

The Cognitive Assessment Course: Two Decades Later

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We wish to thank all of the faculty who completed this survey and who work tirelessly to provide students with evidence-based training in cognitive assessment. We thank Randy Floyd who reviewed an early draft of this manuscript and Vincent Alfonso for providing the original survey.

### Abstract

Given significant changes to legislation, practice, research, and instrumentation, the purpose of this study was to examine the course on cognitive assessment in school psychology programs and to describe the (a) structure, (b) instructional strategies, (c) content, and (d) interpretative strategies taught to school psychology graduate students. 127 instructors were surveyed, and results suggest that over the last 20 years support for teaching cognitive assessment has decreased while the content and instructional strategies have remained largely the same. Results of this study also indicate that the interpretation strategies taught rely heavily on Cattell-Horn-Carroll theory and related interpretive frameworks (e.g., cross-battery assessment). Additionally, instructors are placing greater emphasis on and multicultural sensitivity/ culturally and linguistically diverse assessment than in previous decades. Implications for future research, training and practice are discussed.

*Keywords:* intelligence test; cognitive assessment; training; school psychology; interpretation

### The Cognitive Assessment Course: Two Decades Later

Assessment has long been a significant part of school psychologists' role with survey data from 2015 (Walcott, Charvat, McNamara, & Hyson, 2016), 2010 (Castillo, Curtis, & Gelley, 2012), and well before (Goh, Teslow, & Fuller, 1981; Hutton, Dubes, & Muir, 1992; Stinnett, Harvey, & Oehler-Stinnett, 1994) indicating that practitioners spend about half of their professional time engaged in eligibility determination and, specifically, individual assessment. Cognitive testing has been a mainstay of school psychological practice (Benson et al., 2019; Goh, Teslow, & Fuller, 1981; Hutton, Dubes, & Muir, 1992; Stinnett, Harvey, & Oehler-Stinnett, 1994), with federal legislation (e.g., Education of All Handicapped Children Act, 1975; Individuals with Disabilities Education Act [IDEA], 2004) mandating their use and affirming school psychologists' role as gatekeepers to special education (Farrell, 2010).

#### **The Role of Cognitive Testing**

Research conducted in the 1980s (e.g., Goh, Teslow, & Fuller, 1981; Reschly, Genshaft, & Binder 1987) indicated that measures of cognitive ability topped the list of the most commonly used components of psychoeducational evaluation, a trend that continued into the 1990s. Of the three published studies on this topic during the 1990s, Hutton, Dubes, and Muir (1992) indicated that cognitive assessment was the most utilized assessment procedure with the other two studies indicating that cognitive assessments were the second most utilized procedures, surpassed only by unstructured interviews in one study (i.e., Stinnett, Harvey, & Oehler-Stinnett, 1994) and structured observations in another (i.e., Wilson & Reschly, 1996). Since these studies were conducted, IDEA (2004) has made significant changes to special education criteria, especially specific learning disability (SLD). As a result of these changes a significant shift in the

use of cognitive testing to identify SLD has occurred, impacting both practice (Unruh & McKeller, 2013) and state guidelines (Maki, Floyd, & Roberson, 2015). While use of cognitive testing models for SLD has decreased in favor of approaches that utilize response to intervention (RTI) (e.g., Unruh & McKeller, 2013), Maki and colleagues (2015) found that, at the time of their study, 67% of states permitted school psychologists to use an ability-achievement discrepancy and 25% of states permitted the use of a patterns of strengths and weaknesses (PSW) model.

Despite these changes to practice and legal guidelines, cognitive tests continue to be a key component of assessments conducted by school psychologists. For example, Benson and colleagues (2019) conducted a national survey of 1,317 school psychologists and found that more than 95% of respondents administered a cognitive test during the last year, with the Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V; Wechsler, 2014) alone used an average of almost 3 1/2 times per month per respondent. Furthermore, another national survey of 323 school psychologists conducted by Sotelo-Dynega and Dixon (2014) found that 99% of participants administered cognitive tests; of those participants, between 30% and 39% of their time was spent administering and scoring cognitive tests. In light of these findings, the continued inclusion of cognitive tests in decisions about SLD (Maki et al., 2015), and traditional uses of cognitive tests in the identification of intellectual disability and giftedness (McClain & Pfeiffer, 2012; McNicholas et al., 2018), and their use with various other referral concerns (Sotelo-Dynega & Dixon, 2014), it is unsurprising that cognitive test use remains constant in school psychology.

### **Empirical and Theoretical Advances**

In addition to changes in practice and legislation, research on the ontological (e.g., Jauk, Benedek, Dunst, & Neubauer, 2013; Zaboski, Kranzler, & Gage, 2018) and epistemological (e.g., van der Maas et al., 2006) nature of intelligence continues. Other researchers have focused on specific practices related to cognitive assessment (e.g., McGill, 2016; Miciak et al., 2017). Outside of cognitive assessment research, an increase in focus on the use of empirically supported instruments and procedures during psychological assessment practices (e.g., Hunsley & Mash, 2007; 2019; Youngstrom et al., 2017) has developed from the evidence-based medicine movement, and in parallel to calls for evidence-based practice. Perhaps the most salient change for the training and practice of cognitive assessment in the past two decades has been the merger of two dominant theories of cognitive ability (i.e., Extended Gf-Gc theory (Horn & Blankson, 2012) and Three Stratum Theory (Carroll, 1996), into the Cattell-Horn-Carroll (CHC) theory of intelligence<sup>1</sup> (Schneider & McGrew, 2018)). Subsequently, many popular cognitive tests have adopted this theoretical framework (see Flanagan & McDonough, 2018). Related, contemporary CHC-based interpretive approaches, such as cross-battery assessment (XBA; Flanagan et al., 2018), have been developed and popularized. The past 20 years have also seen a rise in neuropsychological approaches to test interpretation in school psychology (e.g., Kaufman, Raiford, & Coalson, 2016). For instance, Naglieri's Planning, Attention, Simultaneous, and Successive (PASS) Theory of Neurocognitive Processes (see Naglieri & Otero, 2018) has been developed along with the Cognitive Assessment System, now in its second edition (CAS-2; Naglieri, Das, & Goldstein, 2014). Likewise, the number of scores that can be produced by cognitive assessment instruments have drastically increased (Frazier & Youngstrom, 2007), as

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<sup>1</sup> We recognize that there is dispute about whether CHC constitutes a taxonomy of cognitive abilities or is a theory of intelligence (see Canivez & Youngstrom, 2019); however, the purpose of this manuscript is not to evaluate theory, and so we will use the terminology consistent with Schneider and McGrew (2018).

have the number of commercially available brief (e.g., RIAS-2; Reynolds & Kamphaus, 2015), abbreviated (e.g., WISC-V General Ability Index; Wechsler, 2014), and multidimensional nonverbal assessments (e.g., Universal Nonverbal Intelligence Test, Second Edition [UNIT2]; Bracken & McCallum, 2016). While some of these changes (e.g., increase in scores produced per cognitive assessment) may be tied to contemporary interpretive frameworks (e.g., neuropsychological), others (i.e., the increase in nonverbal tests) are likely a function of the United States becoming more culturally and linguistically diverse. It can be assumed, given the substantial changes to the landscape of cognitive assessment, supporting theory, and knowledge about practice that training would also have experienced significant changes.

