Intelligence (Word Smart):** The capacity to use words effectively, whether orally or in writing. The kinds of processes used in this intelligence include the ability to manipulate the structure or syntax of language, the sounds of language, the meanings of words and language, and the pragmatic or practical uses of language.

- **Logical-Mathematical Intelligence (Logic Smart):** The capacity to use numbers effectively and to reason well. This intelligence includes sensitivity to logical patterns or relationships, if-then and cause-effect propositions, and other relational abstractions. The kinds of processes used in this intelligence include categorization, classification, inference, generalization, calculation, and hypothesis testing.

- **Spatial Intelligence (Picture Smart):** The capacity to perceive the visual-spatial world accurately and to perform transformations upon these perceptions. This intelligence involves sensitivity to shape, line, color, form, and space and the relationships that exist between these distinct elements. The kinds of processes used in this intelligence include the capacity to visualize, to graphically represent various spatial or visual ideas, and to orient oneself appropriately in a spatial matrix.

- **Bodily-Kinesthetic Intelligence (Body Smart):** The capacity to use one's whole body to express ideas and feelings and the facility to use one's hands to produce and transform objects. The kinds of processes used in this intelligence include specific physical skills such as coordination, balance, dexterity, strength, flexibility, speed, and tactile capacities.

- **Musical Intelligence (Music Smart):** The capacity to perceive, discriminate, transform, and express musical forms. The kinds of processes used in this intelligence include sensitivity to rhythm, pitch, melody, and timbre of a musical piece. People can have a figural or "top-down" understanding of music (global, intuitive), a formal "bottom-up" understanding (analytical, technical), or both.

- **Interpersonal Intelligence (People Smart):** The capacity to perceive and make distinctions in the moods, intentions, motivations, and feelings of other people. The kinds of processes used in this intelligence include sensitivity to facial expressions, voice, and gestures; the capacity for discriminating among the various kinds of interpersonal cues; and the ability to respond effectively to those cues in a pragmatic way.

- **Intrapersonal Intelligence (Self Smart):** The capacity to know oneself and the ability to act adaptively on the basis of this self-knowledge. The kinds of processes used in this intelligence include having an accurate picture of oneself; awareness of inner moods, intentions, motivations, temperaments, and desires; and the capacity for self-discipline, self-understanding, and self-esteem.

- **Naturalistic Intelligence (Nature Smart):** The capacity to know and relate well to one's natural surroundings. The kinds of processes used in this intelligence include having a greater sensitivity to nature and one's place within it, the ability to nurture and grow things, and a great ease in caring for and interacting with animals. It may also include being able to discern changes in weather or fluctuations in natural surroundings.

Gardner (1983) concluded that all humans are capable of developing any of these intelligences. He suggested that intelligences owe their development and strengths to a combination of heredity and early training. He said that "given a consistent interaction among these factors, some individuals will develop certain intelligences far more than others, but every normal individual should develop each intelligence to some extent, given but a modest opportunity to do so" (p. 278).

In his book *Multiple Intelligences in the Classroom*, Armstrong (1994b) provided a concise overview of Gardner's theory of multiple intelligences. Armstrong suggested that the MI theory has several primary theoretical bases, including the following:

- **Each person possesses all intelligences.** MI theory is not a "type theory" for determining the one intelligence that fits, but is rather a theory of cognitive functioning in which each person has capacities in each of the intelligences. These intelligences also function together in unique ways for each person. Some people appear to possess extremely high levels of functioning in all or most of the intelligences. Most people, however, tend to be highly developed in some intelligences, modestly developed in others, and relatively underdeveloped in the rest.
- **Most people can develop each intelligence to an adequate level of competency.** Everyone has the capacity to develop all of their intelligences to a reasonably high level of performance if given the appropriate encouragement, enrichment, and instruction.
- **Intelligences work together in complex ways.** Intelligences are always interacting with one another when used to complete a task.
- **There are many ways to be intelligent within each category.** There is no standard set of attributes that people must have to be considered intelligent in a certain area. MI

theory emphasizes the rich diversity of ways in which people show their gifts within intelligences as well as between intelligences (pp. 11–12).

