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Abstract

Validity studies with the Reynolds Intellectual Ability Scales (RIAS) indicate that RIAS Composite Intelligence Index (CIX) and Verbal Intelligence Index (VIX) scores have moderate to high correlation with comparable scores on other instruments. The authors of the RIAS describe the VIX scale as a measure of crystallized ability and the Nonverbal Index (NIX) as a measure of fluid ability, but no studies are available comparing the VIX and NIX scores with an established measure of these abilities. And, no studies specifically addressed the utility of the RIAS with a university population. The current study examined RIAS scores of university students in comparison to scores on the Woodcock-Johnson Tests of Cognitive Ability, Third Edition (WJ-III). Consistent with previous studies, there were moderate to high correlations between the CIX and VIX scores and corresponding scores on the WJ-III. A substantially lower correlation was evident between the NIX and WJ-III fluid ability scores.

Keywords: University Students, RIAS, WJ-III, Assessment, Intelligence, Convergent Validity

Convergent Validity of the Reynolds Intellectual Assessment Scales (RIAS) Using the Woodcock-Johnson Tests of Cognitive Ability, Third Edition (WJ-III) With University Students

University students require intelligence testing for a variety of reasons. The most obvious one is to identify the possibility of a disability (Ofiesh & McAfee, 2000). Although most learning disabilities are diagnosed before a student arrives at college, some receive their initial diagnosis during their university experience (Morgan, Sullivan, Darden, & Gregg, 1997). In addition, intelligence testing has been used with university students in the diagnosis of other disabilities such as Attention Deficit Hyperactivity Disorder (Biederman, et al., 1993). Specifically, intelligence tests are often needed to rule out cognitive disorders when making a differential diagnosis (American Psychiatric Association [APA], 1994). In addition to testing intelligence for diagnostic purposes, intelligence test scores are frequently used in career counseling (Carson, 1996). Therefore, when a new intelligence test becomes available, it is important to investigate the psychometric properties and theoretical structure of that test specifically in reference to a university student population.

The Cattell-Horn Carroll theory of intelligence (CHC) posits a three-stratum hierarchy of cognitive abilities organized along a continuum from broad to narrow (Shrank, Flanagan, Woodcock, & Mascolo, 2002). The CHC model has roots in the theories of Fluid and Crystallized Intelligence (Gf-Gc theory) developed by Raymond Cattell and John Horn (Cattell, 1963; Horn, 1968; Horn 1985; Horn & Cattell, 1966) and the Three-Stratum theory of intelligence developed by John Carroll (Carroll, 1993). Additional details about the development of the CHC model are available in McGrew and Woodcock (2001) and Flanagan and Harrison (2005).

The CHC model provides a theoretical framework for several intelligence test batteries currently used in clinical and psychoeducational assessments, including the Stanford-Binet Intelligence Scales, Fifth Edition (SB5) (Roid, 2003) and the Kaufman Assessment Battery for Children, Second Edition (KABC-II) (Kaufman & Kaufman, 2004). Although, some feel that Wechsler scales sufficiently described cognitive function without a basis in CHC (Kaufman, Lictenberger, & Naglieri, 1999), the newer Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV) includes scales that appear to be more consistent with CHC constructs (Wechsler, 2003).

Of the instruments associated with CHC theory, the Woodcock-Johnson-III Tests of Cognitive Abilities (Woodcock, McGrew, & Mather, 2001) is most prominent. This test was designed as a direct measure of CHC concepts. Confirmatory factor analyses have consistently found factor structures that would be expected for a measure claiming to evaluate based on CHC theory (McGrew & Woodcock, 2001; Taub & McGrew, 2004).

One of the newer intelligence tests, the Reynolds Intelligence Assessment Scales (RIAS), was developed using the idea that both verbal and nonverbal intelligence contributes to the formation of general intelligence (g) (Reynolds & Kamphaus, 2003). The authors defined verbal and nonverbal intelligence as analogous to crystallized (Gc) and fluid intelligence (Gf), respectively as defined by Horn and Cattell (1966). The inclusion of g in the RIAS theoretical model is similar to both Three Stratum theory (Carroll, 1993) and CHC theory (Flanagan & Harrison, 2005). Given the current use of CHC theory for test development and interpretation described above, the assessment of g, Gc, and Gf, creates the intriguing hypothesis that the RIAS might provide a good partial measure of CHC theory. It is, therefore, important to determine the extent to which the RIAS demonstrates convergent validity with an established measure of CHC

theory. To date, a convergent validly study has not been conducted using the RIAS with a CHC measure.