## **Training**

According to the American Psychological Association's *Standards for Accreditation for Health Service Psychology* (2015) and NASP's (2010b) *Standards for Graduate Preparation of School Psychologists*, school psychology programs should prepare trainees who have knowledge of, and are able to demonstrate skills in, psychological and educational assessment. School psychology training programs have emphasized assessment over the past four decades (Alfonso et al., 2000; Meacham & Peckham, 1978; Oakland & Zimmerman, 1986; Wilson & Reschly, 1996), and the initial course on cognitive assessment is of great importance in developing a student's diagnostic skills as it is often the first clinical course taught to trainees (Oakland & Zimmerman, 1986) and often sets the tone for future practice (Wilson & Reschly, 1996). This sequence has a long-lasting impact, with professionals' practice remaining generally consistent with their training (Alfonso, et al., 2000; Sotelo-Dynega & Dixon, 2014; Wilson & Reschly, 1996). Sotelo-Dynega and Dixon (2014) reported that nearly 70% of their participants continue to follow interpretive approaches learned during their course on cognitive testing. The

administration and interpretation of cognitive assessment is not trivial to the role of school psychologists, nor is it without diversity of approaches (e.g., Benson et al., 2019; Canivez, 2013; Sattler, 2018) or controversy (see McGill, Dombrowski, & Canivez, 2018). Thus, it is crucial to examine the content, requirements, and testing practices taught in school psychology graduate training programs.

Oakland and Zimmerman (1986) published the first description of the content, requirements, and testing practices taught in school psychology graduate program courses on cognitive ability (which was the authors termed “individual mental assessment,” p. 51). The authors collected data in 1983 from 49 instructors across the United States across three domains: (a) university and program information, (b) descriptive information about the course on cognitive assessment, and (c) demographic information about the instructor and teaching assistant(s). In 1983, 100% of instructors who responded held a doctoral degree, while just under half had both experience in school and clinical settings (44%). Instructors spent around 14 hours per week on the cognitive assessment course, and most (70%) reported having an assigned teaching assistant (TA). TAs typically had taken an advanced course in assessment, had experience administering cognitive assessments, and held a masters or specialist degree. The majority of students enrolled in the cognitive assessment course were masters or specialist (50%) and doctoral (23%) school psychology students, followed by masters clinical (10%) and counseling psychology (7%) students. Furthermore, Oakland and Zimmerman found that many graduate programs required students to take the course in their first year on campus (41%), with the majority of courses completed in a single semester (65%). The course was most often offered once (58%) per year, typically for three (55%) or four (25%) credit hours.

More than 90% of respondents reported that test administration, interpretation, scoring, and reporting were a “very important” topic of the class (Oakland & Zimmerman, 1986). The most emphasized measures were the Wechsler Intelligence Scale for Children—Revised (WISC-R) (used by 94% of respondents), followed by the Wechsler Adult Intelligence Scale-Revised (WAIS-R), the Stanford-Binet (Roid, 2003), and the Wechsler Preschool and Primary Scale of Intelligence. Additionally, students were required to complete an average of 7.3 protocols, 6.7 practice tests, and 2.5 observations (Oakland & Zimmerman, 1986). The authors further suggested that this class should be offered as a 4-credit instead of a 3-credit course due to the costs incurred by both students and instructors in terms of time, money and other resources.

A decade later, between fall of 1995 and winter of 1996, Alfonso and colleagues (2000) surveyed 97 instructors of cognitive assessment using a revised version of Oakland and Zimmerman’s (1986) questionnaire. Results indicated that the initial course on cognitive assessment continued to be a major focus of training programs; instructors continued to devote an inordinate amount of time teaching this course spending, on average, greater than 16 hours a week on tasks related to this class. Most instructors indicated that they were full-time faculty (77%), held a doctoral degree (98%), and had an assigned TA (76%). Roughly half (53%) of instructors reported having clinical experience. Classes were largely composed of school psychology non-doctoral students (54%) and doctoral students (18%) and averaged 13 students in size. Like Oakland and Zimmerman (1986), they found that test administration, scoring, and report writing were greatly emphasized. About half of participants indicated that they greatly emphasized test interpretation based on theory (52%), while only a few reported greatly emphasizing culturally and linguistically diverse students (15%). Ninety two percent of respondents required at least one scored protocol of one or more tests from the Wechsler series,



and 74% of respondents required one or more scored protocol for the Stanford-Binet. Instructors that utilized the WISC required five to six scored protocols, and those that used the Stanford-Binet required three to four. At least 50% of participants indicated that (a) test psychometric properties, (b) frequency of use, (c) expectations for field placements, (d) the instrument's underlying theory of intelligence, (e) how widely a measure is used, (f) and the test's supporting validity evidence across populations were all heavily considered. Oakland and Wechsler (2016) offered guidelines for international trainers developing an "entry-level" course on cognitive assessment. Emphasis within their guidelines focused on the types of content to include within the course (e.g., foundational knowledge), advice regarding the selection of test kits, and recommendations for resources (e.g., textbooks). These guidelines were heavily based on the surveys completed by Oakland and Zimmerman (1986) and Alfonso and colleagues (2000).