By expanding our notion of what constitutes intelligence, Gardner and other contributing theorists offered innovative new ways to approach learning and development. In turn, this opens up the potential for individuals to explore career, learning, and life opportunities that fit more naturally with their most-developed intelligences or to pursue opportunities to develop their intelligences further.

Multiple Intelligences in Education

The theory of multiple intelligences was first proposed as an educational theory designed to help schools develop individual-centered education with a curriculum tailored to the needs of each student rather than relying on a uniform curriculum. Traditionally, school systems have emphasized the development of logical (math) and linguistic (reading and writing) intelligences to the exclusion of other intelligences. Gardner's (1983) theory suggested that students will succeed more often if they are exposed to a broader view of education in which teachers utilize a variety of methodologies, exercises, and activities to reach all students—not just those with logical and linguistic intelligence.

Since its initial development, there has been solid research to support the application of multiple intelligence theory in the classroom. In one such study, Campbell (1990) studied students in a yearlong research project that exposed them to multiple intelligences through learning centers tied to each of the eight intelligences. Among his results, Campbell found the following:

- Students displayed increased independence, responsibility, and self-direction.

- Students previously identified as having behavioral problems made significant improvement in behavior.

- Leadership skills emerged in most students.

- Students became progressively more skilled at working effectively in this unique and non-traditional classroom format.

- Students began developing underdeveloped intelligences.

- At the end of the year, students were able to remember specific academic information better.

- Parents reported that behavior improved at home, more positive attitudes about school were exhibited, and attendance increased.

Gardner (1983) believed that multiple intelligence theory has numerous classroom applications. He felt that it helps to diversify instruction, aids students in becoming empowered, helps students better understand themselves and others, taps into and validates natural talents, and demonstrates a more egalitarian conceptualization of giftedness. Such educational applications and studies not only further support the validity of multiple intelligence theories, they also verify the potential to apply the theory to other contexts that require learning, problem solving, and skills application, such as the world of work.

Multiple Intelligences in Career Development

Though the theory of multiple intelligences is relatively new, it has already been shown to be useful in career counseling. Gardner (1999) suggested that businesses need to employ the full range of multiple intelligences and thus need to hire employees who represent the various intelligences. He said that employers in today's competitive workplace are attempting to learn about employees' favored ways of thinking and solving problems and are using this knowledge to hire and train people; set up teams; and make critical decisions about employment, advancement, and termination. Gardner suggested that managers are beginning to ask the following critical questions:

- What skills or intelligences are needed for particular roles, especially for new ones?
- Who on my staff already has these skills or intelligences? Who could readily acquire them?
- Who can work well with a person who has a particular profile of intelligences and fulfills a certain role?
- Which person, or kinds of persons, can train others in new skills?
- How will a project benefit from different mixes of individuals?

Similarly, other career professionals have urged the exploration of multiple intelligences to help people advance in their career development. Liptak (2001), in his book *Treatment Planning in Career Counseling,* suggested that career counselors explore individual multiple intelligences as part of a comprehensive treatment plan. Kerka (1999) wrote that because the multiple intelligence theory was formed in part by looking at what people do well in the performance of jobs and tasks, multiple intelligence assessment and learning activities should be very useful in individual career choice and career development. She believed that multiple intelligences can help people gather the information they need to make informed career choices, be inspired to explore career possibilities they had not thought about, and help people realize that intelligence comes in many different forms. Armstrong (1994b) concluded that, because it emphasizes a broad range of ways that adults pursue their work in life, multiple intelligence theory provides a vehicle for helping people begin to develop vocational aspirations and that "if students are exposed from a very early age to a wide variety of adults demonstrating real-life skills in all intelligences, they will have a firm basis upon which to launch a career once they leave school" (p. 162).