One of the stated goals of the RIAS was to provide an efficient measure of intelligence that yields reliable and valid scores of these three specific constructs in a shorter period of time (Reynolds & Kamphaus, 2003). The RIAS takes about half the time to administer when compared to the Wechsler scales, KABC-II, or the SB5. Given the brevity of the instrument, more and more practitioners are moving away from the longer, more time consuming instruments in favor of the shorter, briefer RIAS (Reynolds & Kamphaus, 2003; H. Lippard, personal communication, October 10, 2008; R. Johnston, personal communication, January, 2004; A. Sifford, personal communication April 14, 2008). This leaves the question as to whether the RIAS can successfully meet the goals of measuring Gc, Gf, and g as well as the longer scales in a university student population.

Convergent Validity

The RIAS manual does not include studies comparing performance with instruments directly based on CHC theory or studies using only university student samples. Instead, studies reported in the manual compared RIAS performance with scores on the Wechsler Intelligence Scale for Children-Third Edition (WISC-III) and Wechsler Adult Intelligence-Third Edition (WAIS-III). Correlation coefficients between the RIAS Composite Intelligence Index (CIX) and the WISC-III and WAIS-III Full Scale IQ scores were .76 and .75, respectively. Correlation coefficients between the RIAS Verbal Intelligence Index (VIX) and the WISC-III and WAIS-III Verbal IQ (VIQ) scores were .86 and .71, respectively. The relationship between the RIAS Nonverbal Index (NIX) and the WAIS-III Performance IQ (PIQ) was also in the moderate/high range, $r = .71$.

However, the reported relationship between the RIAS NIX and the WISC-III PIQ was only .33.

It should be noted that each of these validity studies had some limitations. First, the sample sizes were small. For the WISC-III to RIAS study, the sample contained 54 children with a mean age of 10.57 years of age. For the WAIS-III to RIAS comparison, the sample contained 31 adults with a mean age of 38.32 years old. Bracken and Schraw (2005) described other concerns about the manual's convergent validity data. In addition to the small samples, they describe possible problems of an over-inflation of the correlations due to an uncorrected range of scores. Also, there was some discussion that the correlations between the NIX were oddly higher with the verbal composite on the WISC-III ($r = .60$) than with the nonverbal composite on the WISC-III ($r = .33$) indicating that the NIX may be a better predictor of verbal rather than nonverbal ability.

Since the publication of the RIAS, several other validity studies have been conducted. The first study conducted by Beujean et al. (2006) compared the scores of the Scholastic Aptitude Test (SAT), which they described as an IQ test, to those obtained on the RIAS. They found that the SAT Verbal and Total scores were significant predictors of CIX; however, SAT Math scores were not as accurate as predictors. Their sample was larger ($n = 97$) than those listed in the RIAS manual and related to the university student population of interest (age range was 18 to 23 years old); however, their methodology of using the SAT as an intelligence test was not well supported. In addition, the assessment of the RIAS as a CHC measure was not possible given the data provided in the study.

McChristian, Windsor, and Smith (2007) compared RIAS and WISC-III performance using a sample of students referred for special education. The correlation between VIX to VIQ

scores was .73; the correlation between NIX and PIQ scores was .44; the correlation between CIX to FSIQ scores was .67. The average age of students in the study was 12 years, 3 months old.

Edwards and Paulin (2007) examined the RIAS with the WISC-IV also using a referred student sample of younger children (mean age = 8.22 years old). The correlation between CIX and FSIQ scores was .90, between the VIX and VCI scores was .90; and between the NIX and Perceptual Reasoning Index (PRI) scores was .72. The stronger relationship between the Wechsler scale and the NIX evident in this study may be attributed to a significant change in the design of the nonverbal scale in the newer WISC scale.

Findings from the previously described studies can be reviewed on Table 1. None of these studies directly address the relationship between RIAS scores and performance on a scale specifically designed to measure Gf, and Gc as part of an established CHC measure. In addition, none of the previous research studies has directly explored the utility of scores on the RIAS with a university student population. The current study examines both of these questions.

