

The Construct of Adaptive Behavior: Its Conceptualization, Measurement, and Use in the Field of Intellectual Disability

Marc J. Tassé, Robert L. Schalock, Giulia Balboni, Hank Bersani, Jr., Sharon A. Borthwick-Duffy,
Scott Spreat, David Thissen, Keith F. Widaman, and Dalun Zhang

Abstract

This article updates the current conceptualization, measurement, and use of the adaptive behavior construct. Major sections of the article address an understanding of the construct, the current approaches to its measurement, four assessment issues and challenges related to the use of adaptive behavior information for the diagnosis of intellectual disability, and two future issues regarding the relations of adaptive behavior to multidimensional models of personal competence and the distribution of adaptive behavior scores. An understanding of the construct of adaptive behavior and its measurement is critical to clinicians and practitioners in the field because of its role in understanding the phenomenon of intellectual disability, diagnosing a person with intellectual disability, providing a framework for person-referenced education and habilitation goals, and focusing on an essential dimension of human functioning.

Key Words: *adaptive behavior assessment; adaptive behavior skills; adaptive behavior construct; diagnosis; intellectual disability*

The construct of adaptive behavior fulfills four essential functions in the field of intellectual disability (ID). First, significant limitations in adaptive behavior, along with significant limitations in intellectual functioning and age of onset prior to age 18, define ID operationally. Second, scores on measures of adaptive behavior are used to determine whether the person meets the second prong for a diagnosis of ID: significant limitations in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. Third, the construct of adaptive behavior provides a framework both for charting the development of adaptive skills and establishing education and rehabilitation goals. Fourth, adaptive behavior encompasses an essential dimension in a multidimensional understanding of human functioning.

Despite fulfilling these four functions, the conceptualization and measurement of the adaptive behavior construct are still emerging. To

further our understanding and application of the construct, this article has the following four purposes: (a) to describe our understanding of the current construct of adaptive behavior, (b) to summarize the current approaches to its measurement, (c) to discuss four assessment issues related to diagnosis, and (d) to introduce the reader to two future issues that the field needs to address. These two future issues are the relation of the adaptive behavior construct to multidimensional models of personal competence and the measurement-based distribution of adaptive behavior scores.

Terminology is important as we continue to study and understand the construct of adaptive behavior. Thus, throughout the article, a *construct* is defined as an abstract or general idea based on observed phenomena and formed by arranging parts or elements. *Adaptive behavior* is defined as the collection of conceptual, social, and practical

skills that have been learned and are performed by people in their everyday lives (Schalock et al., 2010).

The Construct of Adaptive Behavior

Before the advent of intelligence tests around 1900, ID was described in terms related to what we now call *adaptive behavior*. As discussed in Greenspan and Granfield (1992), Nihira (1999), and Scheerenberger (1983), terms used to denote ID included *social competency*, *social norms*, the *power of fending for one's life*, *adaptability to the environment*, *coping with the demands of everyday life*, and *social adjustment*. It was in 1959 that Heber first introduced concepts of *maturation*, *learning*, and *social adjustment* into the diagnostic criteria of ID. A couple of years later, Heber (1961) revised the American Association on Mental Deficiency's (now the American Association on Intellectual and Developmental Disabilities [AAIDD]) definition of 1959 and folded *maturation*, *learning*, and *social adjustment* into the single, largely undefined construct of *adaptive behavior*.

Heber's (1959, 1961) conceptualization and inclusion of adaptive behavior in the operational definition of ID created the need to develop tests to measure the construct. At the time of Heber (1959, 1961), the only test available was the Vineland Social Maturity Scale (VSMS) published in 1936 by Edgar Doll (see Doll, 1936). The VSMS was not, strictly speaking, a measure of adaptive behavior. Thus, the addition of adaptive behavior as a diagnostic criterion led to a proliferation of test development activities in this area during the 1960s and beyond (Nihira, 1999). Chief among these activities was the funding of the first research project to develop a test to measure adaptive behavior. This project was jointly sponsored by the National Institute of Mental Health, the American Association on Mental Deficiency (now AAIDD), and Parsons State Hospital and Training Center in Kansas. The project was awarded to Nihira and his colleagues and culminated in the publication of the first standardized assessment instrument of adaptive behavior, the Adaptive Behavior Checklist (Nihira, Foster, Shellhaas, & Leland, 1968). The Adaptive Behavior Checklist was subsequently revised twice within a span of approximately 86 years (see Nihira, Foster, Shellhaas, & Leland, 1969, 1974) and eventually became better known under its new name, the AAMD Adaptive Behavior Scale.

