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Review of the Identi-Fi: A Test of Visual Organization and Recognition by Ryan J. McGill, Associate Professor of School Psychology, William & Mary School of Education, Williamsburg, VA:

Description

The Identi-Fi: A Test of Visual Organization and Recognition (Identi-Fi; Reynolds & McCaffery, 2020a) is an individually administered test of visual organization skills that was designed to provide continuity of measurement for examinees ages 5 to 79 years and is purported to overcome several measurement concerns with existing visual recognition instrumentation. Specifically, it is suggested in the Professional Manual (Reynolds & McCaffrey, 2020b) that "Existing measures of visual organization are either quite dated, have scores with relatively poor reliability, and/or are confounded by speed and fine motor requirements, making their interpretation extremely difficult" (pp. 1-2). To wit, much of the introductory section of the Manual is dedicated to outlining the different ways in which visual organization has historically been measured in psychological science as a neuropsychological skill and highlighting potential limitations due to the introduction of construct irrelevant variance in such tasks.

The Identi-Fi is composed of two subtests: Visual Recognition (VR) and Visual Matching (VM). In the VR measure, examinees are presented with pieces of a cut-up illustration of a picture representing a common object, animal, or body part. In the VM subtest, examinees are presented with the same illustrations from the VR task, in the same order, and must identify the correct assembly of that picture from an array of distractor items. Both subtests combine to form a global Visual Organization Index (VOI) score. Each subtest contains 30 items and examinees

are required to complete all of the items in each measure in the same sequential order (i.e., there are no basal or ceiling rules). It is estimated that the administration of the two tasks should take approximately 10 minutes. Finally, the Identi-Fi was also co-normed with the Trails-X (Hartman & Reynolds, 2019), a traditional trail-making task with additional demands on executive functioning skills previously developed by the same test publisher.

Development

The Identi-Fi was developed with several goals in mind. First, as many existing measures of visual processing require complex motor skills, it was deemed necessary to develop a series of domain-specific measures that eliminate or greatly reduce construct irrelevant variance (i.e., verbal responding or use of complex manipulatives). Relatedly, Identi-Fi measures are reported to not be overly saturated with variance attributable to the general factor of intelligence which permits the evaluation of a complex functional system of the brain without contamination from other domain-irrelevant systems. As such, interpretation of performance on the measure is more straightforward. Finally, the Identi-Fi provides users with up to date stimuli in full color; by contrast, other existing measures often feature black and white illustrations.

Initially 56 objects were Identified for potential inclusion in the test based on consideration of bias, cultural loading, and the frequency in which items are likely to be encountered across different academic subjects. Using these data, items were ordered sequentially from most to least commonly used words. Next, each item was illustrated and then cut in varying degrees of difficulty featuring different combinations of three horizontal and/or vertical sections. Pilot data were collected from a national sample of 51 participants from 2016 to 2017 and classical test theory analyses were used to evaluate item performance and difficulty. As a result of these analyses, 13 items were removed and the remaining items were re-ordered based on the observed difficulty level.

The Identi-Fi can be administered individually either in-person or remotely featuring a separate remote e-stimulus book. Specific information related to the psychometric integrity of the remote version is not reported in the Manual; however, users are directed to a publisher commissioned white paper (Reynolds et al., 2021) in the *Remote Guide* reporting that there were no compelling statistical differences in the mean scores among individuals who were administered an in-person version of the test compared to remote participants. While the test publisher should be lauded for conducting this investigation in light of the pandemic, such evidence is considered a preliminary form of equivalence within the psychometric canon (Farmer et al., 2020). It should be noted that the same record form can be used across administration forms. To help facilitate confidant administration and interpretation of the instrument, the Manual features an illustrative case example and the test kit also contains a remote administration and scoring guide as well as a Fast Guide summarizing key administration and scoring procedures.

Technical

Standardization

The Identi-Fi standardization normative sample contained 901 participants ranging in age from 5 to 79 years and was stratified into 18 different age groupings (age groups range from 1 to 5 years). Inspection of the demographic tables reported in the Manual reveal close approximations to the age, gender, and ethnicity estimates obtained from 2017 U.S. Census data. Normative data was obtained from participants in 32 states.