Method

Participants

A total of 107 undergraduate students attending an urban university in the southwestern portion of the United States participated in the study. All participants were volunteers completing a research requirement as part of an undergraduate course in educational psychology. Volunteers had the option of participating in several different projects. Most of the subjects (n = 89 or 83%) were education majors, with specialties in continuing education (n = 1), early childhood education (n = 4), elementary education (n = 46), health/ physical education (n = 5), music education (n = 5), secondary education (n = 20), general education (n = 4), workforce education

(n = 1), and special education (n = 3). The other subjects (n = 18 or 17%) were seeking degrees in counseling (n = 3), criminal justice (n = 3), dental hygiene (n = 3), psychology (n = 4), social work (n =2), social science (n = 1), and theater (n =1). One participant reported being undecided.

Of the 107, 21 (20%) were male, 86 (80%) were female. Of the sample, 98 (92%) listed English as their primary language, 4 (4%) listed Spanish, and 5 (4%) listed languages other than English and Spanish as their primary language. With regard to academic standing, 1 (1%) was classified as a freshman, 26 (24%) classified themselves as sophomores, 55 (51%) classified themselves as juniors, 23 (22%) classified themselves as seniors, and 2 (2%) classified themselves as graduate/professional students. Students ranged in age from 18 to 56 years (M = 23.90, SD = 6.72). The ethnic breakdown of education students during the period of data collection was 60.1% Caucasian, 11.4% Latino, 8.1% African American, 6.4% Asian, and 14.0% other.

Instruments

The Reynolds Intellectual Assessment Scales (RIAS; Reynolds and Kamphaus, 2003) is an individually administered measure of general intelligence, verbal intelligence, nonverbal intelligence, and memory designed for use with people ages 3 years to 94 years. The core battery consists of four subtests, which produce composites of general intelligence g, verbal intelligence, and non-verbal intelligence. The Composite Intelligence Index (CIX) is a measure of general intelligence g derived from the Verbal Reasoning, Guess What, What's Missing, and Odd Item Out subtests. The Verbal Intelligence Index (VIX) representing verbal intelligence is derived from the Verbal Reasoning and Guess What subtests; the Nonverbal Intelligence Index (NIX) represents nonverbal intelligence and is derived from the What's Missing and Odd Item Out

subtests. The four-subtest core battery was administered to all subjects according to instructions outlined in the examiner's manual.

As reported by the RIAS manual (Reynolds & Kamphaus, 2003), internal consistency reliability coefficients (Cronbach's Alpha) across the entire age range for the RIAS on the index scores were high, with no median score below .94. Total sample test-retest stability estimates, derived from over a period ranging from 9 to 39 days between testing, for the CIX, VIX, and NIX were .86, .91, and .86 respectively.

The Woodcock-Johnson Tests of Cognitive Ability-Third Edition (WJ-III; Woodcock, McGrew, & Mather, 2001) is an individually administered measure of general intellectual ability g and specific cognitive abilities in people age 2 years through 94 years old. The battery yields a General Intellectual Ability index (GIA) that is a measure of g along with scores representing up to seven broad CHC abilities, including Comprehension-Knowledge (Gc), Long-Term Retrieval (Glr), Visual-Spatial Thinking (Gv), Auditory Processing (Ga), Fluid Reasoning (Gf), Processing Speed (Gs), and Short-Term Memory (Gsm).

For the purposes of this study, a nine-subtest battery was employed. Specifically, subtests 1-7 (Verbal Comprehension, Visual-Auditory Learning, Spatial Relations, Sound Blending, Concept Formation, Visual Matching, and Numbers Reversed) as well as subtest 11 (General Information) and subtest 15 (Analysis-Synthesis) were administered. This configuration produces three standard scores of primary interest in the subsequent analyses: General Intellectual Ability (GIA) considered to be a measure of g; Comprehension-Knowledge (Gc), which measures a construct analogous to crystallized ability; and Fluid Reasoning (Gf), which measures a construct analogous to fluid ability (McGrew & Woodcock, 2001).

As reported by the WJ-III manual (McGrew & Woodcock, 2001), internal consistency reliability coefficients across the entire age range for the WJ-III index scores were high with median scores no lower than .95. Total sample test-retest stability estimates, derived from over a period of one year between testing, had a median score of .88 for Acquired Knowledge, .73 for Thinking Abilities, and .78 for Cognitive Efficiency. The median retest reliability across all reliability coefficients listed was .94.