### **Purpose of the Study**

Since Oakland and Zimmerman (1986) and Alfonso and colleagues (2000) completed their surveys of coursework on cognitive testing, the professional landscape has experienced drastic legislative changes (i.e., IDEA, 2004), extensive updates and challenges to cognitive theory (see Canivez & Youngstrom, in press; Schneider & McGrew, 2018), a surge in interpretation models (e.g., Fiorello & Wycoff, 2018; Flanagan et al., 2018; Miller, 2013), a number of empirical investigations related to theory and practice with cognitive tests (e.g., Zaboski, Kranzler, & Gage, 2018), and a push for evidence-based assessment strategies (e.g., Hunsley & Mash, 2007; Youngstrom et al., 2017) within school psychology (see McGill, 2019). Cognitive testing maintains an important role in the functioning and professional identity of school psychologists (Benson et al., 2019; Sotelo-Dynega & Dixon, 2014; Walcott et al., 2016) and school psychology training programs have a responsibility to prepare students to use

cognitive tests for the purpose of data-based decision making (APA, 2015; NASP, 2010a). The purpose of this paper is to replicate and extend the work of Oakland and Zimmerman (1986) and Alfonso and colleagues (2000) as no research on the initial course on cognitive assessment has been published since these seminal studies. Specifically, Alfonso et al. argued that school psychology programs were not adequately responsive to changes in special education law and research during the previous decade and encouraged modification of coursework on cognitive assessment. We will provide a snapshot of current structural practices (e.g., TA support), content covered within the course on cognitive assessment, and instructional strategies used by instructors. Furthermore, as recommended by Alfonso and colleagues, we will describe the theoretical approaches and interpretation behaviors taught and emphasized by current instructors of cognitive assessment courses. Given the potential impact of competing interpretations of intelligence tests on client outcomes (see Messick, 1995), it is critical that we understand and evaluate how school psychology practitioners are trained to interpret intelligence test results.

### **Method**

Institutional Review Board approval was obtained. All participation was voluntary, and all participants were provided with an electronic informed consent document. The Checklist for Reporting Results of Internet ESurveys (Eysenbach, 2004) was used to guide reporting of survey methods and results.

### **Participants**

Participants were 127 faculty affiliated with programs in the United States offering a graduate degree in school psychology. Participant and program demographic information are available in Tables 1 and 2, respectively. Ninety-three percent of the participants held a doctoral degree (i.e., Ph.D., Psy.D., or Ed.D.) as their highest degree, 41% were licensed psychologists,

28% held state certification as a school psychologist only, and 63% had past experience in either a school or clinical setting. Fifty-one percent of the participants reported being a Nationally Certified School Psychologist. Only 61% reported holding a full-time faculty position. The majority, 80%, of participants reported teaching in a NASP approved program; of those participants teaching in doctoral programs, roughly 80% reported that their program was APA accredited. Demographic data of this type for faculty in school psychologist training programs are not readily available for comparison.

**Recruitment of participants.** Two recruitment strategies were used to obtain a representative sample of trainers teaching cognitive assessment courses. Both methods featured a recruitment letter and an anonymous link to an online survey. First, the survey was emailed to directors of the 239-school psychology graduate training programs listed on the NASP website (<http://www.nasponline.org/standards-and-certification/graduate-program-approval-and-accreditation/nasp-approved-programs>) during fall 2018 and winter of 2018-2019. Directors were asked to share the survey link with the faculty member responsible for teaching the first course on cognitive assessment. From those programs recruited, 98 faculty (41%) participated in the study. As responses were anonymous, all directors were sent two email reminders asking them to forward the survey to the appropriate faculty member. Second, we requested approval to post a national call for participants on the Trainers of School Psychology (TSP) listserv. In total, we sent out two TSP listserv posts requesting participants, resulting in an additional 36 responses. We cannot calculate a response rate from the TSP listserv nor assume that only programs listed on the NASP website received the call for participants.

### **Survey Design**

The survey instrument was designed to collect data about participant and program demographics as well as information about (a) course structure and support (e.g., TA support and qualifications, frequency of course offering, student enrollment); (b) assignments and grade structure; (c) test administration requirements (e.g., test selection and administration); (d) report writing requirements; (e) test theories and interpretation strategies; and (g) course content (e.g., emphasized topics). Items were initially generated with permission (V. Alfonso, personal communication, September 4, 2018) from past survey research (Alfonso et al., 2000), then updated based on recent review articles (e.g., Oakland & Wechsler, 2016), related research (e.g., Benson et al., 2019; Sotelo-Dynega & Dixon, 2014), and recent textbooks (e.g., Dombrowski, 2014; Hunsley & Mash, 2018; Kranzler & Floyd, 2013). Novel items related to theory and interpretation strategies were developed based on a review of related articles (e.g., McGill et al., 2018; Sotelo-Dynega & Dixon, 2014), textbook chapters from key authors (e.g., Canivez, 2013; Fiorello & Wycoff, 2018; Flanagan & McDonough, 2018; Flanagan et al., 2018; Sattler, 2018), and textbooks on interpretation procedures (e.g., Kaufman, Raiford, & Coalson, 2016). The survey was then reviewed by five content experts (i.e., five faculty members from four separate school psychology programs with experience teaching cognitive assessment) who provided feedback; items were added, revised, and deleted based on feedback.

### **Survey Administration**

The survey was hosted on the Qualtrics platform. The survey was completed online and no limitations were placed on how participants accessed the survey (i.e., they could gain access via computer, tablet, or smartphone). An item asking participants if their program offered a graduate degree in school psychology functioned to exclude persons who did not meet the criteria (i.e., faculty teaching in a school psychology graduate program). Unique IP addresses

were required to minimize the risk of a single person completing the survey multiple times. The survey consisted of 48 questions, of which 36 were multiple-choice items, eight were matrix tables, two were constant sum (i.e., values were summed across responses), one was a slider, and one was pick-group-and-rank (i.e., a Q sort type task where participants have the option to select from a list, rank selected items, and exclude items). Participants had the option to enter additional details when “other” was selected as part of a multiple-choice or matrix table item. Qualtrics’ skip-logic function was used to minimize participant response time such that participants who did not receive TA support, require certain types of assignments (e.g., report writing), and specific scoring procedures (e.g., using scoring software) were not presented with inapplicable items. The survey remained open from November 5, 2018 (the first e-mail to program directors) to January 15, 2019 for the e-mail surveys and from December 4, 2018 (the first call for participants) to January 15, 2019 for the listserv; a follow up e-mail to directors was sent on November 27, 2018 and to the listserv on December 11, 2018. A PDF version of the Qualtrics survey is available via Open Science Framework, <https://OSF.IO/69W58>.<sup>2</sup>

### **Data Analysis**

Both the e-mail and listserv datasets were downloaded from Qualtrics on January 16, 2019; the data were coded by source for comparison at this stage and merged. The downloaded responses consisted of 149 records; of those, 13 contained no data (e.g., survey testing) and one record indicated that the participant did not consent, resulting in 134 participants. Of those, seven participants reported that their programs did not offer a graduate degree in school psychology and were excluded, resulting in 127 participants from both sources. To ensure that the two

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<sup>2</sup> Permission to share adopted portions of the survey was granted by V. Alfonso (personal communication, April 4, 2019).

samples were not drawing from different populations, participants from the two samples were compared across key professional and programmatic variables (i.e., degrees earned, full-time status, degrees offered by program, NASP approval status, and APA accreditation status) and no significant differences were found between samples. One-hundred and eighteen records were fully complete while nine records had varying levels of completeness; the missing data pattern was found to be arbitrary as there was no clear pattern of missing responses (Little, Jorgensen, Lang, & Moore, 2014; Schafer & Graham, 2002). Between 0 and 4 (3% or less) records contained missing data per variable, and thus it is believed that these missing data had negligible impact upon our analyses.