A secondary objective of the work by Nihira and his colleagues was to use prescriptive assessment information to establish habilitation training goals and programs. It is important to remember that during the 1970s, the assessment and training of adaptive behavior was integral to the principles of normalization. The 1980s saw the development of a plethora of adaptive behavior instruments, the use of adaptive behavior data in litigation cases regarding least restrictive environments, and considerable research on the factor structure of the domain of adaptive behavior (Nihira, 1999).

Defining adaptive behavior and determining its factor structure challenged researchers from the 1960s onward. In reference to its definition, a group of researchers (e.g., Bruininks, Thurlow, & Gilmore, 1987; Coulter & Morrow, 1978; Harrison, 1987; Kamphaus, 1987) identified six common elements across the then available definitions of adaptive behavior. These common elements were (a) the learning and performance of skills needed to successfully meet society's expectations; (b) an individual's display of behaviors expected from someone of his or her age and culture; (c) a person's individual functioning in regard to physical needs and community participation; (d) an individual's ability to maintain responsible social relationships; (e) the developmental nature of adaptive behavior, including increasing complexity with age; and (f) adaptive behavior reflected in an individual's typical, everyday behavior rather than reflective of a person's maximum performance, which is considered the case with the assessment of intellectual functioning.

On the basis of this early work, several studies examined the factor structure of existing adaptive behavior scales (see Harrison, 1987; McGrew & Bruininks, 1990; Meyers, Nihira, & Zetlin, 1979; Widaman, Borthwick-Duffy, & Little, 1991; Widaman, Gibbs, & Geary, 1987; Widaman & McGrew, 1996). These studies reported factor solutions that varied depending on whether the factor analyses were performed at the item, parcel (small grouping of 3–5 items), or domain level. Factor analyses performed at the item and parcel level have consistently reported a multifactorial solution. As summarized in Schalock (1999); Thompson, McGrew, and Bruininks (1999); and Widaman and McGrew (1996), the following four factors have consistently emerged from the extensive factor analytic work conducted prior to 1999: (a) motor or physical competence, which

involves gross and fine motor skills, ambulating, basic eating, and toileting skills (with the exception of the Widaman et al., 1987, study of the Client Development Evaluation Report, the motor domain factor does not appear to hold in older children and adults); (b) conceptual skills, which involve receptive and expressive language, reading and writing skills, and handling money; (c) social skills, which involve friendships, interactions with others, social participation, social reasoning, comprehension, and reasoning; and (d) practical skills, which involve household chores, dressing, bathing, preparing food, and washing dishes. The first factor, motor or physical competence, appears to be more developmental in nature and may level off as the child ages into middle childhood (e.g., age 8 or 9 years old) and may be more discriminating of physical limitations than intellectual disability. The three remaining factors consistently yielded from factor analytic work across numerous adaptive behavior instruments and years is quite strikingly consistent with Heber's (1959) original conceptualization of maturation (practical), learning (conceptual), and socialization (social).

The factor structure of adaptive behavior (i.e., practical, conceptual, and social skills) reported above documents a consistent three-factor solution dating back from 1959 through current factor analytic work. This three-factor solution of adaptive behavior was incorporated into the two most recent editions of the AAIDD terminology and classification manual (Luckasson et al., 2002; Schalock et al., 2010) and were operationally defined as follows:

1. *Practical skills*: activities of daily living (personal care), occupational skills, use of money, safety, health care, travel/transportation, schedules/routines, and use of the telephone.
2. *Conceptual skills*: language, reading and writing, and money, time, and number concepts.
3. *Social skills*: interpersonal skills, social responsibility, self-esteem, gullibility, naïveté (i.e., wariness), follows rules/obeys laws, avoids being victimized, and social problem solving.

Measurement of Adaptive Behavior

Once the factor structure of adaptive behavior was identified and standardized, cutoff scores obtained from standardized adaptive behavior instruments could be used to determine whether a person met the second criterion of ID: significant limitations in adaptive behavior as expressed in

conceptual, social, and practical adaptive skills (Schalock et al., 2010). In both the 2002 and 2010 AAMR/AAIDD manuals, significant limitations in adaptive behavior were operationally defined as “performance that is approximately two standard deviations below the mean of either (a) one of the following three types of adaptive behavior: conceptual, social, or practical or (b) an overall score on a standardized measure of conceptual, social, and practical skills” (Luckasson et al., 2002, p. 76; Schalock et al., 2010, p. 43). Additionally, the 2010 manual stressed the importance of considering the instrument's standard error of measurement when interpreting the individual's obtained adaptive behavior score.