Procedure

Participants met individually with a research assistant who administered a general information questionnaire, the RIAS, and the WJ-III. The cognitive measures were administered in a random, counterbalanced order during a single test session. The WJ-III was the first test administered to 52 participants. The RIAS was the first test administered to 55 participants. Only graduate-level, school psychology students who had completed coursework on the administration of intelligence tests, including both the RIAS and WJ-III, administered the tests. Written informed consent was obtained from each participant using procedures approved by the university's institutional review board for use with human research subjects. Participants had the option of terminating their participation at any time and were provided with a written summary of their performance upon request. Upon completion of their session, participants were given a receipt documenting their participation, which was used in partial fulfillment of a course requirement to participate as a subject in research.

Data Analyses

Pearson product-moment correlation coefficients were calculated between the RIAS (CIX, NIX, and VIX) and the WJ-III (GIA, Gc, and Gf). Significant non-zero correlations were identified using a two-tailed test, with alpha set at .05. Because a restricted range (see Tables 2-

4) lowers observed Pearson correlation coefficients, corrected coefficients were computed using criteria outlined by Guilford and Fruchter (1978). Corrected correlations were calculated whenever a standard score's distribution (RIAS or WJ-III) had a standard deviation less than the normative value of 15 points.

A series of ANOVA's were conducted to evaluate mean differences in corresponding standard scores on the RIAS and WJ-III. Administration Order (order) was utilized as the between-subjects independent variable, which consisted of two conditions (WJ-III first & RIAS first). Test Battery (test) was the within-subjects dependent variable for each ANOVA. Test consisted of a pair of composite standard scores, one from each test battery, which were judged to have substantial theoretical overlap. This resulted in three separate ANOVAs, which examined differences in the following composite score dyads: a) CIX & GIA, b) VIX & Gc, and c) NIX & Gf,

Results

Tables 2-4 present descriptive statistics for the RIAS and WJ-III composite scores. All mean composite scores fell within the average range of functioning across both tests (97.55 to 107.38). Standard deviations ranged from 9.30 to 10.86 for the RIAS and from 9.33 to 10.03 on the WJ-III.

Table 5 presents observed and corrected Pearson product-moment correlation coefficients between composite standard scores on the RIAS and WJ-III. Correlations between RIAS composite scores and WJ-III composite scores were positive and statistically significant. For the RIAS Composite Intelligence Index (CIX), observed correlations with WJ-III composite scores ranged from .55 to .73; corrected values ranged from .72 to .86. Observed and corrected correlations between the RIAS CIX and the corresponding index of g on the WJ-III (GIA), were

statistically significant and indicated 32 percent and 56 percent of shared variance (r^2 = .32 and .56 respectively). However, the RIAS CIX correlated most strongly with WJ-III Comprehension-Knowledge (Gc). Observed and corrected correlations indicated 53 percent and 76 percent of shared variance respectively (r^2 = .53 and .76)

For the RIAS Verbal Intelligence Index (VIX), observed correlations with WJ-III composite scores ranged from .49 to .72. Corrected values ranged from .64 to .88. Observed and corrected correlations were largest in magnitude and indicated the largest proportion of shared variance between WJ-III Comprehension-Knowledge (Gc) and VIX (r^2 = .52 and .77 respectively).

Observed correlations between the RIAS Nonverbal Intelligence Index (NIX) and WJ-III composite scores ranged from .38 to .40. Corrected values ranged from .54 to .57. Observed and corrected correlations between NIX and WJ-III Fluid Reasoning (Gf) indicated that these variables shared 15 percent and 29 percent of variance respectively (r^2 = .15 and .29).

Results from the three repeated measures ANOVAs revealed that the RIAS produced significantly higher composite standard scores on all three of the examined score dyads. Significant main effects for test were observed for CIX and GIA; $F(1, 105) = 22.93$, $p = .00$, $\eta^2 = .18$; VIX and Gc, $F(1, 105) = 47.10$, $p = .00$, $\eta^2 = .31$; and NIX and Gf, $F(1, 105) = 15.04$, $p = .00$, $\eta^2 = .13$). Significant test by order interactions were not observed in any of the three ANOVAs, suggesting no effects due to the order of test administration.

