

A Dissertation
Submitted to Faculty
of
Xavier University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Psychology
by
Rachel Holden, M.A.
February 26, 2016

Approved:

Karl Stukenberg, Ph.D., ABPP

Karl Stukenberg, Ph.D., ABPP
Chair, Department of Psychology

W. Michael Nelson III, PhD, ABPP
W. Michael Nelson III, Ph.D., ABPP
Dissertation Chair

Psychometric Properties of the
Adaptive Behavior Assessment System- Second Edition
with Adults Diagnosed with Intellectual Disability

Dissertation Committee

Chair	W. Michael Nelson III, Ph.D., ABPP Professor of Psychology
Member	Kathleen J. Hart, Ph.D., ABPP Professor of Psychology
Member	William Moore, Ph.D. Clinical Psychologist Supervisor Southwest Ohio Developmental Center
Member	Meredith N. Will, Ph.D. Kelly O'Leary Center

Acknowledgments

I would like to express sincere appreciation to my dissertation chair, Dr. W. Michael Nelson III, for his endless patience, guidance, and support through the research process. Thank you to my committee, Drs. Hart, Moore, and Will for your questions, ideas, and suggestions for making this dissertation representative of my best work, and to the other faculty who lent their expertise as I developed and carried out this study. I also would like to sincerely thank Southwest Ohio Developmental Center for allowing this research to be conducted, and especially to the direct care staff who served as informants.

This endeavor would not have been possible without the encouragement and friendship of those in my cohort. Thank you also to my family for your support throughout this process. Finally, I would like to express my deepest gratitude to my dear husband, who has loved me and believed in me every step of the way. I couldn't have done it without you.

Table of Contents

	Page
Table of Contents.....	5
List of Tables.....	6
List of Appendices.....	7
Abstract.....	8
Dissertation.....	9
References.....	30
Tables.....	39
Appendices.....	42

List of Tables

	Page
Frequencies and Percentages of Comorbid Psychiatric Disorders.....	39
Means and Standard Deviations of Measures for Total Sample	40
ABAS-II Reliability and Validity Correlations of Past Studies and Current Study.....	41

List of Appendices

	Page
IRB Approval Letters.....	42
Human Rights Permission Letter.....	44
Summary.....	45

Abstract

The shift in emphasis on adaptive functioning when specifying severity level of Intellectual Disability (ID), as stated in the DSM-5 (APA, 2013), increases the need for reliable and valid adaptive functioning measures for clinicians to utilize during diagnostic evaluations. This study investigated the psychometric properties of a widely-used adaptive functioning measure, the Adaptive Behavior Assessment System- Second Edition, with adults (ABAS-II; Harrison & Oakland, 2003). Participants included 102 adults with ID, ages 18 to 79 years, who resided at a Midwestern developmental center. Test-retest and inter-rater reliability were demonstrated for the ABAS-II General Adaptive Composite (GAC) and domain scores. Additionally, concurrent validity was also demonstrated with the Vineland Adaptive Behavior System- Second Edition (VABS-II) by statistically significant correlations for GAC and domain scores, as well as with the Wechsler Adult Intelligence Scale- Fourth Edition (WAIS-IV) and the Stanford Binet- Fifth Edition (SB-V) IQ scores. Past research indicates that comorbid psychiatric disorders and behavior/emotional symptoms impact the adaptive functioning of individuals with ID differently (Di Nuovo & Buono, 2007; Lopata et al., 2012). Therefore, it seemed likely that individuals displaying behavior or emotional problems/symptoms would weaken the reliability of an informant-rated instrument. Although the ABAS-II test-retest reliability coefficients were not significantly different between two groups (individuals who scored above and below the clinical threshold for comorbid behavioral/emotional problems), inter-rater reliability coefficients for the GAC and Practical domain scores were. These findings can be cautiously extended to the recently published ABAS-3 (Harrison & Oakland, 2015) as there is significant overlap between these two editions.

**Psychometric Properties of the Adaptive Behavior Assessment System- Second Edition
with Adults Diagnosed with Intellectual Disability**

In the field of developmental and Intellectual Disability (ID), one's ability to demonstrate vital daily life activities has been referred to as "adaptive behavior" or "adaptive functioning" (American Association on Intellectual and Developmental Disabilities [AAIDD], 2010; American Psychiatric Association [APA], 2013; Gleason & Coster, 2012). Generally, the concept of adaptive behavior refers to one's capacity to progressively assume responsibility for one's self and eventually aide others in completion of daily life skills (Oakland & Algina, 2011). Adaptive behavior has been defined as the performance of daily activities that are required for personal and social sufficiency; in other words, one's ability to demonstrate self-sufficiency in a variety of environments (Sparrow, Cicchetti, & Balla, 2005). Adaptive behavior includes behavioral skills that individuals usually display when responding to and coping with the physical and sociocultural environmental stressors they encounter (Loveland & Tunali-Kotoski, 1998). Adaptive behavior progresses along a developmental trajectory and is not static; rather, the level of functioning can fluctuate and vary during the course of one's life, depending on the level of supports needed by the individual (APA, 2010; Soenen, Van Berckelaer-Onnes, & Scholte, 2009).

Historically, adaptive behavior has been recognized as multidimensional, consisting of maturation, learning, and social adjustment (AAIDD, 2010). In 1992, the AAIDD stressed the significance of 10 specific adaptive skills: Communication, Community Use, Functional Academics, School/Home Living, Health and Safety, Leisure, Self-Care, Self-Direction, Social, and Work (AAIDD, 1992; Oakland & Algina, 2011). More recent research has identified the factor structure of adaptive behavior as consisting of the following: conceptual skills, social

skills, and practical skills (AAIDD, 2002; AAIDD, 2010; Beail, 2003; Harrison & Oakland, 2003). In 2002, the AAIDD revised the definition of adaptive behavior and categorized the 10 previously identified skill areas into the three domains: conceptual, social, and practical skills (AAIDD, 2002; Beail, 2003). Professionals have since been encouraged to use assessment measures of adaptive functioning that are consistent with these definitions (Oakland & Algina, 2011).

According to the DSM-5 (APA, 2013), the Conceptual domain refers to skills in memory, language, reading, writing, math reasoning, problem solving, acquisition of practical knowledge, and judgment in novel situations. The Social domain refers to awareness of others' thoughts, feelings, and experiences, empathy, interpersonal communication skills, friendship abilities, and social judgment. The Practical domain refers to learning and self-management across life settings, including personal care, job responsibilities, money management, recreation, self-management of behavior, and school and work task organization. The criterion of *impaired* adaptive functioning is met when at least one domain (conceptual, social, or practical) is significantly impaired to the point that ongoing support is necessary in order for the individual to perform adequately in one or more environments, such as at school, home, work, or in the community (APA, 2013).

Assessment of Intellectual Disability and Adaptive Functioning

Diagnosis of ID requires assessment of both intellectual functioning and adaptive behavior (AAIDD, 2010; APA, 2013; Mash & Barkley, 2007). When an individual's IQ score is at least two standard deviations below the mean (i.e., ≤ 70), and at least one area of adaptive functioning is significantly impaired, s/he meets criteria for ID (AAIDD, 2010; APA, 2013). An ID diagnosis is then specified by the severity level of the disability: Mild, Moderate, Severe, or

Profound (APA, 2013). The DSM-5 (APA, 2013) states that the severity level of ID should be specified based on the individual's adaptive functioning level, which differs from past editions of the DSM where the severity of ID was based on one's intellectual impairment, or IQ score (APA, 2000; APA, 1994; APA, 1987; APA, 1978; APA, 1968). Therefore, although assessment of adaptive functioning has had a substantial history in the field of developmental and intellectual disabilities, there has been a clear shift when specifying severity level of ID, reflecting more of an emphasis on the practical consideration of adaptive functioning (APA, 2013; Harrison & Oakland, 2015).