Shearer (1997) found that testing for multiple intelligences has been found to increase a student's self-awareness and assist in selection of majors and career planning. He suggested that testing for multiple intelligences be included in the curriculum for career exploration classes and workshops. He further said that there are four very practical implications for applying MI to career planning, selection, and development:

- The chances for maximum career development are increased when there is a good match between the job tasks performed by individuals and their multiple intelligence strengths and weaknesses.
- The strength and development of interpersonal intelligence is a key factor in positive career selection and advancement in an organization.
- Career development will be enhanced when a person's mentors, supervisors, peers, and coworkers are aware and supportive of the growth of that person's particular strengths.

- The negative impact of the person's weaknesses on career success will be minimized when strengths are emphasized and employed to bridge over any significant deficits.

Nardi & Rollin (2009) found that the theory of multiple intelligences helps people identify how they are smart and find ways to succeed in the workplace. They suggested that multiple intelligence theory can be useful when employees want to know how to recognize and utilize their natural talents, blaze their own paths to high performance, develop and appreciate themselves and their gifts, and value and guide others.

After running successful career development modules based on the multiple intelligence theory, Mantzaris (1999) concluded that multiple intelligence theory provides a valid approach for counseling and guiding people through the process of identifying their strengths and skills in order to make appropriate and gratifying career decisions.

Need for *Work Smarts*

Each intelligence has its own unique characteristics, tools, and processes. Each represents a different way of thinking, solving problems, learning, and interacting. Because all of these aspects of human functioning are critical in the workplace, it is crucial for people to explore the full span of their intelligences—utilizing their strongest intelligences and improving their underdeveloped intelligences. *Work Smarts* is designed so that people can explore their general range of intelligences and specifically build on their unique intelligence combinations. *Work Smarts* also provides occupational information, educational programs related to the intelligences, and tips for enhancing underdeveloped intelligences.

Career counselors and job search specialists are now beginning to understand how multiple intelligence theory can also apply to career exploration, decision making, and career implementation in the workplace. There is, however, no assessment that translates multiple intelligence theory into a framework that career specialists can easily use. *Work Smarts* allows career counselors to apply the theory of multiple intelligences to occupations, career development, and occupational success. It also allows career counselors to develop teaching and learning exercises based on each client's array of intelligences. This can enhance the clients' career choices, their career development, and the speed at which they find jobs.

Work Smarts can also be used in conjunction with other assessments to develop a comprehensive understanding of the individual. The aspect of *Work Smarts* that sets it apart from other assessments is its ability not only to identify the occupational strengths of the test taker, but also to provide information and exercises for exploring and developing underdeveloped intelligences.

By using the information provided by *Work Smarts*, test takers will

- Learn more about their strengths and weaknesses prior to choosing a career.

- Expand their career possibilities by making connections between their intelligences and their preferred work environments and activities.

- Exhibit enhanced self-esteem through the realization that there are more intelligences than math and English, and that they possess other talents and abilities that can have value in their career.

Work Smarts is intended for use in any type of program that provides career and employment counseling or any educational program that explores career options and/or learning styles. Agencies and schools that could use *Work Smarts* include high schools and middle schools, comprehensive career guidance programs, employment counseling programs, rehabilitation counseling programs, college counseling centers, after-school programs, disability employment programs, college career and placement offices, community colleges, military transition programs, school-to-work programs, employee development programs, or any agency that works with individuals who are engaged in career planning and exploration.

Administration and Interpretation

Work Smarts is simple to take and can be easily scored and interpreted. Each assessment contains 80 statements that describe a person's preferences and capabilities in eight different intelligences. Each statement asks the test taker to rate how well the statement describes them on a 3-point scale. *Work Smarts* also includes scoring directions, a scoring profile, descriptions of the eight intelligences, and an interpretive guide that helps test takers to connect their results to career and education opportunities. Finally, a space is provided for test takers to set goals for career exploration and self-improvement.