Discussion

The authors of the Reynolds Intellectual Assessment Scales (RIAS) state that it is an accurate and quick measure of general intelligence g, nonverbal intelligence (fluid ability), and verbal intelligence (crystallized ability) for most children and adults. Previous validity studies

(Reynolds & Kamphaus, 2003; Beujean, et. al, 2006; McChristina, Windsor, & Smith, 2007; Edwards & Paulin, 2007) consistently indicate moderate to high RIAS correlations across full-scale scores and across verbal composites. Correlations of the RIAS nonverbal scale with the Wechsler nonverbal scales were consistently lower (see Table 1). No prior studies with established fluid ability measures were available. The findings in this study with university students were consistent with the prior research on the CIX and VIX scales. The scores on the NIX scale were substantially lower.

The data in this study do not appear to support the use of the NIX scores as interpretable under the Gf-Gc or CHC frameworks. Further study is needed to determine whether this outcome is a result of the design of the NIX scale, a limitation of the WJ-III fluid ability measure, or an artifact of this sample.

Practically speaking, given current and previous research, if the practitioner needs information beyond general intellectual ability and crystallized intelligence, a different measure may be warranted. These data do not appear to support the RIAS as a processing measure. This is important as processing data may be needed in the diagnosis of a learning disorder according to both the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 1994) and the Individuals with Disabilities Education Improvement Act (IDEIA) 20 U.S.C § 1400 (2004). It should be noted, however, that there do not appear to be published studies indicating that longer measures provide sufficient information for this diagnosis, either.

To be clear, the authors of the RIAS do not visualize it to be a stand-alone instrument that measures constructs more narrow than g, fluid, and crystallized intelligence. They specifically write that when “obtaining useful clinical information about specific abilities or information

processing skills, tests designed for these specific purposes should be used." (Reynolds & Kamphaus, 2003, p.6). They added that the "assessment of specific abilities should be left to other measures without high levels of saturation by g (Reynolds & Kamphaus, 2003, p. 11).

Although the authors of the RIAS advocate gathering additional processing data from other tests (Reynolds & Kamphaus, 2003), other researchers feel that gathering data from multiple measures with different production dates and normative groups becomes problematic when trying to determine within-person processing strengths and weaknesses (Salvia & Ysseldyke, 1988). Even considering this, the limitations of not being able to provide comprehensive processing information may limit the use of the RIAS as a measure of a learning disorder. The RIAS appears to provide an excellent measure of g for use with other disorders that require only general measures of intelligence such as Mental Retardation, Attention Deficit Hyperactivity Disorder, Anxiety, and/or Mood Disorders.

An additional finding in the current study is that the composite scores from the RIAS were significantly higher than those from the WJ-III. Higher scores on the RIAS have been reported in other studies as well. McChristian, Windsor, & Smith (2007) obtained full scale scores (CIX) that fell 7.02 standard score points above the WISC-III, full scale score (FSIQ). Edwards & Paulin (2007) found that the CIX score fell 3.6 standard score points above the full-scale score (GAI) on their WISC-IV to RIAS comparison. Only the WISC-III and WAIS-III validity studies mentioned in the manual found full-scale mean scores higher on other tests than those found on the RIAS by 7.57 and 0.52 standard score points respectively (Reynolds & Kamphaus, 2003). Further investigation is warranted.

There are some limitations with the current study. First, given the sample, the findings can only apply to university students. In addition, although the sample was larger than those used

in all of the other RIAS convergent validity studies, it was still smaller than might be desired. For example, a larger sample would have enabled a conjoint confirmatory factor analysis with the various WJ-III and RIAS subscales identified as measures of fluid ability. Another limitation is that this study only compared the RIAS to one other intelligence measure. It would be helpful in future research for additional comparisons to be made with achievement tests as well. Finally, although the current study supports previous data finding lower correlations with the nonverbal index on the RIAS when compared to other nonverbal measures, the data collected cannot explain why this is happening. Further examination of this phenomenon is warranted in future research studies.

References

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th edition). Washington, DC: Author.

Beaujean, A.A., Firmin, M. W., Knoop, A.J., Michonski, J.D., Berry, T.P., & Lowrie, R.E. (2006). Validation of the Frey and Detterman (2004) IQ prediction equations using the Reynolds Intellectual Assessment Scales. Personality and Individual Differences, 41. 353-357.

