Gifted Assessments and Underrepresented Students: What is the Best Means of Assessment?

Julie Kim
kim2152@purdue.edu

Madeline Gavin
gavinm@purdue.edu

Follow this and additional works at: https://docs.lib.purdue.edu/purc

Gifted Assessments and Underrepresented Students: What are the Best Means of Assessment?

Madeline Gavin & Julie Kim
Undergraduate Research Trainees

PURDUE UNIVERSITY

Undergraduate RESEARCH Training Program

Introduction

STATEMENT OF THE PROBLEM

- **Underrepresentation of gifted students at the elementary level** is an issue that is commonly overlooked. Many factors, such as teachers' traditional views of giftedness, along with societal biases, can contribute to underrepresentation.

- **For future educators**, understanding the characteristics of gifted students and being knowledgeable about the measures and approaches that are appropriate for identification purposes is key to providing students with teaching that meets their needs.

- However, evidence from a large sample of talent specialists (N=2,918, classroom teachers, and administrators; Renzulli, & Siegle, 2005), indicates:
  - lack of consensus on the best way to identify gifted students
  - general consensus that giftedness is something that should be tested by using assessments that address different criteria.

THEREFORE, it is critical that we examine assessments currently used at the elementary level in order to document their appropriateness for different age groups, as well as for students from culturally and socioeconomically diverse backgrounds.

DEFINITION AND ASSESSMENT OF GIFTEDNESS

Giftedness, as defined by the National Association for Gifted Children, is described as "when [children's] ability is significantly above the norm for their age," meaning students could be seen as being gifted in many different domains such as "intellectual, creative, artistic, leadership, or in a specific academic field such as language arts, mathematics or science" (NAGC, n.d.).

Purpose

In this review, we evaluate the purpose and technical characteristics of the following six assessments that are currently used to assess giftedness:

- Stanford Binet
- Wechsler-Bellevue Intelligence Scales for Children
- Woodcock-Johnson Test of Cognitive Abilities
- Hope Scale
- Naglieri Nonverbal Ability Test
- Cognitive Abilities Test

Abstract

In the elementary level, the issue of underrepresentation of gifted students is commonly overlooked. Although we recognize that this issue is multi-determined, we focus on assessments that are currently used and might be considered ideal for detecting giftedness in elementary school students. Through detailed evaluation of six quantitative and qualitative assessments, we examine factors that may limit each assessment's accuracy at identifying gifted students. Our analysis highlights how each assessment gauges giftedness by addressing the purpose of each assessment, its uses, and psychometric features. We suggest that multiple means of assessment may be the best way to accurately identify gifted students from culturally and economically diverse backgrounds. Incorporating a mix of both quantitative and qualitative assessments in the identification process is needed to reflect the multi-potentiality of students' giftedness. Our findings have implications for practice, as well as for the development and use of these assessments for research purposes.

Approach

Identification of Sources

- Conducted searches primarily from the following databases: Education Resources Information Center, ResearchGate, and SAGE Journals
- Used only published studies on the assessments of interest for giftedness
- Limited the search to sources that were published after the year 2000 to compare recent research studies on popular gifted assessments

Evaluation Criteria

Within our thematic review, we aim to evaluate the strengths and weaknesses of prominent and varying assessments for giftedness.

Specifically, we address:

- The purpose of each assessment
- How each assessment is used and what it measures
- The technical characteristics (i.e., the reliability evidence) of each assessment
- Each assessment's appropriateness for identifying diverse gifted students that may be underrepresented within the gifted community

