Vocational Evaluation and Career Assessment Professionals Test Review

Test Review: Raven's Standard Progressive Matrices

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Publisher: J. Raven. Oxford Psychologists Press Ltd., Published 1938, Revised 1956, Reprinted (eleven times) 1958-1994. Lambourne House, 311-321 Banbury Road, Oxford OX2 7JH England.

Contact/Purchase: J. Raven, J. C. Raven, J. H. Court. Pearson, 1998. P.O. Box 599700, San Antonio, TX 78259. http://www.ravensprogressivematrices.com/

Cost: Raven's SPM Kit-$206
Raven SPM Classic Easy Score Answer Sheet (10)-$30.50 Raven SPM Classic Test Booklet-$54.75
Raven SPM Ans Doc (50)-$56 Raven SPM Answer Key-$28.50
Each Manual Section-Sold Individually (General Overview-1998, Updated 2003)-$75 (Section one is necessary).
To order: Pearson. 19500 Bulverde Rd. San Antonio, TX, 78259. 888-298- 6227.
http://psychcorp.pearsonassessments.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=015-4686-76X&Mode=summary

Psychometric Properties

Purpose: Raven's Standard Progressive Matrices (SPM) is an instrument that measures fluid intelligence (Funham & Moutafi, 2012) and is used to assess persons 5 years or older (Power, 2006). The test can determine a person's present capacity for clear thinking and accurate intellectual work (Raven, Raven, & Court, 1998), which has uses in research, clinical, occupational, and educational settings. Within the clinical setting, the SPM is useful in flagging a number of disorders ranging from anxiety and depression to cerebral trauma (Raven, Raven, & Court, 1998). Although its intended uses do not include diagnosis, the SPM can alert clinicians to the possible presence of disorders. The usefulness of the SPM within occupational settings includes the capacity to assess clients' ability to find new ways of thinking about and completing tasks and predicting their ability to attain and retain jobs that require a high level of work capacity (Raven, Raven, & Court, 1998).

The SPM is composed of 60 visual patterns, each consisting of 4 squares inside a box, with one blank or missing piece. Below each pattern is a set of four smaller, although similar, patterns from which the client can choose. Only one pattern is the correct fit to the corresponding above pattern and the other three are distracters. The SPM is a power test.

Reliability and Validity: Burke (1985) stated that a correlation coefficient of .96 was found when a split-half test was conducted with 2,998 individuals referred for vocational counseling and psychiatric services. In a study of 256 cases in which the SPM was administered concurrently with other intelligence tests, there were substantial correlations. When compared to the Wechsler Adult Intelligence Scale-Full Scale (WAIS-FS), there was a correlation of .66, other correlations included the WAIS-V (.61), WAIS-P (.63), and Shipley (.69; Burke, 1985). Construct validity was demonstrated in a study by Rushton, Skuy, and Bons (2004). Item difficulty was measured and compared for Africans, East Indians, Whites, and others with a correlation of .90. Power (2006) states that the SPM "Measures the ability to perceive and use relationships between nonverbal materials" (p. 176). There is a clear association between test items and the correct answer that further demonstrates content validity of the SPM. Pind, Gunnarsdottir, and Johannesson (2003) compared scores from the SPM to national examination scores of 665 Icelandic 4th and 7th graders and found correlations of .5 and .75 for each group, respectively. They concluded the SPM is a good test of general ability that demonstrates concurrent validity.

Standardization: The raw scores of the data retrieved from Raven's SPM are compared to standardized percentages. This standardization is based on the studies conducted to gather norms for young people and older adults, geographical and cultural variance, and different time periods. Dr. Raven first standardized the SPM in England in 1938 and 1952 with both studies yielding similar results (Raven, 2000). In England during the mid 1940s, Raven used 3,665 adults aged 20-30 to standardize the SPM. Raven recruited fathers of the previously tested children and civilians and recruits from the British armed forces (Raven, 2000). These studies, those of the children in particular, confirmed the assumption of a general increase in scores since the originally published children's norms (Raven, 1990). Within the United States, Des Moines, Iowa was selected for a standardization site because it was reported to be one of the four areas within the United States that had a demographic composition closely approximating the U.S. as a whole. The group consisted of 625 schoolchildren, aged 6 to 16 with an equal representation of males and females. The racial makeup included 8% black, 87% white, and the majority of the remaining participants identifying themselves as of Hispanic or Asian decent (Raven, 1990).

Practical Evaluation

Administration: Raven's SPM is an untimed assessment that can be administered individually or to groups. Although the SPM can be self-administered (Raven, Raven, & Court, 1998), the evaluator must provide supervision to ensure understanding and monitor for errors that could potentially affect scoring: incorrect coding of answers could greatly affect the results. To begin, the evaluator opens the test booklet and directs the client's attention to the first example. The evaluator then begins to explain the format of the test, how the questions should be answered, and how an answer is deemed correct within the parameters of the test. The evaluator then provides an explanation as to why an answer is either correct or incorrect. After confirmation of understanding from the client, the evaluator holds up the book or places it in a position so that both can

see the booklet. Each item is then administered. When administered individually the client points to the selection he or she believes to be correct, the evaluator then asks the client for confirmation, and records the response on the answer sheet. The evaluator then tallies the correct responses after all questions have been answered. When self-administered, the client records his or her own answers. The resulting number or raw score is then compared to the average score for the client's age and a corresponding percentile can be used to determine the Grade Score, which ranges from one (equivalent to >95th percentile) or five (<5th percentile; Raven, 2000). Part of the supervision is to ensure the client's self- scoring is correct.