## **Results**

### **Administrative Structure and Student Enrollment**

The majority of participants (74%) report having at least one teaching assistant (TA) assigned to the course. Faculty report that TAs contribute an average of 8.66 ( $SD = 5$ ;  $mdn = 5$ ) hours per week, with 90% reporting TAs contribute 20 or fewer hours per week. Of these TAs, most (80%) are graduate students; it is unclear from our data what group makes up the remaining 20% of TAs. While only 21% of TAs hold a master's degree and 35% hold an educational specialist degree, 48% had previous experience completing cognitive assessment outside of specific coursework. Approximately one-third (35%) had completed a course on cognitive assessment only, and a quarter completed an advanced assessment course.

Roughly half of faculty report that the course is completed during one semester (49%) while some programs offer two courses (32%). Fewer programs offer three or more (9%) courses on cognitive assessment. Even fewer (2%) offer cognitive assessment as a quarter- or half-term course. Most commonly (40%), three credit hours are awarded for this course; however, some

programs offer a four (17%), five (2%), six (25%), or seven or more credit hour (16%) version of the course. Overall, faculty estimate that students spend an average of 7.98 ( $SD = 5.87$ ;  $mdn = 6$ ) hours per week outside of class.

Typically, between 11 and 13 students (mean = 12.11;  $SD = 7.41$ ;  $mdn = 11$ ) enroll in the course each time it is offered. The amount of time between completion of the course and the practical application of course content (e.g., fieldwork) is generally one (60%) or two (19%) semesters; 13% maintain a concurrent practicum experience. Participants indicated that cognitive assessment courses are largely comprised of students in school psychology programs (96%), though students from clinical psychology (13%), counseling psychology (7%), educational psychology (5%), special education (2%), and “other” (11%) programs enroll as well. Students generally meet several prerequisites before taking this course, including a course on test and measurements (49%; i.e., psychometrics) or introductory statistics (35%). Some programs require instructor permission (21%) though most students (63%) must be formally enrolled in the graduate program before taking the course.

### **Course Content and Topics**

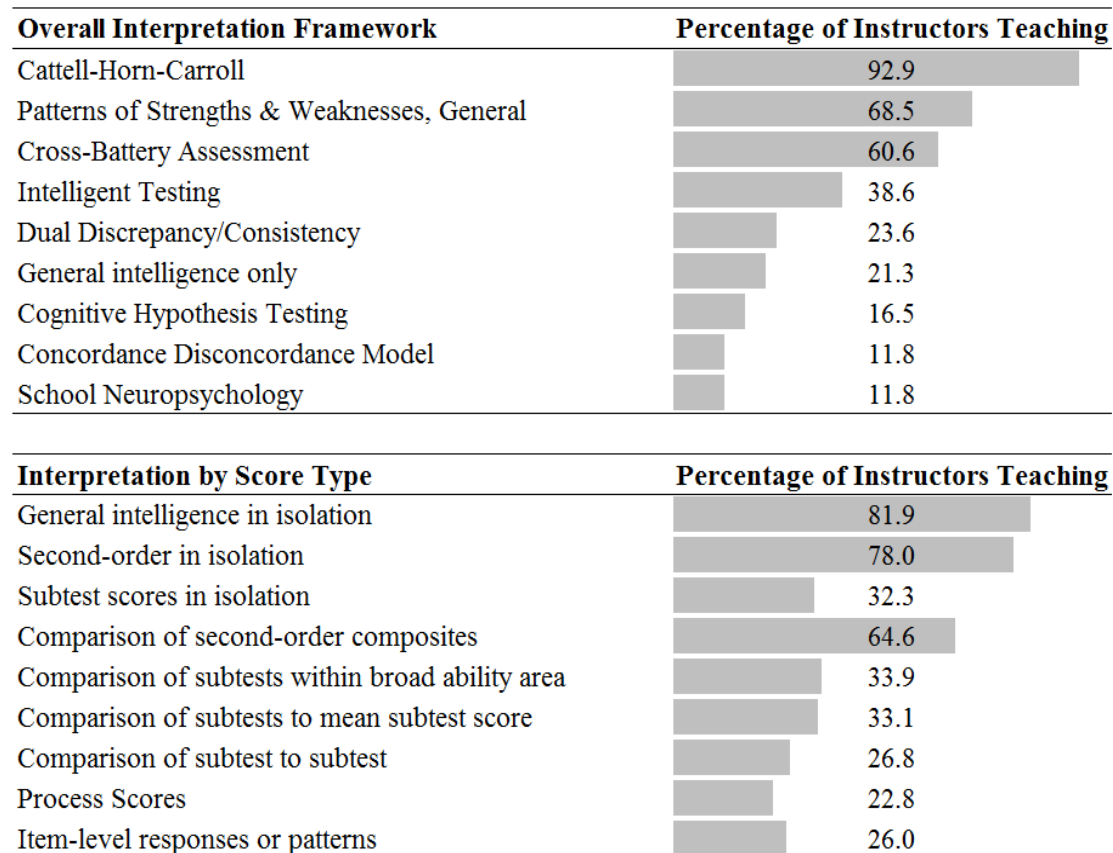
Perhaps as expected, instructors report the majority of course lectures and lab activities are devoted to the topic of cognitive assessment, with an average of 80% ( $SD = 18.68\%$ ;  $mdn = 85\%$ ; range = 30 to 100%) of course time devoted to the topic as opposed to achievement testing or curriculum-based measures. However, the course on cognitive assessment is often not limited purely to coverage of testing, interpretation, and report writing. Data regarding course content and emphasis are presented in Table 3. Several topics receive substantial emphasis (defined as 50% or more of participants reporting “great emphasis”), including child and adolescent development, assessing culturally and/or linguistically diverse (CLD) students, multicultural

sensitivity, and the interpretation of tests from empirically supported frameworks. On the other hand, topics such as assessing students suspected of emotional/behavioral disorder (EBD) and giftedness or studying infant and adult development are rarely emphasized (defined as 50% or more of participants reporting “limited emphasis” or “not covered”).