Adaptive functioning is relevant not only in diagnostic evaluations, but in treatment goal development and intervention planning as well (Harrison & Oakland, 2003; Oakland & Algina, 2011). An individual's adaptive behavior score and disparities between this and their cognitive functioning score play an important role in treatment planning (AAIDD, 2010; APA, 2013; Atkinson, 1990; Balboni et al., 2001; Harrison & Oakland, 2003; Milne & McDonald, 2015; Milne, McDonald, & Comino, 2012; Tomanik, Pearson, Loveland, Lane, & Shaw, 2007). Therefore, evaluating one's adaptive behavior results in helpful information for the development and implementation of educational and rehabilitative interventions that are individually designed to increase adaptive and coping skills in response to the environment (AAIDD, 2010; APA, 2013; Balboni et al., 2001; Harrison & Oakland, 2003; Milne & McDonald, 2015; Milne, et al., 2012; Tomanik, et al., 2007).

Comprehensive and continuing research on widely-used adaptive functioning measures is vital in order to provide for accurate diagnosis and effective treatment planning. Several instruments have been created to measure adaptive functioning in children and adults: Adaptive Behavior Assessment System – Third Edition (Harrison & Oakland, 2015), Comprehensive Test

of Adaptive Behavior – Revised (Adams, 1999); Scales of Independent Behavior – Revised (Bruininks, Woodcock, Weatherman, & Hill, 1996); and Vineland Adaptive Behavior Scales – II (Sparrow et al., 2005). In addition to psychometrically-sound measures, clinical evaluation and additional sources of information, such as educational, developmental, medical, and mental health evaluations can aide in the assessment of one’s adaptive functioning (APA, 2013).

Adaptive Behavior Assessment System – Second Edition (ABAS-II)

The ABAS-II (Harrison & Oakland, 2003) is a widely-used adaptive functioning measure for individuals from birth to 89-years of age. The ABAS-II is structured based upon the current AAIDD definition of ID and guidelines, state and federal special education classification systems, and the DSM-IV-TR (APA, 2000). It is the only adaptive measure that directly assesses the 10 adaptive skills that compose the definition of ID by the AAIDD (2002) and APA (2000; Harrison & Oakland, 2003). These ten skill areas combine to produce a General Adaptive Score (GAC) and three domain composite scores: Conceptual (Communication, Functional Academics, and Self-Direction), Social (Social Skills and Leisure), and Practical (Self-Care, Home Living, Community Use, and Health and Safety; Harrison & Oakland, 2003).

Psychometric Properties of the ABAS-II

Four types of reliability were initially investigated during the development of the ABAS-II: internal consistency, test-retest reliability, inter-rater reliability, and cross-form reliability (Harrison & Oakland, 2003). Internal consistency reliability coefficients across the standardization samples of the ABAS-II ranged from .97 to .99. Average reliability coefficients of the adaptive domains ranged from .91 to .98, while average reliability coefficients of the skill areas ranged from .80 to .97. Internal consistency reliability was also analyzed by levels of performance and different clinical diagnoses. Overall, the internal consistency reliability of the

ABAS-II provided evidence that scaled scores for the ten skill areas, adaptive domains, and the General Adaptive Behavior score reflect a high degree of internal consistency (Harrison & Oakland, 2003).

When investigating test-retest reliability, test-retest time intervals for the ABAS-II Adult Form, Rated by Others, ranged from three days to six weeks, averaging 12 days (Harrison & Oakland, 2003). Reliability coefficients for the General Adaptive Behavior scores of 52 adults were mostly in the .90s, coefficients for adaptive domains were mostly in the upper .80s and .90s, and coefficients of the ten skill areas ranged from the .70s-.90s, indicating high test-retest reliability (Harrison & Oakland, 2003).

On the Adult Form of the ABAS-II, the inter-rater reliability coefficients of the General Adaptive Composite scores of 52 adults rated by two respondents were .89 (without the Work Skill Area) and .93 (with the Work Skill area). The inter-rater reliability coefficients of the adaptive domain scores averaged .87, while the coefficients for the skill areas averaged .82 (Harrison & Oakland, 2003).

For the adult sample, the cross-form reliability was examined using self-report scores and ratings by others of 105 adults. The following correlation coefficients were found: General Adaptive Composite score without Work skill area = .95; General Adaptive Composite score with Work skill area = .93; Adaptive domains = .91; Skill area scores = .88 (Harrison & Oakland, 2003).

In terms of the validity of the ABAS-II, content validity and factor analysis studies with the adult form and adults samples are reported in the ABAS-II manual (Harrison & Oakland, 2003). While several concurrent validity studies were conducted with children and adolescent samples, two were conducted with adults: a non-clinical sample ($n = 37$) comparing the ABAS-II

and the WAIS-III, and a clinical demographic sample (Intellectual Disability-Unspecified, $n = 30$; Alzheimer's Disease, $n = 25$; Neuropsychological Disorders, $n = 20$; Harrison & Oakland, 2003).

Since the publication of the ABAS-II in 2003, limited research has been conducted to further investigate the psychometric properties of the ABAS-II with specific populations, particularly adults with ID. Makary et al. (2015) investigated the relationship between adaptive behavior and age in adults with Down syndrome without dementia, utilizing the ABAS-II to measure adaptive behavior. Results demonstrated that increasing age in this population was significantly associated with lower adaptive behavior abilities for the GAC, Social and Conceptual domain scores. Although multiple studies have utilized the ABAS-II with child and adolescent samples (Koriakin et al., 2013; Lindblad, et al., 2013; Lopata, et al., 2012; Milne & McDonald, 2015; Papazoglou, Jacobson, & Zabel, 2013; Papazoglou, Jacobson & Zabel, 2013; Pogge, et al., 2014), adults with ID samples are lacking. Extending research on the psychometric properties and utility of psychological instruments is a joint responsibility of the test developers and users, especially in various applied and research settings (Harrison & Oakland, 2003). It is clear, however, that further research on the psychometric properties of the ABAS-II with specific populations, namely with adults with ID, is necessary in order to advance its utility with this population. This remains the case even though the new ABAS-3 has recently been published as there is a very high level of similarity between the two versions (Harrison & Oakland, 2015).

Impact of Psychiatric Diagnoses on Adaptive Functioning in Individuals with ID

Individuals with ID are not a homogenous group, and one way they can vary is the level of problematic behavioral/emotional symptoms they exhibit. Prevalence rates of an individual with ID having a comorbid psychiatric diagnosis range from 20-60% and are common to those

found in the general population, including: mood disorders, anxiety disorders, attention-deficit/hyperactivity disorder, and adjustment disorder (Summers, Boyd, & Morgan, 2004). A recent review of the literature by Buckles, Luckasson, and Keefe (2013) reported that prevalence rates for co-occurring psychiatric symptoms or disorders range from 13.9% to 75.2%, with most of this variation accounted for by differences in diagnostic criteria. Previous research also demonstrates that individuals with ID have an increased vulnerability to develop mental health problems (Cooper & Bailey, 2001; Deb, Thomas, & Bright, 2001; Emerson et al., 2001; Moss, 2001; Dekker et al., 2002; Einfeld et al., 2006; Whitaker & Read, 2006; Cooper et al., 2007). However, when investigating whether individuals with high versus low severity of ID are more likely to have a comorbid psychiatric disorder, the literature is conflicted (Kerker et al., 2004; Whitaker & Read, 2006).

Di Nuovo and Buono (2007) found that in individuals with ID, the comorbidity of schizophrenia, personality, and mood disorders resulted in less impairment of adaptive behavior than individuals with comorbid pervasive developmental disturbances, such as autism spectrum disorder (ASD). The adaptive functioning level of individuals with comorbid diagnoses of ADHD and epilepsy fell intermediately between these extremes (Di Nuovo & Buono, 2007). Thus, comorbid psychiatric disorders and behavior/emotional symptoms impact the adaptive functioning of individuals with ID differently.