Analysis and Interpretation of Findings

	Audience	Purpose	Methods	Reliability	Results
Stanford Binet Intelligence Scale (SBIS)	"Used by the general population and can be administered to subjects of almost all ages" (Uhry, 2014).	Measures children's general intelligence and cognitive abilities.	Scales that assess students' verbal and non-verbal skills to accommodate students whose giftedness may not be shown through verbal assessments.	There is an accurate internal consistency report.	Provides students with an intelligence quotient (IQ) score.
Wechsler-Bellevue Intelligence Scale (WISC)	Children between the ages of 6 to 16.	Form of measuring IQ; can also be used as "a clinical tool to measure individual cognitive abilities" (Weschsleriqtest, n.d.).	Students are given a verbal assessment .	Derived using three methods: internal consistency, test-retest (stability), and interscorer agreement. The average coefficients for the composite scores for the 11 age groups was .88 to .96. The Full Scale IQ (FSIQ) for the test-rest (stability) had an overall coefficient of .91; individual subtest reliability ranged from .63 to .91. Lastly, the interscorer agreement ranged from .97 to .99, an extremely high score (Canivez & Watkins, 2016).	• First Index: Shows students' ability to understand "visual details and relationships in order to solve puzzles and construct geometric designs" (Weschsleriqtest, n.d.). • Second Index: Reflects students' ability to "detect relationships among visual objects" (Weschsleriqtest, n.d.), tests for qualitative and quantitative reasoning skills. • Third Index: Tests for students' abilities to "register, maintain, and manipulate visual and auditory information" (Weschsleriqtest, n.d.). • Fourth Index: Assesses the time it takes a student to accurately make a decision and involves questions that related to matching symbols to associating numbers. • Fifth Index: Measures a child's verbal reasoning skill. After gathering the data from the five index scores, the final score is based on "statistical values such as the mean and the standard deviation" (Weschsleriqtest, n.d.)
Woodcock-Johnson Tests of Cognitive Abilities (WJ)	Students of all ages.	Assesses achievement, cognitive abilities, and oral language both individually or together in a variety of combinations.	Comprised of three parts, "r "batteries. Each battery consists of 10-12 tests that break up more specific ideas within the general scope of reading, writing, math, and academic language.	Formed using the test-retest method, with the retest interval set as one day. The correlation coefficients for the test-retest method was mostly within the .80 to .90 range, meaning there is a strong correlation within the data (Madle, 2017).	Three main types of scores: level of development, comparison with peers, and degree of proficiency Level of development includes: age and grade equivalents, comparison with peers includes standard score percentile rank, and degree of frequency.
Hope Scale	Students in grades kindergarten through twelfth.	Evaluates students within social and academic domains of giftedness to improve the underrepresentation of diverse gifted students.	Teachers evaluate students with an 11-item scale.	There is consistent reliability with the academic subscale producing an alpha level of 0.96 and the social subscale producing an alpha of 0.92 (Peter & Gentry, 2013).	Students receive a teacher rating for each of the 11 items based on 6 Likert-type rating scales within each item.
Naglieri Nonverbal Ability Test (NNAT)	Students in grades kindergarten through twelfth.	Identifies students' logic, spatial reasoning skills, and ability to identify patterns.	Students are given the nonverbal assessment by an administrator.	Reliability coefficients and standard errors are consistent for White, African American, and Hispanic students (George, 2001).	Students receive a standard score called the Naglieri Ability Index (NAI) where results of individual students is compared to other students of the same age.
Cognitive Abilities Test (CogAT)	Students in grades kindergarten through twelfth.	Measures students' reasoning abilities through verbal, nonverbal, and quantitative reasoning questions.	Students are given the assessment by an administrator .	Internal consistency is evident, but more studies are needed to see reliability over time.	Students receive a score based on their age and grade level. This score is presented in a score profile, which includes a Raw Score, Universal Scale Score, and a Standard Age Score.

Conclusions and Future Directions

The assessments reviewed here provide views of giftedness from different angles. We found that:

- Assessments vary with respect to which they take into account different aspects of giftedness, including intelligence, cognitive skills, reasoning abilities, as well as functioning within both social and academic domains.
- Most assessments are based on student responses, whereas one measure (the HOPE Scale) uses information from teachers who are asked to evaluate students on social and academic domains.
- Both verbal and nonverbal scales have been constructed, making it possible to assess different aspects of giftedness.

There is no clear consensus for which assessment is the most effective in identifying diverse gifted students, as each assessment was effective and strong in measuring different aspects of giftedness. While we did find assessments, like the Naglieri Nonverbal Ability Test, that showed consistency between the scores of students of different ethnicities, we believe that the HOPE Scale shows the greatest promise for the identification of diverse gifted students. We conclude this, as the HOPE Scale measures both social and academic aspects of giftedness and shows a consistent reliability with teacher evaluations.

However, we believe that multiple means of assessment that take into account the different aspects of giftedness may be the best way to accurately gauge gifted qualities of students who are both culturally and economically diverse.