### **Interpreting Cognitive Tests**

As evident in the top panel of Figure 1, roughly 93% of instructors are teaching CHC theory (see McGrew & Schneider, 2018). Additionally, CHC-related interpretive frameworks are taught by a significant portion of instructors, with 69% teaching students to use a general PSW interpretive framework and 61% providing instruction on XBA, specifically. Fewer participants reported teaching students to use other interpretive frameworks, with approximately 39% teaching Kaufman’s Intelligence Testing framework, 24% teaching Dual Discrepancy/Consistency, 21% teaching emphasis of general cognitive only, 17% teaching Cognitive Hypothesis Testing, and 12% each teaching the Concordance-Discordance Model and a neuropsychological framework. In addition to data on general interpretive frameworks, participants reported and ranked the scores they teach their students to emphasize during the assessment course.



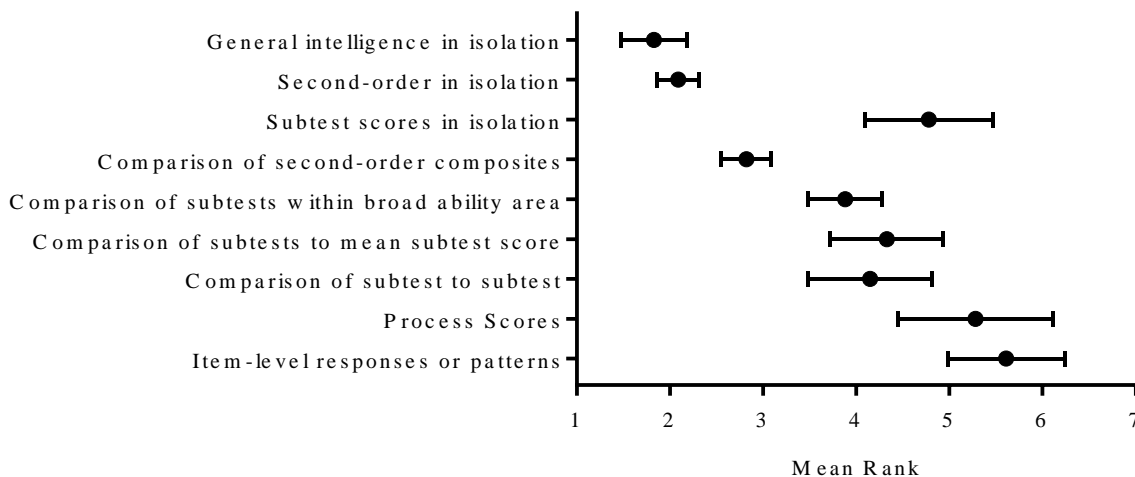


*Figure 1.* Percentage of instructors teaching interpretive framework in the top panel and percentage of instructors teaching interpretation by score type in the bottom panel.

In the bottom panel of Figure 1, the majority of instructors encourage students to focus on composites and composite comparisons, with 82% of instructors teaching students to interpret general intelligence composites, 78% of instructors teaching students to teach second-order composites, and 65% of instructors teaching students to interpret comparisons between second-order composites (e.g., WISC-V Verbal Comprehension Index minus Fluid Reasoning Index). Roughly a third of instructors or fewer teach students to interpret subtest scores (32%), subtest scores compared to other subtests within a composite (34%; e.g., WISC-V Matrix Reasoning to Figure Weights), subtests compared to the average of all subtest scores (33%), and subtest score to subtest score comparisons (27%; e.g., WISC-V Block Design minus Similarities). A quarter of

instructors teach students to interpret item-level responses and patterns (26%) or process scores (23%).

In addition to specifying which score interpretations are taught, instructors were asked to rank scores they teach their students to emphasize during interpretation. Instructors consistently ranked interpretation of general intelligence in isolation first (71%) and second-order composites second (66%), with some overlap indicating that some instructors (16%) teach students to interpret second-order composites primarily. When interpreted, second-order composite comparisons with other second-order composites were ranked third (33%). The mean rank and 95% confidence interval of each score interpretation, calculated based on standard deviation and number of participants reporting use of that score, has been plotted in Figure 2 for further review.



*Figure 2.* Mean of scores emphasized interpretation rank plotted with 95% confidence interval, based on standard deviation. Lower ranks (closer to 1) indicate greater emphasis.

Furthermore, despite being regularly interpreted with relatively high weight, 50% of instructors report teaching students to interpret overall scores (e.g., Full Scale IQ from the WISC-V) with caution when a significant (e.g., greater than 22 points between indices) discrepancy exists between component parts. Twenty-eight percent teach students not to interpret

the overall score in such cases while slightly fewer, 22%, teach students that such a discrepancy does not affect interpretation.

### **Assignments and Course Activities**

Not surprising, the vast majority (99%) of instructors require at least one test administration, with most instructors (94%) requiring 12 or fewer test administrations during the course of the semester. The average number of traditional administrations (i.e., pen and paper) was 7.8 ( $SD = 4.3$   $mdn = 8$ ), while the average number of tablet-based test administrations was 0.42 ( $SD = 1.7$ ;  $mdn = 0$ ). The majority of instructors (86%) do not require any tablet-based administrations. Furthermore, when calculating norm-referenced scores (i.e., determining standard scores and percentile ranks based on test norms), the majority of students use tables in a technical manual (61% of administrations) as opposed to using computer- or web-based software programs. For that matter, 16% of instructors only require students to calculate norm-referenced scores via technical manuals while 12% only require students to use computer- or web-based software.

Instructors reported that students are required to complete video-taped administrations (78%), unobserved administrations (55%), administrations with an observer physically present (44%), and audio-taped administrations (4%). In addition, 98% report completing protocol reviews, and a smaller portion (33%) have students complete scripted (i.e., simulated) administrations. Students are largely responsible (84%) for locating examinees for administrations, though test kits are available from the department (98%). In preparing students to administer instruments, the majority of instructors (83%) have students observe at least one test administration. Of those, 43% have students observe an administration in person (i.e., in the

same room or behind a one-way mirror), 18% have students observe by video, and 21% have students observe both in person and video models.

In addition to test administration, observations, and protocol reviews, many participants report assigning a variety of other evaluation strategies. For instance, most participants (97%) report having students complete at least one written report, with most instructors (87%) providing their students with a specific model report or template. Moreover, students are asked to complete case conferences and feedback sessions (54%), class presentations (63%), quizzes (47%), mid-terms (44%), finals (62%), literature reviews (15%), and reviews of journal articles (24%). Other assignments (20%) are also assigned and include reviews of case studies, discussions, reading reflections, ethical/legal dilemma assignments, and self-reflections on administrations.