Chitty, Boo, and Jamieson (1993) assessed rates of emotional disorders and behavior problems as measured by the Reiss Screen for Maladaptive Behavior (2009). Prevalence rates of these symptoms were found in 69% of a sample of 71 adults with ID who resided in a developmental center. In a similar study, 60% of a sample of 60 individuals with ID living in India met criteria for a mental health disorder when using ICD-10 criteria. The ICD-10 and the

RSMB were in agreement for 82% of these cases. Kishore, Nizamie, and Nizamie (2010) utilized this sample in an additional study and found that the RSMB was successful in identifying specific mental health conditions, with the exception of ASD. Additionally, the RSMB was included in a review by Matson, Belva, Hattier, and Matson (2011) that identified current scaling methods to measure psychopathology in persons with intellectual disabilities.

In the current study, most of the participants have co-occurring psychiatric and medical diagnoses. Therefore, it seems possible that due to individuals displaying behavior or emotional problems/symptoms, the reliability of an informant-rated instrument, such as the ABAS-II, may be compromised. This study investigated not only the psychometric properties (concurrent validity, test-retest reliability, and inter-rater reliability) for the ABAS-II, but also the impact of comorbid psychiatric disorders in a sample of adults with ID who reside in a state-funded developmental center. The ABAS-II was examined, rather than the ABAS-3, due to the more recent version not being published at the time of data collection.

Method

Participants/Residents

Recruited from a Midwestern institutional setting, participants were 102 adults with ID (71 male/69.6%, 31 female/30.4%; M age = 40.4 years, modal age = 27 years, age range: 18 to 79). This sample size met requirements for detecting a medium effect size with an alpha of .05 in a correlational design (Cohen, 1992). The majority race was reported as Caucasian (77 participants/75.5%) and 25 were reported as Black or African-American race (24.5%). With regards to ID severity level, 16 participants (15.7%) were diagnosed with Mild ID, 48 with Moderate ID (47.1%), 29 with Severe ID (28.4%), and 9 with Profound ID (8.8%). The state-run developmental center from which residents were recruited serves approximately 90-100 residents

on a cottage-style campus who require extensive support in daily living, health care, and/or social skills development. Participants were included in this study if they were at least 18 years of age and had a diagnosis of Intellectual Disability. A substantial portion of residents (approximately 14) were adolescents and, therefore, not included. Although participants constituted a convenience sample, all available residents that were recruited over a 9-month period of time were included.

The length of residential stay at the developmental center varies from as short as 30 days to as long as 30 years. In order for individuals to reside at the developmental center, they must have either ID or a developmental disability, such as ASD. More than 90% of residents at this facility are dually diagnosed with mental illness (see Table 1). The most common comorbid disorders were Disruptive, Impulse-Control and Conduct Disorders (37; 36%), Autism Spectrum Disorder (21; 21%), and Depressive Disorders (18; 18%).

Participants/Informants

Thirty-five direct care staff served as primary and secondary informants when completing the rating measures. Informants held the job title of Therapeutic Program Worker and their job responsibilities included providing direct care services and assisting clients/residents to function independently in self-help and daily living skills. Therapeutic Program Workers also participate in required, annual trainings, such as CPR, First-Aid, Verbal Behavior Management, Assaultive Behavior Management, etc.

Staff members who served as primary informants reportedly had worked at the facility and known the identified resident from one month to 30 years ($M = 65.29$ months, or 5.44 years/ $SD = 72.41$ months, or 6.03 years; modal duration = 60 months, or 5 years). Additionally, based on a 5-point Likert scale (1= Not Well, 3= Moderately Well, and 5= Very Well), the

primary informants reported that they knew the participants moderately to very well ($M = 4.6$; Mode = 5).

Measures

Adaptive Behavior Assessment System-II (Harrison & Oakland, 2003). The Adaptive Behavior Assessment System-II (ABAS-II) offers five different forms: Parent/Primary Caregiver Form, Teacher/Daycare Provider Form, Parent Form, Teacher Form, and Adult Form. Number of items range from 193 to 241, depending on the form, and are rated using a 4-point rubric (not able, never, sometimes, and always). The ABAS-II assesses adaptive behavior skills across three domains and 10 skill areas as previously described. The ABAS-II provides a General Adaptive Composite (GAC) score, which is an overall estimate of the individual's adaptive functioning. The GAC compares an individual's global adaptive skills to the adaptive skills of others in the same age group from the standardization sample. This measure yields raw scores, norm-referenced scaled scores, test age-equivalents, norm-referenced standard scores, age-based percentile ranks, and descriptive classifications: Extremely Low, Borderline, Below Average, Average, Above Average, Superior, and Very Superior (Harrison & Oakland, 2003).

Vineland Adaptive Behavior Scale – Second Edition (Sparrow, Cicchetti, & Balla, 2005). The Vineland Adaptive Behavior Scale- Second Edition (Vineland-II) is a widely-used measure of adaptive behavior skills in individuals, ages birth to 90 years (Sparrow et al., 2005). Four different forms of this measure are available for use: Survey Interview Form, Parent/Caregiver Rating Form, Expanded Interview Form, and Teacher Report Form. The Vineland-II assesses adaptive behavior skills across four domains and eleven subdomains: Communication (receptive, expressive, and written), Daily Living Skills (personal, domestic, and community), Socialization (interpersonal relationships, play and leisure time, and

coping skills), and Motor Skills (fine motor skills and gross motor skills). The Vineland-II provides an Adaptive Behavior Composite, which is an overall estimate of the individual's adaptive functioning. This measure yields raw scores, standard scores, percentiles, stanines, and adaptive levels for the Adaptive Behavior Composite (ABC) and each of the four domains. For each of the subdomains, raw scores, v-scale scores, adaptive levels, and age equivalents are provided. In addition, a Maladaptive Behavior Index can be calculated if this optional portion of the measure is administered (Sparrow et al., 2005).

Stanford-Binet Intelligence Scales – Fifth Edition (Roid, 2003). The Stanford-Binet Intelligence Scales – Fifth Edition (SB-V) is a widely-used measure of general intellectual functioning in individuals, ages 2 to 85 years (Roid, 2003). The SB-V yields a Full Scale Intelligence Quotient (FSIQ), which provides an estimate of current overall cognitive functioning. Additionally, a Nonverbal IQ score, Verbal IQ score, and Abbreviated IQ score are provided. The SB-V also provides five factor index scores: Fluid Reasoning, Knowledge, Quantitative Reasoning, Visual Spatial Skills, and Working Memory (Roid, 2003).

Wechsler Adult Intelligence Scale- Fourth Edition (Wechsler, 2008). The Wechsler Adult Intelligence Scale- Fourth Edition (WAIS-IV) is the most frequently administered intelligence test for older adolescents and adults, ages 16- to 90-years (Canivez, 2012; Schraw, 2012). The WAIS-IV yields a FSIQ which provides an estimate of current overall cognitive functioning. The WAIS-IV is comprised of 15 subtests which yield four factor index scores: Verbal Comprehension (four subtests), Perceptual Reasoning (five subtests), Working Memory (three subtests), and Processing Speed (three subtests; Schraw, 2012). However, only 10 of the 15 subtests are utilized to produce the FSIQ (Canivez, 2012).

Reiss Screen for Maladaptive Behavior: Revised Test Manual (Reiss, 2009). The Reiss Screen for Maladaptive Behavior (RSMB) is a 38-item screening measure used to identify possible dual diagnoses in individuals with ID, ages 16 years and older (Reiss, 2009). Respondents, which can vary from care providers, teachers, supervisors, and parents of the individual, indicate the extent to which each behavioral and emotional symptom is not a problem (score 0), a problem (score 1), or a major problem (score 2). Each item is accompanied by a definition and examples. The RSMB is organized into eight scales: Aggression, Autism, Psychosis, Paranoia, Depression (behavioral), Depression (physical), Dependent, and Avoidant. The total-score is derived by summing 26 of the 38 items that have available normative data. A cut-off score of nine is used to differentiate whether an individual should be further evaluated for comorbid diagnoses (Reiss, 2009).