Various groups in addition to AAIDD have recommended the use of standardized measures of adaptive behavior to assess the second prong of the definition of ID. For example, in 1996, Division 33 of the American Psychological Association recommended the use of a comprehensive, individual measure of adaptive behavior to allow objective assessment of significant limitations in adaptive behavior in comparison to the general population (Barclay et al., 1996). Similarly, the Social Security Administration's commissioned *Manual on the Determination of Intellectual Disability* also made a strong recommendation for the use of standardized adaptive behavior scales to assess the second prong of the definition of intellectual disability related to significant limitations in adaptive behavior (Reschly, Myers, & Hartel, 2002). Finally, the definition of intellectual disability proposed by the American Psychiatric Association's DSM-5 Subcommittee on ID proposed that “adaptive behavior is measured using individualized, standardized, culturally appropriate, psychometrically sound tests” (available at <http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=384>).

Currently, four comprehensive individualized, standardized, and psychometrically sound adaptive behavior scales are available that have been normed on a representative U.S. sample of the general population and have been developed specifically for the purpose of ruling in or out a diagnosis of ID.

Adaptive Behavior Scale—School, Second Edition (ABS-S:2)

The ABS-S:2 is a revision of the original AAMD Adaptive Behavior Scale (Lambert, Nihira, & Leland, 1993). The ABS-S:2 was developed for

use with individuals between the ages of 3 and 21 years. It is composed of two sections, subsuming adaptive behavior and problem behavior. The adaptive behavior section includes 67 items that assess adaptive skills across nine areas and provides standardized scores for these skill areas that have a mean of 10 and standard deviation of 3. In addition to the nine skills areas, the ABS-S:2 also provides aggregated scores for three adaptive behavior domains: personal self-sufficiency, personal-social responsibility, and community self-sufficiency. The ABS-S:2 manual provides two sets of standardization tables for scoring: One set of tables is based exclusively on individuals with ID; the second set is based on scores from a representative sample of the general population. The ABS-S:2 reports adequate reliability and validity (Harrington, 1998).

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

The ABAS-II is a revision of the ABAS, first published in 2000 (Harrison & Oakland, 2003). The ABAS-II is actually the same instrument as the original version, except that the scoring metric is aligned with the three adaptive domains (conceptual, social, and practical) introduced in the 2002 AAIDD manual (Luckasson et al., 2002). The ABAS-II provides an individualized measure of adaptive behavior for individuals from birth to 89 years old. A total of five ABAS-II forms have been developed: parent/caregiver forms for children ages 0–5 years and 5–21 years; teacher forms for children ages 2–5 years and 5–21 years; and an adult form for individuals assessed who are 16–89 years of age. The adult form can be completed by another respondent, such as a parent, or can be completed as a self-report form by individuals themselves.

Each of the ABAS-II scales provides standard scores ($M = 100$, $SD = 15$) for a full-scale score (general adaptive composite), three domain scores (conceptual, social, and practical), and scores on 9 or 10 skills areas (10, if employment skills are scored). The ABAS-II reports good psychometric properties (Burns, 2005).

The ABAS-II has two distinctive differences with the other three adaptive behavior scales presented here: (a) The ABAS-II is currently the only standardized adaptive behavior scale that allows self-report, and (b) the ABAS-II is the only instrument that provides standardized scores according to both the 10 adaptive skills areas

defined by the *Diagnostic and Statistical Manual* (4th ed., text rev.; American Psychiatric Association, 2000): communication, community use, functional academics, home-living, health and safety, leisure, self-care, self-direction, social, and work; and the three adaptive behavior domains (conceptual, practical, and social skills) defined in the 11th edition of the AAIDD terminology and classification manual (Schalock et al., 2010). It should be noted that the ABAS-II self-report has many advantages when using the adaptive behavior information for the purposes of programming and intervention planning, but self-report data should be used very cautiously, if at all, when the purpose is to rule in or out a diagnosis of ID (see Schalock et al., 2010; Tassé, 2009).

Scales of Independent Behavior— Revised (SIB-R)

The SIB-R (Bruininks, Woodcock, Weatherman, & Hill, 1996) is a revision of an earlier version of the SIB (Bruininks et al., 1984). The SIB-R is a comprehensive adaptive behavior scale that was standardized on a representative sample of individuals from the general population. It was developed for use with individuals from 3 months to 80-plus years old and consists of three separate forms: Early Development (3 months–8 years old), Comprehensive Form (3 months–80 years old), and Short Form. The Developmental Form and Short Form are a different subset of 40 items drawn from the SIB-R Comprehensive Form. The SIB-R may be administered via a structured interview or a checklist procedure in which the respondent completes the questionnaire directly.