Biederman, J, Faraone, S.V., Spencer, T., Wilens, T., Norman, D., Lapey, K.A., Mick, E., Lehman, B.K., & Doyle, A. (1993). Patterns of psychiatric comorbidity, cognition, and psychosocial functioning in adults with attention deficit hyperactivity disorder. American Journal of Psychiatry, 150, 1792-1798.

Bracken, B.A. & Schraw, G. (2005). Review of the Reynolds Intellectual Assessment Scales and the Reynolds Intellectual Screening Tests (RIAS/ RIST). In Mental Measure Yearbook, 16. Lincoln, NE: University of Nebraska Buros Institute of Mental Measurements.

Carroll, J.B. (1993). Human cognitive abilities: A survey of factor analytic studies. New York: Cambridge University Press.

Carson, A. d. (1996). Aptitudes across Holland's types: Implications for school-based counseling. McGill Journal of Education, 31, 319-331.

Cattell, R.B. (1963). Theory of fluid and crystallized intelligence: A critical experiment. Journal of Educational Psychology, 54(1), 1-22

Edwards, O.W., & Paulin, R.V. (2007). Referred students' performance on the Reynolds Intellectual Assessment Scales and the Wechsler Intelligence Scale for Children-Fourth Edition. Journal of Psychoeducational Assessment, 25 (4), 334-340.

Flanagan, D.P., & Harrison, P.L. (Eds.). (2005). Contemporary intellectual assessment, second edition: Theories, tests, and issues. New York: The Guilford Press.

Guilford, J. P., & Fruchter, B. (1978). Fundamental Statistics in Psychology and Education (sixth edition). New York: McGraw-Hill Book Company.

Horn, J.L. (1968). Organization of abilities and the development of intelligence. Psychological Review, 75(3), 242-259.

Horn, J.L. (1985). Remodeling old models of intelligence, In B.B. Wolman (Ed.), Handbook of intelligence (pp. 267-300). New York: Academic Press.

Horn J.L., & Cattell, R.B. (1966). Refinement and test of the theory of fluid and crystallized general intelligences. Journal of Educational Psychology, 57(5), 253-270.

Individuals with Disabilities Education Act, 20 U.S.C § 1400 (2004).

Kamphaus, R. W. (1993). *Clinical assessment of children's i*ntelligence. Boston: Alyyn & Bacon.

Kaufman, A. S., & Kaufman, N. L. (2004). Kaufman Assessment Battery for Children, Second Edition. Circle Pines, MN: American Guidance Service.

Kaufman, A.S., Lictenberger, E.O., & Naglieri, J.A. (1999) Intelligence testing in schools. In C.R. Reynolds & T.B. Gutkin (Eds.), The handbook of school psychology, third edition. (pp. 307-349). New York: John Wiley & Sons, Inc.

McChristian, C. L., Windsor, E. P., & Smith, B. L. (2007, March). Reevaluation considerations: The relationship of the RIAS to the WISC-III. Presentation at National Association of School Psychologists (NASP) New York.

McGrew, K.S., & Woodcock, R.W. (2001). Technical Manual. Woodcock-Johnson-III. Itasca, IL: Riverside Publishing.

Morgan, A.M., Sullivan, S.A., Darden, C., & Gregg, N. (1997). Measuring the intelligence of college students with learning disabilities: A comparison of results obtained on the WAIS-R and the KAIT. Journal of Learning Disabilities, 30, 560-565.

Ofiesh, N.S., & McAfee, J.K. (2000). Evaluation practices for college students with LD. Journal of Learning Disabilities, 33 (1), 14-25.

Reynolds, C. R., & Kamphaus, R. W. (2003). Reynolds Intellectual Assessment Scales (RIAS) and the Reynolds Intellectual Screen Test (RIST) professional manual. Lutz, Florida: Psychological Assessment Resources, Inc.

Roid, G. H. (2003). Stanford-Binet Intelligence Scales, Fifth Edition, Technical manual. Itasca, IL: Riverside Publishing.

Salvia, J., & Ysseldyke, J.E. (1988). Assessment in special and remedial education, 4th ed. Boston: Houghton Mifflin.

Schrank, F.A., Flanagan, D.P., Woodcock, R.W., & Mascolo, J.T. (2002). Essentials of WJ-III Cognitive Abilities Assessment, New York: John Wiley & Sons.