A critique of the RSMB by Prout (1993) concluded that it is a useful screening measure; however, it needs a more comprehensive set of items. The RSMB has been validated with other established scales, such as the Aberrant Behavior Checklist and the Aberrant Behavior Scale-Part II, utilizing a sample of 284 individuals with ID living in the community (Walsh & Shenouda, 1999). Also, the RSMB was utilized to differentiate subtypes of maladaptive behaviors for 65 individuals with Prader Willi Syndrome (Hartley, MacLean, Butler, Zarcone, & Thompson, 2005). Stolder, Koedoot, Heerdink, Leufkens, and Nolen (2003) utilized the RSMB to examine problem behaviors and psychopathology experienced by adults with ID living in the community who were taking psychotropic medications. Additionally, Gustafsson and Sonnander (2002) developed a Swedish version of the RSMB.

Procedure

Approval was obtained through a Midwestern university's Institutional Review Board and through the developmental center's Human Rights Committee (see Appendix A and B). Prior to administering any psychological instruments, direct care staff members who would serve as the best primary and secondary informants for each participant were identified by the Qualified Intellectual Disability Professional (QIDP) and the Residential Care Specialist (RCS) staff members who manage residents' appointments, behavior plans, behavior data, and other resident issues. A consent form, which included a description of the study and right to refuse participation at any time, was provided to and signed by each informant.

Rating measures were completed over a 9-month period of time for residents that were available and recruited for this study. At Time Period 1, the primary informant completed the Vineland-II Survey/Interview form (to obtain concurrent validity), the ABAS-II, and the RSMB. The secondary informant also completed the ABAS-II at Time Period 1 to obtain inter-rater reliability. Based on the RSMB cut-off scores, participants were divided into two groups: individuals who scored below and above the threshold for clinically significant behavioral/emotional problems. Two weeks later, at Time Period 2, the ABAS-II was completed again by the primary informant to determine test-retest reliability. Additionally, the most recent IQ scores measured by the WAIS-IV or SB-V were retrieved from the residents' clinical charts to determine concurrent validity.

Results

The total sample means and standard deviations for each of the measures, as well as the two groups', based on the RSMB Total Scores, means and standard deviations are presented in Table 2. Based on the interpretation of test-retest reliability coefficients reported by Cohen and Swerdlik (2013), the reliability and validity coefficients found in the current study were

interpreted as “high” if the correlation coefficient was $\geq .90$, “moderate” if the correlation coefficient was between .80 and .89, and “weak” if the correlation coefficient was between .70 and .79.

In regard to test-retest reliability of the ABAS-II, significant correlations were found for the ABAS-II GAC scores, $r(93) = .90, p < .01$, Conceptual domain scores, $r(93) = .89, p < .01$, Social domain scores, $r(93) = .85, p < .01$, and Practical domain scores, $r(93) = .90, p < .01$, indicating moderate to high, two-week test-retest reliability ($n = 95$). Additionally, small Cohen’s d effect sizes were demonstrated for the ABAS-II GAC scores ($d = 0.08$), Conceptual domain scores ($d = 0.02$), Social domain scores ($d = 0.09$), and Practical domain scores ($d = 0.06$), indicating small differences between scores over a two-week period of time.

When two different raters completed the ABAS-II, significant correlations were found for the GAC scores, $r(99) = .82, p < .01$, and the Conceptual domain scores, $r(99) = .81, p < .01$, indicating moderate inter-rater reliability, while weaker inter-rater reliability was demonstrated for the Social domain scores, $r(99) = .71, p < .01$, and the Practical domain scores, $r(99) = .77, p < .01$ ($n = 101$). Additionally, small Cohen’s d effect sizes were demonstrated for the ABAS-II GAC scores ($d = 0.04$), Conceptual domain scores ($d = 0.0$), Social domain scores ($d = -0.02$), and Practical domain scores ($d = 0.03$), indicating small differences between scores when rated by two different informants.

In order to investigate the two week test-retest reliability coefficients of individuals who scored above and below the clinical threshold for behavioral/emotional problems (as defined by the RSMB Total Score, using a cut-off score of 9), Fisher’s r -to- z transformations were calculated to compare the correlations for statistically significant differences. No statistically significant differences were found between the ABAS-II GAC correlations ($z = 1.02, p = .31$),

Conceptual domain correlations ($z = .39, p = .70$), Social domain correlations ($z = .43, p = .67$), or Practical domain correlations ($z = 0.55, p = .58$), indicating similar test-retest reliability coefficients for those with and without emotional/behavioral difficulties.

As an exploratory analysis, r -to- z transformations were also calculated to compare any significant differences between the inter-rater reliability coefficients (ABAS-II General Adaptive Composite score, Conceptual domain score, Social domain score, and Practical domain score) for individuals who score above and below the clinical threshold for behavioral/emotional problems (as defined by the RSMB Total Score, using a cut-off score of 9). Statistically significant differences were found between the ABAS-II GAC ($z = -2.22, p = .03$) and Practical domain correlations ($z = 4.02, p = .001$), indicating rater differences for the ABAS-II General Adaptive Composite and Practical domain for those with emotional/behavioral difficulties. Significant differences were not found between the ABAS-II Conceptual domain correlations ($z = 0.55, p = .58$) or Social domain correlations ($z = .08, p = .48$).

In regard to the concurrent validity of the ABAS-II, significant, weak to moderate correlations were found for the ABAS-II GAC score and the Vineland-II ABC score, $r(100) = .74, p < .01$, ABAS-II Conceptual and Vineland-II Communication domain scores, $r(100) = .64, p < .01$, ABAS-II Social and Vineland-II Socialization domain scores, $r(100) = .62, p < .01$, and ABAS-II Practical and Vineland-II Daily Living Skills domain scores, $r(100) = .81, p < .01$, demonstrating concurrent validity ($n = 102$). Finally, concurrent validity of the ABAS-II with IQ scores (as measured by the WAIS-IV or SB-V based on chart review) resulted in expectedly lower, significant correlation coefficients $r(30) = .44, p < .05$ ($n = 32$).

Discussion

Historically, cognitive functioning has been the primary focus in the diagnosis of ID, both in diagnostic evaluations and research (de Bildt, Systema, Kraijer, Sparrow, & Minderaa, 2005). Although adaptive functioning has also been a criterion, its role became central with the fifth edition of the Diagnostic Statistical Manual (DSM-5; APA, 2013). Adaptive functioning is now the primary basis for determining severity levels (Mild, Moderate, Severe, and Profound) when diagnosing ID. Therefore, thorough exploration of adaptive functioning itself and the psychometric properties of the instruments utilized to measure adaptive functioning is imperative to not only determine severity level of ID (APA, 2013), but to also develop effective treatment plans and identify needed supports for the individual (Milne & McDonald, 2015).

This study found that the ABAS-II (Harrison & Oakland, 2003) is a reliable and valid adaptive functioning measure in a sample of adults with ID residing in a development center. Moderate to high test-retest and inter-rater reliability, as well as small differences between scores, were demonstrated for the ABAS-II by significant correlations and small effect sizes for GAC and domain scores over a 2-week time interval and with two different raters. Concurrent validity with the VABS-II was demonstrated by significant, weak to moderate correlations between GAC and domain scores. While these correlation coefficients were weaker than the test-retest and inter-rater reliability coefficients, they were similar to previously reported concurrent validity correlation coefficients (Harrison & Oakland, 2003; Sparrow et al., 2005). Additionally, expectedly lower, significant correlation coefficients were found when investigating concurrent validity of the ABAS-II with IQ scores measured by the WAIS-IV and the SB-V, which is consistent with previous research in which moderate correlations between adaptive skill scales and intelligence tests have been found (Burns, 2012).