Work Smarts can be administered to individuals or to groups. It is written for individuals at or above the 8th grade level. Since none of the items are gender-specific, *Work Smarts* is appropriate for a variety of audiences and populations.

Administering *Work Smarts*

Work Smarts can be self-administered, and the inventory booklets are consumable. A pencil or pen is the only other item necessary for administering, scoring, and interpreting the inventory. The first page of the inventory contains spaces for normative data including name, date, gender, and age. Instruct each respondent to fill in the necessary information. Then read the description on the first page and the instructions for Step 1 while all respondents follow along. Test administrators should ensure that each respondent clearly understands all of the instructions and the response format. Respondents should be instructed to mark all of their responses directly on the inventory booklet. *Work Smarts* requires approximately 15–20 minutes to complete.

Work Smarts uses a series of steps to guide respondents. In Step 1, respondents mark their answers for each of the 80 statements. Respondents are asked to read each statement and then circle the response that best represents how well the statement describes them: respondents circle a 1 if they feel the statement is NOT LIKE them, a 2 if they feel the statement is SOMEWHAT LIKE them, or a 3 if they feel the statement is VERY MUCH LIKE them. Each of the scales is made up of 10 items that represent the type of intelligence being measured by the scale.

In Step 2 respondents add their scores for each color-coded scale. Step 3 provides descriptions of the eight scales and helps respondents to understand their scores better. Step 4 helps respondents connect their most-developed intelligences to occupations related to the intelligence, college programs and majors, and tips for developing the intelligence. Respondents can then use that information to develop a plan to use and implement their stronger intelligences and find ways to overcome and improve their weaker intelligences.

Understanding and Interpreting *Work Smarts* Scores

Work Smarts yields content-referenced scores in the form of raw scores. A raw score, in this case, is the total of the numbers circled for each of the ten self-report intelligence statements for the eight scales. The performance of individual respondents or groups of respondents can only be evaluated in terms of the mean scores on each of the scales. For each of the scales on *Work Smarts,*

- **Scores from 10 to 16 in any scale are low** and indicate individuals have not fully developed this intelligence. They should consider other intelligences first when making career decisions.

- **Scores from 17 to 23 in any section are average** and indicate that individuals have somewhat developed the intelligence, but they should do more to further develop the intelligence.

- **Scores from 24 to 30 in any section are high** and indicate that individuals have developed this intelligence and that they should consider career options that make use of this intelligence and find ways to develop it even further.

Respondents generally have one or more areas in which they score in the high or high-average categories. Respondents should concentrate on exploring career and education opportunities related to these intelligences first. However, they should also look for ways to improve other intelligences that interest them, even if they have lower scores.

Keep in mind that intelligences are not mutually exclusive and that individuals may express high development in multiple intelligences (and thus have many high scores). If this is the case, consider discussing the individual's other interests—including hobbies and other leisure activities—to further explore which intelligences the individual has preferences for. Be aware that one goal of the assessment is to expand the career options of individuals by making them more aware of their most-developed intelligences. A respondent may be aware of his or her strengths, but may not be aware of how those strengths relate to his or her career.

Alternatively, some respondents may score in the average or low ranges for most or all of the eight intelligences. If such is the case, administrators should allow clients to explore the scale or scales on which they do score highest, have the clients explore specific occupations listed, and help the clients develop a plan for enhancing their highest intelligence. A profile in which all of the scores are in the low or average range may indicate that the test taker has simply not been exposed to situations for intelligence development. The "Tips for Developing This Intelligence" can be useful in helping clients gain self-esteem as they successfully complete the activities listed. It should be remembered that *Work Smarts* is not designed to pigeonhole clients into a category, but to see what possibilities exist for each of the intelligences.