The SIB-R Comprehensive Form contains two sections: adaptive behavior items and problem behavior items. The adaptive behavior section yields standard scores for the Broad Independence (Full-Scale) Score and four domain scores: motor skills, social interaction and communication skills, personal living skills, and community living skills. Although the reliability and validity for the comprehensive form are adequate, the psychometric properties of the Short Form and Developmental Form are questionable (Maccow, 2001).

Vineland Adaptive Behavior Scales— Second Edition (Vineland II)

The Vineland Social Maturity Scale was published by Doll in 1936 and then revised by Sparrow,

Balla, and Cicchetti in 1984 as the Vineland Adaptive Behavior Scales. The Vineland II was developed to assess adaptive behavior in individuals from 0 through 90 years old (Sparrow, Cicchetti, & Balla, 2005). It is available in four different forms: Parent/Caregiver Rating Form (0–90 years old), Teacher Form (3–18 years old), Survey Form (0–90 years old), and Expanded Interview Form (0–90 years old). The structure of the Vineland II provides standard scores with a mean of 100 and standard deviation of 15 for each of the four domains: motor skills (under 7 years old and over 50 years old), daily living skills, communication skills, and socialization. The Vineland II has extensive representative normative data. It also has strong psychometric properties (Widaman, 2010).

In summary, these four adaptive behavior instruments are based on the measurement of specific adaptive skills that reflect a multidimensional conceptual and measurement model of adaptive behavior. This model generally includes conceptual, social, and practical adaptive behavior domains. Generally speaking, any of these four instruments would be an adequate choice to use in assessing an individual's adaptive behavior for the purpose of ruling in or out a diagnosis of ID.

Assessment Issues Related to Diagnosis

As discussed in the preceding sections, over the last 50-plus years, the concept of adaptive behavior has evolved from a single, largely undefined term to a measurable construct whose factor structure and measurement are increasingly understood to include conceptual, social, and practical skills that have been learned and are performed in the community by people in their everyday lives. Despite this increased understanding, the field is still grappling with how best to assess its multiple dimensions. We next discuss four major issues and challenges associated with the assessment of adaptive behavior for the purpose of diagnosing a person with ID.

Approach to Test Development

The four adaptive behavior assessment instruments discussed above were generally developed using a classical test theory model and designed to measure the global nature of adaptive behavior without regard to capturing those skill levels around the cutoff point for determining significant limitations in adaptive behavior. In distinction to

classical test theory, item response theory (IRT; Hambleton & Swaminathan, 1985) differs from traditional test theory with respect to providing a clear theoretical model tying individual differences in an underlying construct to the probability of item responses. Unlike classical test theory, where psychometric characteristics of a test are group-dependent, IRT postulates that item characteristics are specific to the item and considered invariant across groups (Lord, 1980). One of the greatest advantages of IRT is its ability to provide scores for different individuals on a common metric without necessitating the administration of the same number of items or even any of the same items, assuming these items are drawn from a common item bank.

Most important, IRT allows one to measure individual levels of performance reliably across the continuum of adaptive skills and ages, with special attention given to providing precise information around the cutoff point for determining significant limitations in adaptive behavior—one of the two essential components of a diagnosis of ID. This is the approach that AAIDD has taken in the development of the Diagnostic Adaptive Behavior Scale (Tassé et al., 2011).

Reliability of Respondents

Adaptive behavior scales are typically completed either directly or via an interview process, with information provided by multiple respondents. The persons interviewed should know the person being assessed well and have had the opportunity to directly observe the person engaging in his or her typical behavior across contexts (e.g., home, community, school, and work). Generally, a parent, family member, colleague, or close friend is the most likely person to have had these opportunities and thus is the best respondent.

Assessing the reliability of respondents is best done by obtaining corroborating information from multiple respondents and sources of information (e.g., school records, previous evaluations, work history, social history). Establishing good rapport prior to conducting an adaptive behavior assessment and using multiple respondents and sources of information are critical elements for ensuring the reliability of the adaptive behavior information obtained (Harrison & Oakland, 2003). Conducting the adaptive behavior assessment via an interview (as opposed to having the respondent complete the scale directly) also

provides valuable clinical information that assists one in determining the reliability of the respondent, because the interview provides an opportunity to observe the respondent's cadence, response consistency, and thought given before responding to items.