In sum, reliability and validity of the ABAS-II were demonstrated and the magnitude of the correlation coefficients were similar to previous ABAS-II reliability and validity studies (see Table 3). Additionally, while previous literature has demonstrated similar findings when investigating the psychometric properties of adaptive functioning measures in children and young adults (Bruininks, Woodcock, Weatherman, & Hill, 1996; Hamilton, Burns, & Neale, 2005; Harrison & Oakland, 2003; Kenworthy, Case, Harms, Martin, & Wallace, 2010; Lopata et al., 2012; Oakland, & Algina, 2011; Reynolds & Kamphaus, 2002; Sparrow et al., 2005; WPPSI-III; Wechsler, 2002; Wechsler, 2003; Wei, Oakland & Algina, 2008), the current study extends the literature by demonstrating similar findings in a sample of adults with ID.

Previous research has also suggested that comorbid psychiatric disorders and emotional/behavioral symptoms impact the adaptive functioning of individuals with ID differently (Di Nuovo & Buono, 2007; Lopata et al., 2012). Therefore, it seemed possible that individuals with emotional/behavioral difficulties may impact the reliability of an informant-rated instrument, such as the ABAS-II. While no difference in test-retest reliability was found between the sub-samples of those who scored above and below the clinical threshold for comorbid behavioral/emotional problems, statistically significant differences were found between the two groups' GAC scores and Practical domain inter-rater reliability coefficients. Surprisingly, though, it was the group who scored *below* the clinical threshold for emotional/behavioral problems that had lower inter-rater reliability for the GAC and Practical domain scores. Therefore, the presence of emotional/behavioral problems did not decrease the test-retest or inter-rater reliability of the ABAS-II.

Since emotional/behavioral problems did not affect the reliability of the ABAS-II, other possible influential factors were explored, such as how well and for how long the informant

reported they knew the individual they were rating. Staff rated how well they knew the individual for whom they served as an informant on a scale from 0 (“Not Well”) through 5 (“Very Well”), and scores ranged from 2 to 5, with an overall mean rating score of 4.6 ($SD = .79$); for individuals whose emotional/behavioral symptoms were below the clinical threshold, the staff rating was 4.42 ($SD = .89$), whereas staff rated their familiarity with clients who scored above the clinical threshold at 4.74 ($SD = .67$). This difference in familiarity rating differed significantly, $t(100) = -2.04$, $p < .01$; in other words, staff informants who rated participants scoring above the threshold for emotional/behavioral problems reportedly knew them better than the informants who rated participants scoring below the threshold. Staff also reported how long they knew the individual for whom they served as an informant, which ranged from one to 360 months (30 years), with a mean duration of 65.25 months ($SD = 72.41$), or 5.44 years. Although staff serving as informants for individuals who scored above the clinical threshold for emotional/behavioral problems knew the individuals longer ($M = 74.14$ months, or 6.18 years/ $SD = 73.96$ months) than those who served as informants for individuals who scored below this threshold ($M = 54.09$ months, or 4.51 years/ $SD = 69.60$ months), this was not statistically different, $t(100) = -1.40$, $p = .17$. Therefore, inter-rater reliability may be more impacted by the rater’s familiarity with the individual, rather than the duration of time known.

These findings have important clinical implications when incorporating informant-rated adaptive functioning measures in diagnostic evaluations and assessments for intervention planning purposes. First, the reliability of the ABAS-II was not influenced by the presence of emotional/behavioral problems in individuals. Since individuals with ID have an increased vulnerability to develop mental health problems (Cooper & Bailey, 2001; Deb, Thomas, & Bright, 2001; Emerson et al., 2001; Moss, 2001; Dekker et al., 2002; Einfeld et al., 2006;

Whitaker & Read, 2006; Cooper et al., 2007), it is encouraging that measures such as the ABAS-II still produce reliable results when utilized with this subpopulation. Furthermore, these results exemplify the importance for clinicians to select knowledgeable informants to complete informant-rating measures. At least in this sample, the informant's familiarity with the individual was more important than the duration of their contact; this, then should be considered when selecting an informant.

When interpreting results of this study, several cautions need to be made. First, while all available participants were recruited at the time of this study over a 9-month period of time, only 102 participants were involved. Though this size of a sample met statistical power requirements for detecting a medium effect size with an alpha of .05 in a correlational design (required $n = 85$), this sample size was not sufficient in regards to power for detecting a medium-sized difference between two different groups' correlation coefficients (required $n = 177$; Cohen, 1992). Therefore, the results need to be replicated with a larger sample to make more conclusive and generalizable statements. Nevertheless, previous studies that have examined the psychometric properties of adaptive functioning measures utilized with individuals with ID, including those found in the ABAS-II manual (Harrison & Oakland, 2003), have included sample sizes ranging from 19 to 284 participants (de Bildt, Sytema, Kraijer, Sparrow, & Minderaa, 2005; Hayes & Farnill, 2003; Kenworthy, Case, Harms, Martin, & Wallace, 2010; Milne & McDonald, 2015; Oakland & Algina, 2011; Sparrow, Cicchetti, & Balla, 2005; Walsh & Shenouda, 1999). Thus, the sample size of the current study falls in the middle of these previously published sample sizes. Additionally, results of this study are limited to a specific sample of adults with ID residing in a developmental center, and are therefore not necessarily generalizable to all individuals with ID.

Additionally, since this study was initiated, the ABAS-3 was published (Harrison & Oakland, 2015). The main components of the ABAS-3 revision include new, nationally representative standardization samples, updated forms, and new administration and scoring options. Test authors, doctoral-level test developers, and clinical experts developed an average of 220 new and revised items for each of the five forms of the ABAS-3. After these research forms were administered to the standardization samples, items with the best psychometric properties (e.g., internal consistency) were retained for the published ABAS-3 forms. For the ABAS-3 Adult Form Rated by Others, 52 new items were added to replace outdated items, 40 items were revised for clarity, and 147 items were unchanged. The total item count (239) for the ABAS-3 Adult Form Rated by Others is the same as the ABAS-2 version, with 78% of the ABAS-3 form composed of original and revised ABAS-II items.

Additionally, the ABAS-3 manual reports the level of equivalence when comparing scores of the ABAS-II and the ABAS-3 (Harrison & Oakland, 2015). This study was conducted with a non-clinical adult sample ($n = 37$) for the Adult Form, Self-Report and the Adult Form, Rated by Others. Due to the high degree of similarity in item content between the two editions of the ABAS, strong, corrected Pearson correlation coefficients were found for this limited sample for the Adult Form, Self-Report domain scores (Conceptual, $r = 0.89$; Social, $r = 0.92$; Practical, $r = 0.88$) and GAC scores ($r = 0.90$), as well as for the Adult Form, Rated by Others domain scores (Conceptual, $r = 0.91$; Social, $r = 0.85$; Practical, $r = 0.89$) and GAC scores ($r = 0.90$). Additionally, the average effect size of the difference between the ABAS-II and ABAS-3 scores was .16, therefore, demonstrating strong equivalence between the two versions. Due to the high degree of similarity that was demonstrated between the ABAS-II and the ABAS-3, the authors concluded that the validity psychometrics published with the ABAS-II still apply to the ABAS-3

(Harrison & Oakland, 2015). The current findings in this study can therefore cautiously be generalized to the ABAS-3, and ultimately provide preliminary results from which future studies investigating the psychometric properties of the ABAS-3 in similar populations can be compared.

References

- Adams, G. L. (1999). *Comprehensive Test of Adaptive Behavior-Revised*. Seattle, WA: Educational Achievement Systems.
- American Association on Intellectual and Developmental Disability (AAIDD). (2010). *Intellectual Disability: Definition, classification, and systems of support* (11th ed.) Washington, DC: American Association on Intellectual and Developmental Disability.
- American Association on Mental Retardation (AAMR). (1992). *Mental retardation: Definition, classification, and systems of support*. Washington, DC: American Association on Mental Retardation.
- American Association on Mental Retardation (AAMR). (2002). *Mental retardation: Definition, classification, and systems of support*. Washington, DC: American Association on Mental Retardation.
- American Psychiatric Association (APA). (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.) Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (APA). (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed. text rev.). Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (APA). (1994). *Diagnostic and statistical manual of mental disorders* (4th ed. text rev.) Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (APA). (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. text rev.). Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, D.C.: American Psychiatric Publishing.