Of the 24% of participants who reported using journal articles, participants reported assigning articles on general assessment (67%) and intelligence (54%) the most, with articles on evidence-based practices (43%) and factor analysis (41%) by less than half. A fifth of participants assigned reading on clinical judgment, while even fewer (9%) assigned readings on behavior management during testing. In addition to these topics, participants reported assigning other topics (14%) including test bias, adaptive assessment, intelligence theory (e.g., CHC theory), the Flynn Effect, RTI, and culturally competent practice.

### **Tests Featured in the Course**

The Wechsler Adult Intelligence Scales, Fourth Edition (WAIS-IV; Wechsler, 2004), Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V; Wechsler, 2014), and the Woodcock-Johnson Fourth Edition (WJ IV) Test of Cognitive Abilities (COG; Schrank, McGrew, & Mather, 2014) are most emphasized across courses, with 95% of instructors

requiring at least one administration of the WISC-V, 71% requiring at least one administration of the WJ IV COG, and 51% requiring at least one administration of the WAIS-IV. Nonverbal tests (e.g., the Universal Nonverbal Intelligence Test, Second Edition) are often taught but not administered. Moreover, a small proportion of instructors (6%) teach non-cognitive measures, such as the WJ IV Tests of Achievement (Shrank, Mather, McGrew, 2014) and the Behavior Rating Inventory of Executive Functions, Second Edition (Gioia, Isquith, Guy, & Kenworthy, 2013) during the initial cognitive assessment course. See table 4 for more detailed information regarding the reported tests used.

Instructors reported that several factors had great emphasis on which tests they selected to cover in their course, including whether a test is widely used at the national (98%) or regional (91%) level, expectations of field placements (93%), psychometric properties of the test (91%), underlying theory of intelligence (91%), and the validity of test results across diverse populations (91%). In addition, instructors reported that the availability of test kits (74%) and instructor familiarity with the tests (62%) were considered. See Table 5 for more detail.

### **Textbooks and Equipment**

The majority of instructors (56%) reported requiring *Sattler's Assessment of Children: Cognitive Foundations* (edition unspecified; e.g., Sattler, 2018), while an additional 20% supplemented their course with this textbook. Various textbooks from the *Essentials of Psychological Assessment* (<https://www.wiley.com/WileyCDA/Section/id-825851.html>) series are required by one-third of instructors (35%) and used as supplements in an additional one-quarter (24%) of courses. Next, Flanagan's *Contemporary Intellectual Assessment* (edition unspecified; e.g., Flanagan & McDonough, 2018) was required by roughly a third (32%) of faculty, with an additional 19% using it as a supplement. Kranzler and Floyd's *Assessing*

*Intelligence in Children and Adolescents* (2013) was required by 17% of instructors and used as a supplement by an additional 13%. Textbooks, such as those from Kaufman's intelligent testing series (7% required; 11% supplemented) and Haynes, Smith, and Hunsley's (2011) *Scientific Foundations of Clinical Assessment* (1% required; 4% supplemented) were also reported. In addition, a number of practitioners reported requiring (9%) or supplementing (2%) with textbooks from Groth-Marnat and Wright (2016), Weiss, Saklofske, Holdnack, and Prifitera (2015), Dombrowski (2014), or Lyon, Fletcher, Fuchs, and Barnes (2018).

### **Discussion**

The graduate course on cognitive testing within school psychology programs not only functions to teach students to administer cognitive tests, but also to familiarize individuals with the assessment process, to establish long-term assessment behaviors (Alfonso et al., 2000; Sotelo-Dynega & Dixon, 2014; Wilson & Reschly, 1996), and to foster in students a sense of professional identity (e.g., Oakland & Jimerson, 2006). Given this crucial role, it is important to fully understand the contemporary nature of the course on cognitive testing. While previous studies have explored these issues (Alfonso et al., 2000; Oakland & Zimmerman, 1986), the aim of this study was to identify current training practices and investigate how those practices have changed over the past two decades. Furthermore, we were interested in how current training aligns with current practice and the push for evidence-based assessment in school psychology (McGill, 2019), especially as it pertains to test interpretation.

### **Similarities**

We found that many of the aspects of the cognitive testing course examined by Alfonso and colleagues (2000) remain unchanged. Classes continue to be largely taught by doctoral faculty who generally use a TA, though the number of full-time assistants has decreased. The

course is still largely held during one semester and awarded three credits. The number of students enrolled in the courses are similar to that reported two decades ago, and those students are typically non-doctoral students. This consistency in student enrollment is likely due to the student to faculty requirements as outlined in NASP's *Standards for Graduate Preparation of School Psychologists* (NASP, 2010b).

While the exact content and available resources have changed over the past 20 years, the general emphases of the course remain similar. For instance, the topics of quantitative versus qualitative assessment and the interpretation of tests from supported theoretical frameworks remain moderately to highly emphasized by instructors, despite significant changes in the theoretical conceptualization of cognitive ability (i.e., the proliferation in use of CHC theory and related approaches; Schneider & McGrew, 2018) since Alfonso and colleagues' (2000) survey. Conversely, there were no marked differences between the percent of instructors' focus on EBD, giftedness, infants and preschoolers, or the ban on cognitive assessment compared to data from 1996 (Alfonso et al., 2000). In general, these topics are not the focus of most cognitive assessment courses.

Instructors continue to rely heavily on test administrations, scoring protocols, and report writing as the primary approaches to measuring student growth in the course. This is understandable given the first function of the course—to teach students to administer cognitive tests. As observed by Alfonso and colleagues (2000), the Wechsler Intelligence Test for Children (WISC) continues to be the most frequently taught cognitive test. Given that the WISC has historically been frequently taught across programs, and due to the influence of graduate training on professional practice (Sotelo-Dynega & Dixon, 2014; Wilson & Reschly, 1996), perhaps it is

no surprise that the WISC maintains such a commanding presence among practitioners (Benson et al., 2018).

### **Differences**

While much has remained unchanged over the past 20 years, there have been a number of significant shifts in how the course is taught. As previously noted, while the majority of faculty continue to be employed full-time, the number of courses taught by tenure-track faculty is lower than estimates reported in both Alfonso and colleagues (2000) and Oakland and Zimmerman's (1986) studies. Additionally, there has been a significant decrease in the reported practical experience of instructors in either school or clinical settings. Participants also indicated that TAs possess less previous experience with cognitive assessment and less advanced assessment course experience (cf. Alfonso et al., 2000). These changes are generally not of the type we would like to see, though other changes have been positive.

Instructors are placing greater emphasis on child and adolescent development and multicultural sensitivity/CLD assessment than in previous decades. This increased emphasis is no doubt linked to increased awareness, the increasing rate of students from diverse backgrounds (U.S. Department of Education, 2014) and national efforts to emphasize culturally competent practice (e.g., NASP Strategic Plan, 2017). Additionally, a focus on practical applications of cognitive testing, such as use in ID and SLD assessment, have increased since Alfonso and colleagues (2000) study was completed.