Gardner believes that the eight intelligences he has identified are independent, in that they develop at different times and to different degrees in different people. They are closely related, however, and many career counselors find that when a person becomes proficient in one intelligence, other intelligences may be enhanced. For this reason, it is important that test takers be encouraged to explore and exercise all of their intelligences. Assessment administrators also need to be aware that some intelligences lend themselves to a wide variety of occupations, while others will have a more limited number of occupations that match their highest intelligence. It should be noted that most occupations actually require the use of multiple

intelligences, and test administrators must help their clients explore the interaction of their most-developed intelligences and their relations to career choices.

Illustrative Case

Stephanie is a college student at a mid-sized university in Delaware. She is the first person in her family to go to college. She has taken a variety of classes, hoping to find a major that is a natural fit for her. She does not feel like she has any "true" interests. She describes herself as average. Stephanie has already taken some of the traditional career assessments with very mixed results. Stephanie's scores on the *Work Smarts* assessment were as follows:

People Smart	**20**
Self Smart	**18**
Logic Smart	**14**
Picture Smart	**17**
Body Smart	**14**
Word Smart	**24**
Music Smart	**16**
Nature Smart	**15**

The results show Stephanie to favor linguistic intelligence, as Word Smart was the only scale with a score in the "high" range. After talking to Stephanie, she revealed that she does well in English and that she loves to read. She wrote a column for her high school newspaper and had thought about writing a book someday. Stephanie used the assessment to identify occupations of interest to her, including librarian, journalist, English teacher, and editor.

Stephanie's next-highest score was People Smart, suggesting that she is good at understanding and communicating with others. She revealed that she had thought about teaching, but did not want to work with small children. She said that teaching English in high school might be a great job. It was suggested that she could combine her two preferred intelligences to major in secondary teacher education with a specialization in English. The career counselor suggested that Stephanie talk with an academic advisor in that major and join the teacher education club on campus.

Research and Development

This section outlines the stages involved in the development of *Work Smarts*. It includes guidelines for development, item construction, item selection, item standardization, and norm development and testing.

Guidelines for Development

Work Smarts was developed to fill the need for a quick and reliable instrument to help people explore their most-preferred and least-preferred intelligences and then tie those intelligences to occupations. It also provides counselors and teachers with information that they can use to help their clients and students explore how to be more successful in the workplace by capitalizing on their strengths and working to enhance their weaknesses. *Work Smarts* was developed to meet the following guidelines:

1. **The instrument should measure a wide range of multiple intelligences.** To help people identify the strength of their multiple intelligences, eight scales were developed that were representative of the multiple intelligences identified by Gardner (1983, 1993) in the literature.

2. **The instrument should be easy to administer, score, and interpret.** *Work Smarts* uses a three-point Likert question-answer format that allows respondents to quickly determine their most-preferred and least-preferred intelligences. The consumable format makes it easy to complete, score, and interpret the assessment and helps people explore and apply their strongest intelligences in the workplace and learn effective ways to further develop their weakest intelligences.

3. **The instrument should apply to both men and women.** Norms for *Work Smarts* have been developed for both men and women.

4. **The instrument should contain items that are applicable to people of all ages.** Norms developed for *Work Smarts* show an age range from 17 to 62.

Scale Development

A thorough review of the professional literature was conducted to identify the multiple intelligences that people possess. The theory of multiple intelligences was developed in 1983 by Howard Gardner (1983) at Harvard University. Gardner's theory argued that intelligence, as it was traditionally defined, did not sufficiently encompass the wide variety of abilities that people possess. His theory—and subsequent writings about multiple intelligences—was used as the basis for scale development.

From this review of the literature on multiple intelligences, eight scales were developed. Figure 1 shows the comparison of Gardner's multiple intelligences and the scales of *Work Smarts*. It should be noted that Gardner has proposed other intelligences, but they have not yet been proven scientifically to be intelligences.