- Atkinson, L. (1990). Intellectual and adaptive functioning: Some tables for interpreting the Vineland in combination with intelligence tests. *American Journal on Mental Retardation*, 95(2), 198-203.
- Balboni, G., Pedrabissi, L., Molteni, M., & Villa, S. (2001). Discriminant validity of the Vineland Scales: Score profiles of individuals with mental retardation and a specific disorder. *American Journal on Mental Retardation*, 106(2), 162-172. doi:10.1352/0895-8017(2001)106<0162:DVOTVS>2.0.CO;2
- Beail, N. (2003). Utility of the Vineland Adaptive Behavior Scales in diagnosis and research with adults who have mental retardation. *Mental Retardation*, 41(4), 286-289. doi:10.1352/0047-6765(2003)41<286:UOTVAB>2.0.CO;2
- Bruininks, R. H., Woodcock, R. W., Weatherman, R. F., & Hill, B. K. (1996). *Scales of Independent Behavior – Revised*. Rolling Meadows, IL: Riverside Publishing.
- Buckles, J., Luckasson, R., & Keefe, E. (2013). A systematic review of the prevalence of psychiatric disorders in adults with intellectual disability, 2003-2010. *Journal of Mental Health Research in Intellectual Disabilities*, 6, 181-207. doi:10.1080/19315864.2011.651682
- Canivez, G. L. (2012). Review of the Wechsler Adult Intelligence Scale-Fourth Edition. *Mental Measurements Yearbook and Tests in Print* (18th ed.). Retrieved from <http://web.b.ebscohost.com.nocdbproxy.xavier.edu/ehost/detail/detail?vid=3&sid=42c4ef8c-730f-4aec-9a5d-d72a7a7133fe%40sessionmgr111&hid=109&bdata=JnNpdGU9ZWWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=test.3182&db=mmt>

- Chitty, D. J., Boo, S. S., & Jamieson, J. (1993). Prevalence of dual diagnosis in an institution for individuals who are developmentally handicapped. *Behavioral Residential Treatment*, 8, 55-66. doi:10.1002/bin.2360080107
- Cohen, R. J. & Swerdlik, M. E. (2013). *Psychological testing and assessment*. New York, NY: McGraw-Hill Higher Education.
- Cooper, S. A., & Bailey, N. (2001). Psychiatric disorders amongst adults with learning disabilities – prevalence and relationship to ability level. *Irish Journal of Psychological Medicine*, 18, 45-53.
- Cooper, S. A., Smiley, E., Morrison, J., Williamson, A., & Allen, L. (2007). Mental ill-health in adults with intellectual disabilities: Prevalence and associated factors. *British Journal of Psychiatry*, 190, 27-35. doi: 10.1192/bjp.bp.106.022483
- de Bildt, A., Sytema, S., Kraijer, D., Sparrow, S., & Minderaa, R. (2005). Adaptive functioning and behaviour problems in relation to level of education in children and adolescents with intellectual disability. *Journal of Intellectual Disability Research*, 49(9), 672-681. doi:10.1111/j.1365-2788.2005.00711.x
- Deb, S., Thomas, M., & Bright, C. (2001). Mental disorder in adults with intellectual disability: Prevalence of functional psychiatric illness among a community-based population aged between 16 and 64 years. *Journal of Intellectual Disability Research*, 45, 495-505. doi:10.1046/j.1365-2788.2001.00374.x
- Dekker, M. C., Koot, H. M., van der Ende, J., & Verhulst, F. C. (2002). Emotional and behavioral problems in children and adolescents with and without intellectual disability. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 43, 1087-1098. doi:10.1023/A:1021263216093

- Einfeld, S., L., Piccinin, A. M., Mackinnon, A., Hofer, S. M., Taffe, J., & Gray, K. M. et al. (2006). Psychopathology in young people with intellectual disability. *The Journal of the American Medical Association*, 296, 1981-1989. doi:10.1001/jama.296.16.1981
- Emerson, E., Kiernan, C., Alborz, A., Reeves, D., Mason, H., Swarbrick, R. et al. (2001). The prevalence of challenging behaviors: A total population study. *Research in Developmental Disabilities*, 22, 77-93. doi:10.1016/S0891-4222(00)00061-5
- Gleason, K., & Coster, W. (2012). An ICF-CY-based content analysis of the Vineland Adaptive Behavior Scales-II. *Journal of Intellectual & Developmental Disability*, 37(4), 285-293. doi:10.3109/13668250.2012.720675
- Hamilton, W. G., Burns, T. G., & Neale, K. M. (2005). Correlational analysis of the Vineland adaptive behavior scales and the ABAS-II in children with epilepsy. *Archives of Clinical Neuropsychology*, 20, 827.
- Harrison, P. L., & Oakland, T. (2003). *Adaptive Behavior Assessment System- Second Edition*. San Antonio, TX: The Psychological Corporation.
- Harrison, P., & Oakland, T. (2015). *Adaptive Behavior Assessment System- Third Edition*. Torrance, CA: Western Psychological Services.
- Hayes, S., & Farnill, D. (2003). Correlations for the Vineland Adaptive Behavior Scales with Kaufman Brief Intelligence Test in a forensic sample. *Psychological Reports*, 92, 573-580. doi: 10.2466/PRO.92.2.573-580
- Kenworthy, L., Case, L., Harms, M. B., Martin, A., & Wallace, G. L. (2010). Adaptive behavior ratings correlate with symptomatology and IQ among individuals with high-functioning autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 40, 416-423. doi:10.1007/s10803-009-0911-4

- Kerker, B. D., Owens, P. L., Zigler, P. I., & Horwitz, S. M. (2004). Mental health disorders among individuals with mental retardation: Challenges to accurate prevalence estimates. *Public Health Reports, 119*, 409-417.
- Kishore, M. T., Nizamie, S. H., & Nizamie, A. (2010). Utility of Reiss Screen in identifying psychiatric problems in persons with mental retardation. *Indian Journal of Psychological Medicine, 32*, 38-41.
- Koriakin, T. A., McCurdy, M. D., Papazoglou, A., Pritchard, A. E., Zabel, T. A., Mahone, E. M., & Jacobson, L. A. (2013). Classification of intellectual disability using the Wechsler Intelligence Scale for Children: Full Scale IQ or General Abilities Index?. *Developmental Medicine & Child Neurology, 55*(9), 840-845. doi:10.1111/dmcn.12201
- Lindblad, I., Svensson, L., Landgren, M., Nasic, S., Tideman, E., Gillberg, C., & Fernell, E. (2013). Mild intellectual disability and ADHD: A comparative study of school age children's adaptive abilities. *Acta Paediatrica, 102*(10), 1027-1031. doi:10.1111/apa/12351
- Lopata, C., Fox, J. D., Thomeer, M. L., Smith, R. A., Volker, M. A., Kessel, C. M., McDonald, C. A., & Lee, G. K. (2012). ABAS-II ratings and correlates of adaptive behavior in children with HFASDs. *Journal of Developmental and Physical Disabilities, 24*(4), 391-402. doi:10.1007/s10882-012-9277-1
- Loveland, K., & Tunali-Kotoski, B. (1998) Development of adaptive behavior in persons with mental retardation. In J. A. Burack, R. M. Hodapp, & E. Zigler (Eds.) *Handbook of Mental Retardation and Development* (521-541). Cambridge, UK: Cambridge University Press.

Makary, A. T., Testa, R., Tonge, B.J., Einfeld, S. L., Mohr, C., & Gray, K. M. (2015).

Association between adaptive behaviour and age in adults with Down syndrome without dementia: Examining the range and severity of adaptive behaviour problems. *Journal of Intellectual Disability Research*, 59(8), 689-702. doi:10.1111/jir.12172

Mash, E., & Barkley, R. (2007). *Assessment of Childhood Disorders*, Fourth Edition. New York, NY: The Guilford Press.