Taub, G.E., & McGrew, K.S. (2004). A confirmatory factor analysis of Cattell-Horn-Carroll theory and cross age invariance of the Woodcock-Johnson Tests of Cognitive Abilities III. School Psychology Quarterly, 19 (1), 72-87.

Wechsler, D. (2003). Wechsler Intelligence Scale for Children (4th ed.). San Antonio, TX: The Psychological Corporation.

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). Woodcock-Johnson III Tests of Cognitive Abilities. Itasca, IL: Riverside.

Table 1

Obtained Pearson Product Moment Correlations Between RIAS Other Measures of Intelligence

Previous Studies	CIX	VIX	NIX
WAIS-III (Reynolds & Kamphaus, 2003)			
FSIQ	.75		
VIQ		.71	
PIQ			.71
WISC-III (Reynolds & Kamphaus, 2003)			
FSIQ	.76		
VIQ		.86	
PIQ			.33
WISC-III (McChristian, Windsor, & Smith, 2007)			
FSIQ	.67		
VIQ		.73	
PIQ			.44
WISC-IV (Edwards & Paulin, 2007)			
FSIQ	.90		
VIQ		.90	
PIQ			.72

Note. FSIQ = Full Scale IQ, VIQ = Verbal IQ, PIQ = Performance IQ; CIX = Composite Intelligence Index, VIX = Verbal Intelligence Index, and NIX = Nonverbal Intelligence Index.

Table 2

Descriptive Statistics for RIAS and WJ-III Composite Scores: Total of All Administrations

	Total (N = 107)				
	M	SD	Range	Skewness	Kurtosis
RIAS					
CIX	104.63	9.30	81-131	.085	-.130
VIX	102.56	10.86	74-128	-.196	-.089
NIX	107.38	10.14	82-134	.132	-.212
WJ-III					
GIA	100.72	9.33	77-121	.146	-.552
Gc	97.55	9.41	75-121	.265	-.221
Gf	103.08	10.03	73-125	-.074	-.061

Note. GIA = General Intellectual Ability, Gc = Comprehension-Knowledge, Gf = Fluid Reasoning; CIX = Composite Intelligence Index, VIX = Verbal Intelligence Index, and NIX = Nonverbal Intelligence Index.

Table 3

Descriptive Statistics for RIAS and WJ-III Composite Scores: WJ-III Administered First

	WJ-III First (n = 50)				
	M	SD	Range	Skewness	Kurtosis
RIAS					
CIX	104.70	8.87	86-131	.295	.242
VIX	102.94	10.613	76-128	-.347	.264
NIX	107.04	9.441	88-128	.148	-.706
WJ-III					
GIA	99.56	9.15	77-121	.555	.178
Gc	96.70	9.76	75-117	-.009	-.509
Gf	102.98	10.07	73-125	-.103	.432

Note. GIA = General Intellectual Ability, Gc = Comprehension-Knowledge, Gf = Fluid Reasoning; CIX = Composite Intelligence Index, VIX = Verbal Intelligence Index, and NIX = Nonverbal Intelligence Index.

Table 4

Descriptive Statistics for RIAS and WJ-III Composite Scores: RIAS Administered First

	RIAS First (n = 57)				
	M	SD	Range	Skewness	Kurtosis
RIAS					
CIX	104.56	9.736	86-131	-.049	-.318
VIX	102.23	11.158	76-128	-.079	-.231
NIX	107.68	10.786	88-128	.103	.030
WJ-III					
GIA	101.74	9.44	77-121	-.189	-.765
Gc	98.30	9.12	75-117	.607	-.045
Gf	103.16	10.90	73-125	-.051	-.370

Note. GIA = General Intellectual Ability, Gc = Comprehension-Knowledge, Gf = Fluid Reasoning; CIX = Composite Intelligence Index, VIX = Verbal Intelligence Index, and NIX = Nonverbal Intelligence Index.

Table 5

Obtained (O) and Corrected (C) Pearson Product Moment Correlations Between RIAS and WJ-III Test Composite Scores

	RIAS: CIX		RIAS: VIX		RIAS: NIX	
WJ-III Composite	O	C	O	C	O	C
GIA	.57*	.75	.52*	.70	.38*	.55
Gc	.73*	.86	.72*	.88	.40*	.57
Gf	.55*	.72	.49*	.64	.39*	.54

Note. *p < .01.