Item Selection

A large pool of items that were representative of the eight major scales on *Work Smarts* was developed and later revised, using many of the research studies cited previously. The items were tailored based on many of the research questions asked in these studies and the application of the intelligences in the workplace. The items selected for inclusion on *Work Smarts* were representative of the eight intelligences proposed by Gardner (1983). A pool of items was identified and then was subjected to a Split-Half statistical study (see Table 1) to eliminate items that did not cluster well. This enabled the elimination of items that did not correlate. In

Figure 1: Comparison of Gardner's Intelligences (1983, 1993) and *Work Smarts* Scales	
Multiple Intelligences	***Work Smarts* Scales**
Linguistic Intelligence	Word Smart
Logical-Mathematical Intelligence	Logic Smart
Spatial Intelligence	Picture Smart
Bodily-Kinesthetic Intelligence	Body Smart
Musical Intelligence	Music Smart
Interpersonal Intelligence	People Smart
Intrapersonal Intelligence	Self Smart

developing items for *Work Smarts*, the author used language that is currently being used in the literature related to multiple intelligences, abilities, and intelligence scores. After the items were developed, they were reviewed and edited for clarity, style, and appropriateness for identifying developed and underdeveloped intelligences. Items were additionally screened to eliminate any reference to sex, race, culture, or ethnic origin.

Item Standardization

Work Smarts was designed to measure a person's most-developed and underdeveloped intelligences and then use this information to help the person be successful in the workplace. The author identified two populations (high school students and adults) to complete drafts of *Work Smarts* to gather data concerning the statistical characteristics of each of the items. From this research, a final pool of 10 items was chosen that best represented each of the eight scales on *Work Smarts.*

This initial research yielded information about the appropriateness of items for each of the *Work Smarts* scales; reactions of respondents concerning the inventory format and content; and reactions of respondents concerning the ease of administration, scoring, and profiling of *Work Smarts.* Experts in the field of postsecondary education were used to eliminate items that were too similar to one another. The data collected was then subjected to split-half correlation coefficients to identify the items that best represented the eight scales on *Work Smarts*. The items accepted for the final form of *Work Smarts* were again reviewed for content, clarity, and style. Careful examination was conducted to eliminate any possible gender or race bias.

Reliability

Reliability is often defined as the consistency with which a test measures what it purports to measure. Evidence of the reliability of a test may be presented in terms of reliability coefficients and test-retest correlations. Tables 1 and 2 present these types of reliability information. As can be seen in Table 1, *Work Smarts* showed very strong internal consistency validity with split-half correlations ranging from .62 (People Smart) to .89 (Body Smart). All of these correlations were significant at the .01 level (see Table 1). Approximately one month after the original testing, 20 people in the sample population were retested (see Table 2). Test-retest correlations for *Work Smarts* ranged from .81 (Body Smart scale) to .93 (Nature Smart scale). All of these correlations were also significant at the .01 level.

Validity

Validity is often defined as the extent to which a test measures what it purports to measure. Evidence of validity for *Work Smarts* is presented in the form of means and standard deviations and stanine (standard nine) scores. Table 3 shows the scale means and standard deviations for men and women who completed *Work Smarts*. Note that women scored highest on the Word Smart scale (M = 24.60) and then the People Smart scale (M = 22.80). Women tended to have the least-developed intelligences in Music Smarts (M = 16.60) and Logic Smarts (M = 17.40). Men scored highest on the Body Smart (M = 24.01) and the Self Smart (M = 21.14) scales. On the other hand, men tended to have the least-developed intelligence in Music Smarts (M = 16.14) and Word Smarts (M = 16.86).
The overall population tended to score highest on the People Smart (M = 21.86) scale and lowest on the Music Smart (M = 16.36) scale. This seems to be consistent with societal norms and expectations in general; interpersonal interactions tend to be a critical life skill that people

are expected to learn, while music is mostly pursued by people who have a natural talent for it. In addition, a majority of occupations require some proficiency in People Smarts, while the number of occupations requiring Music Smarts is limited.