With a larger variety of textbooks for instructors to choose from we have seen a decrease in use of Sattler's textbook; though it remains the most frequently required textbook. As previously mentioned, the contemporary WISC remains the most frequently taught cognitive test; however, we noted a significant decrease in the use of the Wechsler Adult Intelligence Scale



and the Wechsler Preschool and Primary Scales of Intelligence from Alfonso and colleagues' (2000) and Oakland and Zimmerman's (1986) estimates. These findings suggest that the intellectual assessment of preschoolers and assessment of adults are less of a focus. Perhaps the most notable change in instrument selection in the past 20 years is the supplanting of the Stanford-Binet with the WJ IV COG. This finding is consistent with Benson and colleagues' (2018) data that suggest an increase in use of the WJ IV COG and a decrease in use of the Stanford-Binet by practitioners and is potentially due to the rise in the prominence of CHC theory and related instruction, which the WJ IV COG heavily espouses. Perhaps related to the CHC theory's emphasis on broad ability factors, results suggest a marked decrease in coverage of interpretation of subtests in the course.

### **Interpretation of Cognitive Tests**

Disagreement regarding the interpretation of cognitive tests has been a concern of researchers and practitioners for decades (Kamphaus, Winsor, Rowe, & Kim, 2018) and Alfonso and colleagues (2000) suggested that future research should explore trends regarding which interpretive strategies are being taught in graduate courses. Over the past two decades, the majority of instructors have begun teaching students to structure their interpretation of cognitive tests to be consistent with CHC theory, with a majority teaching related strategies (e.g., XBA and PSW) as well. While understanding the prominence of CHC is important, variations in interpretive strategies warrant focus on different scores produced by cognitive tests.

Most instructors are encouraging their students to interpret indices of general cognitive ability, second-order composites, and comparisons between second-order composites. This emphasis is consistent with practices based on CHC theory (McGrew & Schneider, 2018) and related practices (e.g., Flanagan et al., 2018), and with interpretation strategies reported by

clinicians (Sotelo-Dynega & Dixon, 2014). Moreover, these findings remain partially consistent with Sattler's (2018) successive levels approach and Kaufman's intelligent testing approach (e.g., Kaufman, Raiford, & Coalson, 2016). While the interpretation of subtests and various methods for comparing subtests has been largely eschewed in the empirical literature (see McGill et al., 2018), many instructors continue to provide instruction about these methods—though they rank lower in importance, on average, than other score types. This pattern is consistent with our finding that the emphasis on subtests has decreased since 1996 (Alfonso et al., 2000). In addition to the interpretation of various scores, rules regarding when to interpret or not interpret indices of general cognitive ability remain widely used despite a lack of supporting evidence (e.g., McGill, 2016; Kaufman et al., 2015).

### **Limitations and Future Research**

Using multiple methods of recruitment led to obtaining a larger sample size than those previously obtained by Alfonso et al. (2000) and Oakland and Zimmerman (1986), but also prohibited (a) the calculation of overall response rate and (b) determining the number of programs represented. Future researchers should consider methods that would permit more selective and proactive recruitment. A second general limitation is associated with the use of self-report and retroactive report. To supplement these data and to address this limitation, future researchers may consider gathering permanent products representing the course on cognitive assessment, such as syllabi or course rubrics.

We were unable to gather information on other important issues related to the cognitive testing course. For instance, future researchers may be interested in exploring the percentage of time preparing for and teaching the course of cognitive assessment. We also believe that it would be important to better understand aspects of assessment behaviors that are taught during the

course, such as which strategies and procedures are being taught for use with CLD students, strategies for test selection, and strategies for integrating achievement test data and curriculum-based measures. Moreover, a significant portion of our discussion focuses on those aspects of the cognitive assessment course that have remained the same or changed over the past two decades. However, our survey included items that were not included (e.g., interpretation strategies) by Alfonso and colleagues (2000) or Oakland and Zimmerman (1986); likewise, previous surveys included items (e.g., instructor preparation and teaching time) that we did not include. These differences limited our capacity to directly compare all items across time. Finally, while we focused on trainer's perspectives on the initial course, student's perspectives of the cognitive assessment course, its content, and its structure may be informative. Future research may wish to examine the degree to which trainer and trainee perceptions align.

### **Implications**

There are multiple possible implications that may be inferred from our findings. First, our survey indicated a decrease in the level of previous training of TAs, a decrease in the percentage of trainers with applied assessment experience, and a decrease in the percentage of full-time faculty teaching this course. This observation is consistent with the general trend of hiring contingent faculty (i.e., full- and part-time faculty not on the tenure track; Hurlburt & McGarrah, 2016). Regardless of the reason, this decrease in training and experience may affect the quality of training that students are receiving in cognitive assessment during this crucial introduction and therefore their practice as clinicians.

Results also suggest an increased emphasis on culturally linguistically responsive and culturally competent assessment practices compared to previous surveys. This is encouraging as roughly half of U.S. students are now considered CLD (U.S. Department of Education, 2014)

and the Individuals with Disabilities Education Act (IDEA §300.304, Evaluation Procedures) has called upon practitioners to use non-discriminatory assessment practices including the ability to administer tests in the child's native language. It is hoped that this increased emphasis will lead to improved competency in practice in this highly needed area, a shift that is long overdue.

Another apparent trend in the data is a shift away from adult and preschool assessment, which likely represents an increased specialization on K-12 evaluation. This shift would appear logical as, due to IDEA part c, much of the responsibility for preschool assessment has moved out of the realm of education in many states (e.g., Alabama Department of Rehabilitation Services, n.d., Arizona Department of Economic Security, n.d.). The implication of this finding is that many school psychologists may lack the knowledge of early child development and experience with preschool psychological assessment and may need to gain this foundational knowledge through other coursework and practical experience. A final trend is the movement towards interpretation based in CHC theory.

## **Conclusions**

The instructor of a school psychology graduate student's cognitive testing course has a vital role to play in the student's mastery of skills, long-term practice behaviors, and professional identity. Given these crucial functions, the content and structure of the initial course on cognitive testing should be heavily considered in light of empirical findings related to cognitive theory, practice, and utility. As many school psychologists' behavior are so strongly influenced by their first assessment course, instructors may well serve their students by challenging them to be adaptive to changes related to evidence and to advocate for more responsible, evidence-based assessment practices. This study provides a snapshot of the cognitive testing course in 2018; however, a more important question may be, "what do we want it to be in 2028?"