References:

Brown, S.W., Renzulli, J.S., Jean Gubbins, E., Siegle, D., Zhang, W., & Chen, C.-H. (2005). Assumptions Underlying the Identification of Gifted and Talented Students. *Gifted Child Quarterly*, 49(1), 68-79. https://doi.org/10.1177/001698620504900107

Canivez, G. L. (2017). [Test review of Woodcock-Johnson® IV]. In J. F. Carlson, K. F. Geisinger, & J. L. Jonson (Eds.), The twentieth mental measurements yearbook. Retrieved from http://marketplace.unl.edu/buros/

Canivez, G. L., & Watkins, M. W. (2016). Review of the Wechsler Intelligence Scale for Children-Fifth Edition: Critique, commenary, and independent analyses. In A. S. Kaufman, S. E. Raiford, & D. L. Coalson (Authors), Intelligent testing with the WISC–V (pp. 683–702). Hoboken, NJ: Wiley

Erwin, J. O., & Worrell, F. C. (2012). Assessment Practices and the Underrepresentation of Minority Students in Gifted and Talented Education. *Journal of Psychoeducational Assessment*, 30(1), 74–87. https://doi.org/10.1177/0734282911428197

George, C. E. (2001). The Naglieri Nonverbal Ability Test: Assessment of cross-cultural validity, reliability, and differential item functioning (Doctoral dissertation, Fordham University, 2001). Dissertation Abstracts International, 62, 6018.

Houghton Mifflin Harcourt. (2014). Introducing the Woodcock-Johnson IV. Woodcock-John IV Preview, 1. Retrieved from https://www.hmhco.com/~/media/sites/home/hmh assessments/clinical/woodcock-johnson/pdf/wjiv/wj_iv_author_newsletter_winter_2014.pdf?la=en

Lohman, D. F. (2005b). Identifying academically talented minority students. Storrs: University of Connecticut, The National Research Center on the Gifted and Talented.

Madle, R. A. (2017). [Test review of Woodcock-Johnson® IV]. In J. F. Carlson, K. F. Geisinger, & J. L. Jonson (Eds.), The twentieth mental measurements yearbook. Retrieved from http://marketplace.unl.edu/buros/

Naglieri, J. A. (November 2018). "Practical Solutions to Identify All Gifted and Talented Students." NAGC Annual Convention. November 15-18, 2018, Minneapolis, MN.

Naglieri, J. A. & Ford, D. Y. (2005). Increasing minority children's participation in gifted classes using the NNAT: A response to Lohman. *Gifted Child Quarterly*, 49(1), 29-36. DOI: 10.1177/001698620504900104

Peters, S. J. & Gentry, M. (2013) Additional validity evidence and across-group equivalency of the HOPE teacher rating scale. *Gifted Child Quarterly*, 57, 85-100. https://doi.org/10.1177/001698621246253

National Association for Gifted Children. (n.d.). *What is Giftedness?* Retrieved from http://www.nagc.org/resources-publications/resources/what-giftedness

Peters, S. J. (2009). *Practical instrumentation for identifying low-income, minority, and ethnically diverse students for gifted and talented programs: The HOPE Teacher Rating Scale* (Doctoral Dissertation). Retrieved from ProQuest Dissertations and Theses Database. (UMI Number: 3379711)

Peters, S. J., & Gentry, M. (2010). Multigroup construct validity evidence of the HOPE Scale: Instrumentation to identify low-income elementary students for gifted programs. *Gifted Child Quarterly*, 54(4), 298-313. https://doi.org/10.1177/0016986210378332

Stanford-Binet Test. (n.d). How Reliable is the Stanford-Binet Test? *Stanford-Binet Test*. Retrieved from https://stanfordbinettest.com/all-about-stanford-binet-test/how-reliable-stanford-binet-test

Uhry, A. (2014). The Stanford-Binet Intelligence Scale: An IQ Test Unlike Any Other. *Noodle*. Retrieved from https://www.noodle.com/articles/to-iq-test-or-not-to-iq-test-more-on-the-stanford-binet-intelligence-scale

Weschsleriqtest. (n.d). Wechsler Intelligence Scale for Children (WISC). *PB International*. Retrieved from https://wechsleriqtest.com/wechsler-intelligence-scale-for-children/