Both the total and individual scores need to be considered in the interpretation of the test results. The normal or average score for each section is standardized based on age and should be subtracted from the actual tallied score of that section. The resulting values should be no more than two, either positive or negative. Instances in which there are scores greater than plus or minus two indicate lack of face value for the total score and an inappropriate match between the test and client (Raven, Raven, & Court, 2000). In other words, the test and results would not be useful. However, the evaluator must also consider whether the instructions were not explained completely or clearly to the client.

Reviewer Comments

Populations Served/Not Served

The SPM is appropriate for use with many persons with disabilities including persons with learning disabilities, language disorders, mobility impairments, and cognitive disorders. The evaluator must consider the client's unique functional limitations in order to determine what, if any, types of accommodations need to be provided. One of the primary groups is clients with cognitive limitations. The evaluator may choose to administer this test as a means to assess a client's problem solving skills. In order to obtain useful results the evaluator needs to make sure that the individual has the capacity to understand the instructions and respond correctly.

For individuals with learning disabilities, additional time may be provided. Since the SPM is not a timed test, these clients from this population should be encouraged to take their time, which may not be afforded with other instruments. Also, prior to administering the test, ask clients what they have found to be their most effective test accommodation(s). Clients with communication difficulties, especially those with language disorders, need to be capable of communicating understanding in a manner other than orally, for example with a sign language interpreter or a gestural system. The important factor to consider is whether or not a client will be able to ask a question or indicate confusion so the evaluator can clarify the instructions and expectations.

For clients with mobility issues, the primary considerations are table height and building access. An alternate testing site may need to be provided. For example, if the individual cannot leave home, the evaluator needs to administer the test at the client's home. Use of an alternative site also requires the evaluator to consider factors ordinarily

controlled in an office environment. Visual distractions such as similar patterns on posters, rugs, etc, may affect the client's ability to concentrate fully on the test items and answers. Others distractions may include: tactile (bed sores), audial (dogs barking or intercoms), and olfactory (aroma of food being cooked and the client is hungry, strong cologne or perfume to a person with asthma, or other odors). The anxiety caused by having the testing performed in the client's home must also be considered. For clients with paralysis or impaired limb functioning, minimal challenge to administration should be presented. As long as the evaluator and the client agree on a method to respond and provide answers, no limb movement should be necessary.

The acuity of clients with visual impairments is an important determinant of accommodations. Clients with low vision may benefit from enlargement of test items. Other accommodations may be provided and include strategies such as offset test booklet placement to allow individuals with macular degeneration to utilize their peripheral vision or use of different types of lighting. This test is not appropriate for individuals who are totally blind or cannot access print.

In addition to the client's primary disability, the evaluator must also consider other factors such as the severity of the disability and the presence of other disabling conditions in order to provide effective accommodations. After the accommodation is provided, the evaluator scores the test. During this process, the evaluator must consider the functional limitations of the disability as well as the accommodation. If there are variances in the normal and individual scores, then the evaluator must determine the usefulness of the results. In the case of inconsistencies in the results, the evaluator may consider re-administration of the test or portions of the test.

The SPM seems to be a culturally fair instrument, with culturally neutral test items. The visual patterns have no known relation to any culture and do not appear to be representative of any symbols or items related to culture. However, as with any test, the evaluator must be sensitive to factors related to client's culture and ensure no offense is taken with the test or test taking process.

Summary Evaluation

The strengths of this test are ease of use for the evaluator and the client and efficiency (short completion time). The SPM administration instructions are clear and the format for administration ensures that clients understand what is expected of them. The SPM is less daunting than other tests that consist of number problems, true false questions, essays, etc. The SPM is user friendly because it seems more like an activity or puzzle than a test. Scoring and administration are relatively easy for the evaluator because scoring involves simple math. The SPM can also be used with a variety of populations, including people with disabilities.

The test booklet is comparable in size and feel to a professional journal; more durable when compared to a magazine with pages that are thick enough so as not to fray or tear easily through standard use. The items in the test booklet are clear, concise, and large enough that clients with low vision can detect the difference in patterns. The answer

choices are also sufficiently large to help the client differentiate between the separate possible answers, thereby reducing possible confusion. The test items are black and white, removing any distracters related to color, which could detract from the focus on patterns.

One significant problem with the SPM is that it is one dimensional as regards the construct being tested. A client's intelligence comprises more than the ability to match patterns and the SPM should be used in tandem with other instruments to develop a holistic picture of functioning.

The relative ease of use for client and evaluator, the variety of populations with which the SPM can be used, and psychometric properties are all positive indicators in favor of adapting the SPM in the evaluator's tool box. The caveat is to use the SPM, like any other test, in combination with other instruments to insure an accurate evaluation is completed.

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