Matson, J. L., Belva, B. C., Hattier, M. A., Matson, M. L. (2011). Scaling methods to measure psychopathology in persons with intellectual disabilities. *Research in Developmental Disabilities*, 33, 549-562. doi: 10.1016/j.ridd.2011.10.023

Milne, S., & McDonald, J. (2015). Assessing adaptive functioning in preschoolers referred for diagnosis of developmental disabilities. *Infants & Young Children*, 28(3), 248-261. doi:10.1097/IYC.0000000000000037

Milne, S., McDonald, J., & Comino, E. (2012). Adaptive function in preschoolers in relation to developmental delay and diagnosis of autism spectrum disorders: Insights from a clinical sample. *Autism*, 17(6), 743-753. doi:10.1177/1362361312453091

Moss, S. (2001). Psychiatric disorders in adults with mental retardation. *International Review of Research in Mental Retardation*, 24, 211-243. doi: 10.1016/S0074-7750(01)80010-0

Oakland, T., & Algina, J. (2011). Adaptive Behavior Assessment System-II Parent/Primary Caregiver Form: Ages 0-5: Its factor structure and other implications for practice. *Journal of Applied School Psychology*, 27, 103-117. doi:10.1080/15377903.2011.565267

Papazoglou, A., Jacobson, L. A., & Zabel, T. A. (2013). Sensitivity of the BASC-2 adaptive skills composite in detecting adaptive impairment in a clinically referred sample of

children and adolescents. *The Clinical Neuropsychologist*, 27(3), 386-395.

doi:10.1080/13854046.2012.760651

Papazoglou, A., Jacobson, L. A., & Zabel, T. A. (2013). More than intelligence: Distinct cognitive/behavioral clusters linked to adaptive dysfunction in children. *Journal of the International Neuropsychological Society*, 19(2), 189-197.

doi:10.1017/S1355617712001191

Pogge, D. L., Stokes, J., Buccolo, M. L., Pappalardo, S., & Harvey, P. D. (2014). Discovery of previously undetected intellectual disability by psychological assessment: A study of consecutively referred child and adolescent psychiatric inpatients. *Research in Developmental Disabilities*, 35(7), 1705-1710. doi:10.1016/j.ridd.2014.03.012

Reiss, S. (2009). Test manual for the Reiss Screen for Maladaptive Behavior (2nd ed.).

Worthington, OH: IDS.

Reynolds, C. R., & Kamphaus, R. W. (2002). *Behavior Assessment System for Children (BASC)*.

New York: Guilford.

Roid, G. H. (2003). *Stanford Binet Intelligence Scales, Fifth Edition*. Rolling Meadows, IL: Riverside Publishing.

Schraw, G. (2012). Review of the Wechsler Adult Intelligence Scale-Fourth Edition. *Mental Measurements Yearbook and Tests in Print* (18th ed.). Retrieved from EBSCO Mental Measurements Yearbook database.

Soenen, S., Van Berckelaer, I., & Scholte, E. (2009). Patterns of intellectual, adaptive and behavioral functioning in individuals with mild mental retardation. *Research in Developmental Disabilities*, 30, 433-444. doi:10.1016/j.ridd.2008.04.003

- Sparrow, S., Cicchetti, D. V., & Balla, B. A. (2005). *Vineland Adaptive Behavior Scales* (2nd ed.). San Antonio, TX: Pearson.
- Summers, J., Boyd, K., & Morgan, J. (2004). Evaluating patients: With intellectual disabilities and comorbid mental health problems. *Psychiatric Annals*, 34(3), 215-220.
- Tomanik, S. S., Pearson, D. A., Loveland, K. A., Land, D. M., & Shaw, J. B. (2007). Improving the reliability of autism diagnosis examining the utility of adaptive behaviour. *Journal of Autism and Developmental Disorders*, 37(5), 921-928. doi:10.1007/s10803-0060227-6
- Walsh, K. K., & Shenouda, N. (1999). Correlations among the Reiss Screen, the Adaptive Behavior Scale Part II, and the Aberrant Behavior Checklist. *American Journal on Mental Retardation*, 104(3), 236-248.
doi:10.1352/08958017(1999)104<0236:CATRST>2.0.CO;2
- Wechsler, D. (2002). *Wechsler Preschool and Primary Scale of Intelligence- Third Edition*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (2003). *Wechsler Intelligence Scale for Children- Fourth Edition*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (2008). *Wechsler Adult Intelligence Scale- Fourth Edition*. San Antonio, TX: The Psychological Corporation.
- Wei, Y., Oakland, T., & Algina, J. (2008). Multigroup confirmatory factor analysis for the Adaptive Behavior Assessment System-II Parent Form, ages 5-21. *American Journal on Mental Retardation*, 113(3), 178-186. doi:10.1352/0895-8017(2008)113[178:MCFAFT]2.0.CO;2

Whitaker, S. & Read, S. (2006). The prevalence of psychiatric disorders among peoples with intellectual disabilities: An analysis of the literature. *Journal of Applied Research in Intellectual Disabilities*, 19, 330-345. doi:10.1111/j.1468-3148.2006.00293.x

Table 1

Frequencies and Percentages of Comorbid Psychiatric Disorders

Disorders	<i>N</i>	%
Disruptive, Impulse-Control, and Conduct Disorders	37	36%
Autism Spectrum Disorder	21	21%
Depressive Disorders	18	18%
Schizophrenia Spectrum and Other Psychotic Disorders	16	16%
Personality Disorders	8	8%
Feeding and Eating Disorders	7	7%
Neurocognitive Disorders	7	7%
Paraphilic Disorders	5	5%
Bipolar and Related Disorders	5	5%
Anxiety Disorders	4	4%
Stereotypic Movement Disorder	4	4%
Premenstrual Dysphoric Disorder	3	3%
Substance-Related and Addictive Disorders	3	3%
Other (including Childhood-Onset Fluency Disorder, Elimination Disorders, Language Disorder, Obsessive-Compulsive Disorder, Trauma- and Stressor-Related Disorders, Sleep-Wake Disorders)	7	7%

Note: More than 90% of residents at this facility were dually diagnosed with mental illness. Some residents had multiple comorbid psychiatric disorders. Percentage reflects the number of participants with the diagnosis out of the total number of participants ($n = 102$).

Table 2

Means and Standard Deviations of Measures for Total Sample

Measure	<i>M (SD)</i>
ABAS-II Primary/Time 1 (<i>n</i> = 102)	55.34 (16.13)
General Adaptive Composite	58.09 (12.28)
Conceptual	67.54 (15.67)
Social	56.83 (15.94)
Practical	
ABAS-II Primary/Time 2 (<i>n</i> = 95)	54.04 (15.63)
General Adaptive Composite	57.81 (12.23)
Conceptual	66.21 (14.47)
Social	55.85 (15.93)
Practical	
ABAS-II Secondary/Time 1 (<i>n</i> = 101)	54.75 (15.89)
General Adaptive Composite	59.09 (12.62)
Conceptual	67.80 (16.08)
Social	56.42 (16.68)
Practical	
VABS-2 Primary/Time 1 (<i>n</i> = 102)	
Adaptive Behavior Composite	28.75 (13.24)
Communication	27.81 (13.93)
Social	31.02 (14.85)
Practical	33.50 (15.15)
RSMB (N=102)	
Below Threshold Total Score (<i>n</i> = 45)	4.76 (2.61)
Above Threshold Total Score (<i>n</i> = 57)	12.74 (2.99)
WAIS-IV and SB-V IQ SCORE	
Chart Review (<i>n</i> = 32)	
Full Scale IQ	48.75 (5.81)

Note: ABAS-II = Adaptive Behavior Assessment System- Second Edition; VABS-2 = Vineland Adaptive Behavior Scale- Second Edition; RSMB = Reiss Screen for Maladaptive Behavior.