Subtest scores are expressed as *T* scores ($M = 50$, $SD = 10$, range = 145 to 40) with lower scores indicating degraded visual recognition ability. The VOI composite is expressed as a standard score ($M = 100$, $SD = 15$, range = 40 to 80). According to the Manual, VOI scores that fall below 84 (*T* score equivalent is 39) are indicative of some degree of impairment ranging

from *Mild* to *Severe*. In terms of clinical interpretation, examiners are encouraged to focus most, if not all, of their interpretive weight on the omnibus VOI score with additional consideration of subtest performance employed with caution. Nevertheless, base rates for subtest-level discrepancies are provided as a means for generating clinical hypotheses if significant variability between the subtests is observed.

Reliability

Multiple forms of reliability evidence for Identi-Fi scores are reported in the Manual. Internal consistency estimates for the entire normative sample ranged from .83 to .86 for the VR and VM tasks respectively. Although these overall estimates are somewhat acceptable, the coefficients associated with each of the age brackets were considerably lower. For example, the internal consistency estimate for the VOI at age 11 is .79 which falls well below consensus standards (i.e., $\geq .90$) for high stakes decision making. The overall estimate for the VOI composite score was .90. Standard error of measurement values were acceptable and ranged from 3.74 to 5.29 across the age span. Whereas average test-retest correlations ranged from .49 to .71 indicating weak to moderate consistency, corrected coefficients were somewhat higher ranging from .68 to .85. Though, the sample in that study was limited to 27 participants with an average retest interval of only 30 days.

Validity

As per the Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014), evidence for validity was structured around the areas of test content, internal structure, relations with external measures, and diagnostic utility. Due to the fact that the implied measurement model for the Identi-Fi is mathematically under Identified, evaluation of internal structure was limited to interpreting the correlation between the VR and

VM measures. Across the age span, the correlation between the VR and VM measures ranged from .55 to .58. Concurrent validity with one of the most commonly utilized visual organization tests (Hooper, 1958) was moderate (-.48 to -.65 [negative correlations are due to inversion of score comparisons across the measures]). Examination of performance on the Identi-Fi by clinically identified special groups were used to test for specific clinical studies' differences. Mean scores across the groups were typically what one would expect with individuals diagnosed with various conditions (e.g., dementia, intellectual disability, traumatic brain injury, learning disability, ADHD) indicating Identi-Fi scores were significantly lower among the clinical groups when compared to the average scores from participants in the normative sample.

Commentary

As with any test, the Identi-Fi has strengths and weaknesses. In terms of strengths, the inclusion of information in the Manual related to the calculation of reliable change indices corresponding to retest information on various Identi-Fi scores is a welcome addition to typical test record forms. Additionally, the classification accuracy statistics reported in Appendix G (pp. 73-93) are noteworthy as they provide the statistical basis for the estimates associated with the nominal labels for describing scores reported in the Manual as well as optimal raw score cutoffs for specific clinical populations. Such indices are informative for advancing the evidence-based assessment approach espoused by Youngstrom and colleagues (2015).

However, it remains unclear whether the omnibus VOI score represents given that the test is largely atheoretical and the implied hierarchical measurement model is under identified from a structural validity perspective. As such, additional research is needed to determine whether the composite score represents a viable psychological dimension (i.e., a general factor of visual recognition) or is more correctly thought of as a formative construct created by merely summing together performance on the VR and VM subtests. To be fair, there is nothing inherently wrong

with the creation of pseudo composites, they can still be useful for screening and predicting important external outcomes; yet, they are devoid of psychological meaning absent compelling theoretical justification and verification via an established nomological network. Finally, base rates are provided that permits users to determine whether there are significant discrepancies between performance on Identi-Fi and Trails-X scores. However, the Manual does not contain any information related to the use of those comparisons and thus, it remains unknown how users are to utilize this information. Though, it should be noted that the publisher should be commended for their transparency in highlighting the psychometric limitations associated with these discrepancy analyses throughout the Manual.

Summary

Overall the Identi-Fi has many strengths. The test is easy to administer and score and the remote testing option is likely to be of interest to users working in clinical settings where tele-assessment is needed to complete a comprehensive evaluation of an examinee throughout the lifespan. Strengths and limitations of the instrument are transparently articulated in the Manual. If examiners take those factors into consideration, the Identi-Fi may serve as a useful addition to their clinical tool kit.

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