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Table 1

*Participant Data*

	%	<i>n</i>
Degree		
Doctoral (Ed.D., Ph.D., or Psy.D.)	92.9%	118
Educational specialist	20.5%	26
Masters (M.A., M.Ed., M.S.)	29.1%	37
Certifications & Licensures		
American Board of School Neuropsychology	1.6%	2
Licensed Psychologist	40.9%	52
Licensed/Certified School Psychologist	59.1%	75
Nationally Certified School Psychologist	51.2%	65
Other license type (e.g., Educational Psychologist; Psychological Associate)	2.4%	3
Other Qualifications		
Applied clinical experience (e.g., in a mental health setting)	39.4%	50
Public or private school experience	51.2%	65
Other experience (e.g., cognitive assessment research)	3.9%	5
Faculty Status		
Full-time faculty	61.4%	78
Part-time & Student Instructors	12.5%	14

*Note.* *n* = 127.



Table 2

*Represented Program Data*

	%	<i>n</i>
Department Type		
Education	11.8%	15
Educational Psychology	21.3%	27
Guidance and Counseling	3.9%	5
Psychology	37.8%	48
School Psychology	11.8%	15
Special Education	2.4%	3
Combined (e.g., Counseling and Educational Psychology)	6.3%	8
Other	4.7%	6
Program Status		
APA Accredited Program	80.4% <sup>a</sup>	45
NASP Approved	79.5%	101
Neither	14.2%	18
School Psychology Degrees Offered		
Master of Arts	16.5%	21
Master of Education	7.9%	10
Master of Science	14.2%	18
Educational Specialist	59.1%	75
Doctorate of Education	1.6%	2
Doctorate of Philosophy	34.6%	44
Doctorate of Psychology	8.7%	11
Other	14.2%	18
	<i>m (sd)</i>	range
Number of full-time graduate students	35.34 (20.59)	0 to 99

Number of part-time graduate students	4.88 (13.38)	0 to 99
Number of full-time school psychology faculty	3.83 (1.95)	0 to 12
Number of part-time school psychology faculty	1.19 (1.29)	0 to 10
Number of adjunct school psychology faculty	2.80 (4.01)	0 to 30

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*Note.* n = 127. a = Only programs that reported offering a doctoral degree were included in this calculation.

Table 3

*Emphasis Placed on Topics Featured in Cognitive Assessment Coursework*

Topic/Subtopic	Percentage of Sample Indicating amount of emphasis placed on course topics				
	Great Emphasis	Moderate Emphasis	limited Emphasis	Not Covered	Mean (SD)a
Human Development					
Infant	2.40	10.20	34.60	51.20	3.37 (0.77)
Child	78.00	9.40	7.10	5.50	1.4 (0.85)
Adolescent	70.90	15.00	7.10	7.10	1.5 (0.91)
Adult	7.90	18.10	37.00	33.90	3 (0.93)
Assessing Diverse Populations					
Culturally and/or linguistically diverse	51.20	42.50	6.30	0	1.55 (0.61)
Emotional/behavioral disturbance (EBD)	14.20	31.50	30.70	20.50	2.59 (0.98)
Giftedness	6.30	29.10	47.20	14.20	2.72 (0.80)
Infants and preschoolers	6.30	25.20	48.80	15.70	2.77 (0.80)
Intellectual and developmental disabilities	41.70	48.00	9.40	0.80	1.69 (0.67)
Multiple and severe disabilities	9.40	27.60	40.20	17.3	2.69 (0.89)
Current Issues Related to Cognitive Assessment					
Effect of labeling in education	43.30	30.70	16.50	6.30	1.85 (0.93)
Ban on cognitive assessment (Larry P.)	15.70	24.40	42.50	14.20	2.57 (0.93)
Interpreting tests from empirically supported theoretical frameworks	63.00	27.60	6.30	0.80	1.44 (0.65)
Multicultural sensitivity	59.10	31.50	5.50	1.60	1.48 (0.68)
Quantitative v. qualitative assessment	33.10	40.20	20.50	4.70	1.97 (0.86)
Use of cognitive assessment in specific learning disability identification	47.20	42.50	7.10	1.60	1.62 (0.69)
Use of subtest scores	18.90	29.10	43.30	4.70	2.35 (0.85)

*Notes.* a = Greater emphasis = 1, moderate emphasis = 2, limited emphasis = 3, and no coverage = 4. Lower means indicate greater overall emphasis.

Table 4

*Percentage of sample indicating whether a test was administered by students or only taught*

Test	Percentage of Sample Indicating whether a test is administered or taught	
	Admin	Taught
Cognitive Assessment System, Second Edition	3.90	15.00
Comprehensive Test of Nonverbal Intelligence, Second Edition	7.10	24.40
Differential Ability Scale, Second Edition	22.80	25.20
Kaufman Adolescent and Adult Intelligence Test	2.40	4.70
Kaufman Assessment Battery for Children, Second Edition, Normative Update	30.70	26.00
Leiter International Performance Scale, Third Edition	0.80	19.70
Reynolds Intellectual Assessment Scales, Second Edition	7.10	13.40
Stanford-Binet Intelligence Scales, Fifth Edition	27.60	26.80
Universal Nonverbal Intelligence Test 2	15.70	29.10
Wechsler Abbreviated Scale of Intelligence, Second Edition	4.70	15.70
Wechsler Adult Intelligence Scale, Fourth Edition	51.20	15.00
Wechsler Intelligence Scale for Children, Fifth Edition	94.50	8.70
Wechsler Nonverbal	10.20	20.50
Wechsler Preschool & Primary Scale of Intelligence, Fourth Edition	32.30	20.50
Woodcock-Johnson Fourth Edition Tests of Cognitive Abilities	70.90	19.70
Older version	0.80	0.80
Other Test	4.70	3.90

*Note.* n = 127.

Table 5

*Factors Influencing Test Selection*

Reason	Amount of Consideration Given to Factors Determining Test Selection			
	Great	Moderate	Limited	No Consideration
Availability of Test Kits	51.20	22.20	18.90	7.10
Expectations of Field Placements	70.10	22.80	7.10	0.00
Instructor familiarity with test	15.7	45.70	26.80	10.20
Psychometric properties of test scores	65.40	26.00	7.90	0.80
Underlying theory of intelligence	54.30	37.00	7.90	0.80
Validity across diverse populations	55.10	36.20	7.90	0.80
Widely used test (nationally)	75.60	22.80	1.60	0.00
Widely used test (regionally)	69.30	21.30	7.10	1.60

*Note.* a = lower means indicate greater consideration, with greater consideration = 1, moderate consideration = 2, limited consideration = 3, and no consideration = 4. Four participants reported budget considerations received moderate or limited consideration.