Stanine scores were also developed for each of the scales (see Table 4). As can be seen from this table, high school students tended to replicate the normal distribution of scores. Students tended to score about average ($X = 5$) on the Word Smart scale and slightly above average on the Body Smart ($X = 6$) and People Smart ($X = 6$) scales. They scored considerably above the mean on the Logic Smart ($X = 8$) scale. On the other hand, they scored below average on the Self Smart ($X = 3$) and Nature Smart ($X = 3$) scales. These scores indicate that high school students tend to have average development in Word Smarts, Picture Smarts, Music Smarts, Body Smarts, and People Smarts. They tend to have highly developed Logic Smarts and have underdeveloped Self Smarts and Nature Smarts. This suggests that high school students tend to focus more on traditional academic disciplines, with an emphasis on the logic and problem-solving necessary in math and sciences. It also suggests that Self Smarts—or intrapersonal intelligence—might not be as high a priority at this age level and will, instead, be better developed in adulthood.

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About the Authors

John Liptak, Ed.D., is one of the leading developers of quantitative and qualitative assessments in the country. He is the Director of Career Development at Radford University in Radford, Virginia. He provides career assessment and career counseling services for students and administers and interprets a variety of career assessments. Dr. Liptak focuses on helping students develop their careers by becoming engaged in a variety of learning, leisure, and work experiences. In addition to *Work Smarts*, Dr. Liptak has created the following assessments for JIST Publishing: *Career Exploration Inventory, Transition-to-Work Inventory, Job Search Knowledge Scale, Barriers to Employment Success Inventory, Job Search Attitude Inventory, Assessing Barriers to Education, Transferable Skills Scale,* and *College Survival and Success Scale.* He is also the author of *Career Quizzes.*

Paul Allen has more than 35 years of experience as an estimator in the construction industry. Paul's expertise in mathematical concepts, logical thinking, and spatial relations provided valuable insight into many of the intelligences measured and described by the *Work Smarts* assessment. Paul continues to remain actively involved in service projects for nonprofits and people in the community.

Table 1: Internal Consistency (Split-Half Correlations) *	
Scale	**Correlation Coefficient**
People Smart	.62 **
Self Smart	.87 **
Logic Smart	.85 **
Picture Smart	.84 **
Body Smart	.89 **
Word Smart	.80 **
Music Smart	.68 **
Nature Smart	.78 **

* N = 20

** Correlation significant at the 0.01 level

Table 2: Stability (Test-Retest Correlations) * +	
Scale	**Correlation**
People Smart	.91 **
Self Smart	.84 **
Logic Smart	.87 **
Picture Smart	.86 **
Body Smart	.81 **
Word Smart	.78 **
Music Smart	.92 **
Nature Smart	.93 **

* N = 50

+ 1 month after original testing

** Correlation significant at the 0.01 level

Table 3: Means and Standard Deviations for Adults						
Scale	**Total (N = 147)**		**Male (N = 77)**		**Female (N = 70)**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
People Smart	21.86	3.4	21.00	4.0	22.80	3.2
Self Smart	21.36	3.8	21.14	4.6	21.60	2.4
Logic Smart	18.39	4.1	19.29	5.2	17.40	5.3
Picture Smart	18.93	3.5	20.14	3.0	17.60	3.1
Body Smart	21.34	3.7	24.01	3.1	18.40	2.4
Word Smart	20.54	4.5	16.86	2.8	24.60	5.5
Music Smart	16.36	4.9	16.14	5.0	16.60	4.9
Nature Smart	19.27	4.7	18.43	4.9	20.20	4.2

Table 6: Stanine Scores for High School Students *	
Scale	**Stanine Score**
People Smart	6
Self Smart	3
Logic Smart	8
Picture Smart	4
Body Smart	6
Word Smart	5
Music Smart	4
Nature Smart	3

* N = 242