Table 3

ABAS-II Reliability and Validity Correlations of Past Studies and Current Study

	Author, Date	<i>n</i>	Participant Age	<i>r</i>	Current Study <i>r</i>
Test-retest	Harrison & Oakland, 2003	207	birth – 5 years	GAC = .88 CON = .86 SOC = .84 PRA = .86	GAC = .90 CON = .89 SOC = .85 PRA = .90
Inter-rater	Harrison & Oakland, 2003	52	16 - 89 years	GAC = .89 CON = .87 SOC = .87 PRA = .87	GAC = .82 CON = .81 SOC = .71 PRA = .77
Concurrent Validity with VABS-II	Harrison & Oakland, 2003	45	1 month – 5:9 years	GAC/ABC = .70 CON/COM = .61 SOC/SOC = .68 PRA/DLS = .49	GAC/ABC = .74 CON/COM = .64 SOC/SOCi = .62 PRA/DLS = .81
	Sparrow, Cicchetti, & Balla, 2005	55	17 – 74 years	GAC/ABC = .69 CON/COM = .77 SOC/SOC = .72 PRA/DLS = .57	GAC/ABC = .74 CON/COM = .64 SOC/SOCi = .62 PRA/DLS = .81
Concurrent Validity with IQ scores	Kenworthy et al., 2010	40	12 – 22 years	GAC/IQ = .31	GAC/IQ = .44

Note: *n* = sample size; *r* = correlation coefficient; GAC = ABAS-II General Adaptive Composite; CON = ABAS-II Conceptual domain; SOC = ABAS-II Social domain; PRA = ABAS-II Practical domain; ABC = VABS-II Adaptive Behavior Composite; COM = VABS-II Communication domain; SOCi = VABS-II Socialization domain; DLS = VABS-II Daily Living Skills domain.

Appendix

IRB Approval Letter

July 22, 2014

Rachel Holden
4011 Forest Ave.
Cincinnati, OH 45212

Dear Ms. Holden:

The IRB has completed the review of your protocol #14-003, *Psychometric Properties of the Adaptive Behavior Assessment System – Second Edition at a Midwestern Developmental Center* using expedited review procedures. We appreciate your thorough treatment of the issues raised and your timely response. Your study is approved in the Expedited category under Federal Regulation 45CFR46. Approval expires July 22, 2015. A progress report, available at <http://www.xavier.edu/irb/forms.cfm>, is due by that date.

If you wish to modify your study, including any changes to the approved Informed Consent form, it will be necessary to obtain IRB approval prior to implementing the modification. If any adverse events occur, please notify the IRB immediately.

We wish you success with your research!
Sincerely,

A handwritten signature in dark ink, reading "Morell E. Mullins, Jr." with a stylized "AD" at the end.

Morell E. Mullins, Jr., Ph.D.

Chair, Institutional Review Board
Xavier University

MEM/sb

Enclosure: stamped informed consent

IRB Approval Letter

July 16, 2015

Rachel Holden
4011 Forest Ave.
Cincinnati, OH 45212

Re: Protocol #14-003, *Psychometric Properties of the Adaptive Behavior Assessment System-Second Edition at a Midwestern Developmental Center*

Dear Ms. Holden:

The IRB has received your Progress Report for the above mentioned protocol and understand that you wish to extend your approval for another year. Therefore your above-referenced study has been re-approved in the Expedited category under Federal Guidelines 45CFR46. Your approval expires on July 16, 2016 and a progress Report is due by that date. The form can be found online at <http://www.xavier.edu/irb/forms.cfm>.

Please note that if you wish to modify your study, it will be necessary to obtain IRB approval prior to implementing the modification. If any adverse events occur, please notify the IRB immediately.

We truly appreciate your efforts and attention to compliance within the spirit of human subject's protection. We wish you great success with your research.

Sincerely,

A handwritten signature in dark ink, reading "Morell E. Mullins, Jr." with a stylized "AD" at the end.

Morell E. Mullins, Jr., Ph.D.
Chair, Institutional Review Board
Xavier University

MEM/sb

Human Rights Permission Letter



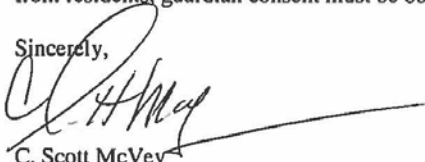
07/01/2014

Rachel Holden, M.A.
4011 Forest Ave
Cincinnati, OH 45212

Dear Rachel Holden:

I have reviewed your research proposal and grant permission for you to use SODC data for the purpose of your research, Psychometric Properties of the Adaptive Behavior Assessment System- Second Edition at a Midwestern Developmental Center. Additionally, I have reviewed your research proposal and grant permission for you to recruit employees and residents of SODC for the purpose of your research, Psychometric Properties of the Adaptive Behavior Assessment System- Second Edition at a Midwestern Developmental Center. When collecting data that requires direct communication and interpersonal contact from residents, guardian consent must be obtained.

Sincerely,



C. Scott McVey
Superintendent

4399 East Bauman Lane
Batavia, Ohio 45103-1685
The State of Ohio is an Equal Opportunity
Employer and Provider of Services

(513) 732-9200
(513) 735-8232 FAX
(513) 732-9222 TDD
<http://dodd.ohio.gov/residential/sodc.htm>

Summary

Title: Psychometric Properties of the ABAS-II with Adults Diagnosed with ID

Background: Historically, cognitive functioning has been the primary focus for diagnosis of Intellectual Disability (ID) both in diagnostic evaluations and research (de Bildt, Systema, Kraijer, Sparrow, & Minderaa, 2005). Although research has also focused on adaptive functioning, the importance of such research is emphasized after the fifth edition of the Diagnostic Statistical Manual was recently published (DSM-5; APA, 2013). Adaptive functioning is now the primary basis for determining severity levels when diagnosing ID. Therefore, thorough exploration of adaptive functioning itself and the psychometric properties of the instruments utilized to measure adaptive functioning is imperative to not only determine severity level of ID (APA, 2013), but to also develop effective treatment plans and identify needed supports for the individual (Milne & McDonald, 2015).

Method and Discussion: After receiving IRB approval from a university and institutional agency, participants were recruited from a Midwestern developmental center - 102 adults with ID (71 male/69.6%; 31 female/30.4%, mean age = 40.4 years, modal age = 27 years) and comorbid psychiatric diagnoses (see Table 1). With regards to ID severity level, 16 (15.7%) were diagnosed with Mild, 48 with Moderate (47.1%), 29 with Severe (28.4%), and 9 with Profound (8.8%). Direct care staff were identified to serve as primary and secondary informants for each participant. The primary informant was administered the ABAS-II Adult Form, Rated by Others and Vineland-II Survey/Interview form. The secondary informant also completed the ABAS-II. Two weeks later, the ABAS-II was completed again by the primary informant. Additionally, the most recent IQ scores measured by the WAIS-IV or SB-V were retrieved from the residents' clinical charts.

The ABAS-II (Harrison & Oakland, 2003) was found to be a reliable and valid adaptive functioning measure in this population. Strong test-retest and inter-rater reliability were demonstrated for the ABAS-II by significant correlations for GAC and domain scores over a 2-week time interval and with two different raters. Additionally, strong concurrent validity was demonstrated with the VABS-II by significant correlations between GAC and domain scores, and with IQ scores measured by the WAIS-IV and the SB-V. While previous literature has demonstrated similar findings in children and young adults (e.g., Hamilton, Burns, & Neale, 2005; Kenworthy, Case, Harms, Martin, & Wallace, 2010; Lopata et al., 2012), the current study extends the literature by demonstrating similar findings in a population of adults with ID.

Specific limitations of this study will be addressed, as well as implications for the recently released third edition of the ABAS-3 (Harrison & Oakland, 2015). The total item count, 239, for the ABAS-3 Adult Form Rated by Others is the same as the ABAS-II version, with 78% of the ABAS-3 form composed of original and revised ABAS-II items. While results of this study investigated the psychometric properties of the ABAS-II and cannot be applied directly to the new ABAS-3 revision, the findings provide useful psychometric data for the ABAS-II in a population not previously evaluated.