Self-Report Versus Third-party Respondents

The third assessment issue relates to the reliability of self-report versus third-party respondents. This issue is especially salient when the respondent could have a potential stake in the outcome of the assessment (Reschly et al., 2002; Tassé, 2009). As discussed by Sparrow and colleagues (2005), one must consider the intended use of the assessment results when selecting the method of administration (interview vs. checklist) and the choice of respondent(s). Obtaining input from the individuals themselves may very well be critical for some purposes but not as a basis for a diagnosis of ID. This qualification is important because individuals may have a tendency to overestimate their competence and adaptive skills in an effort to appear more capable than they may actually be (Edgerton, 1967, 1990; Finlay & Lyons, 2002; Greenspan & Switzky, 2006).

The only currently available standardized adaptive behavior instrument that permits self-report is the ABAS-II. However, Harrison and Oakland (2003) state clearly that they do not recommend relying on self-report for the purposes of ruling in or out a diagnosis of ID, and virtually all experts in the assessment of adaptive behaviors agree with this position. Hence, we strongly recommend that when making a determination of ID, the assessment of a person's adaptive behavior be conducted in a thoughtful manner and incorporate multiple third-party respondents and multiple sources of information. In reference to third-party respondents, the following standard applies: The persons interviewed should know the target person well and should have observed the person's typical behavior over time in multiple contexts, such as the home, school, work, and the community.

Challenges Within the Forensic Context

Many challenges in the assessment of adaptive behavior arise that are specific to the forensic context, especially in regard to assessing the adaptive behavior of a person who is currently

incarcerated (Tassé, 2009). Chief among these challenges are the following:

1. A "retrospective diagnosis" is frequently required because ID has to be manifest before age 18, and thus the diagnosis has to be "retrospective" if the person is over 18 years of age.
2. If the person is incarcerated, it is difficult to assess present adaptive behavior functioning as it occurs in the community, and thus, in order to complete the adaptive behavior assessment one must often rely on respondents who are asked to retrospectively to a time prior to the target person's incarceration when supplying information on the person's adaptive behavior.
3. None of the existing adaptive behavior scales has been standardized or normed using a retrospective administration methodology.
4. The respondent's ability to recall adaptive behavior accurately may deteriorate rapidly as the time interval for the retrospective assessment increases.

The concept of *retrospective diagnosis* has been garnering more attention, especially in capital cases involving a determination of mental retardation. The heightened interest in retrospective diagnosis led the AAIDD to discuss its relevance to ID diagnosis in its 2007 *User's Guide* (see Schalock et al., 2007) and to expand more fully on the concept in the 11th edition of the AAIDD manual (Schalock et al., 2010). A retrospective diagnosis is necessary when a diagnosis of ID is made later in a person's life (i.e., after the target person reaches age 18 years), where the individual has not received an official diagnosis of ID during the developmental period. For such a diagnosis, the clinician must use multiple sources of information, including any data that can be obtained (e.g., school records, work records) to develop as complete a picture of the person's history of adaptive competencies to determine manifestations of possible ID prior to age 18.

Conducting a retrospective assessment of a person's adaptive behavior is very challenging (Everington & Olley, 2008). As noted by Tassé (2009), there is no research available examining the reliability or error rate of adaptive behavior assessments obtained retrospectively. Despite these important cautions, Olley and Cox (2008) affirm the necessity of relying on the retrospective diagnosis in certain situations.

When adaptive behavior assessments are used and collated with records that are reviewed, the clinician needs to weigh the extent to which the assessments (a) used multiple informants and multiple contexts; (b) recognized that limitations in present functioning are considered within the context of community environments typical of

the individual's peers and culture; (c) measured important social behavioral skills, such as gullibility and naïveté; (d) used an adaptive behavior evaluation that included behaviors that are currently viewed as developmentally and socially relevant; and (e) recognized that adaptive behavior refers to typical and actual functioning and not to capacity or maximum functioning (Schalock et al., 2010, pp. 95–96).

We acknowledge the growing need for research at the intersection of ID determination and forensic science, especially in relation to the measurement of adaptive behavior of individuals living in prisons, because assessing the present adaptive functioning of these persons to meet societal demands in the community is a tremendous challenge. In the meantime, clinicians involved in retrospective diagnoses also must be familiar with the following best practice guidelines regarding the valid interpretation of assessment information: (a) that results should be based on properly selected and administered standardized tests; (b) that confidence intervals of scores should be incorporated into the assessment summary; (c) that corrections must be made in an obtained IQ score or reference made to the cutoff score (e.g., two standard deviations below the population mean) based on aging norms (i.e., the Flynn effect); (d) that the influence of practice effects on test results must be acknowledged; and (e) that the potential effect on test results attributable to faking good or bad are always present (Schalock et al., 2010).

In summary, these four assessment issues—the approach used to develop adaptive behavior assessment instruments, the reliability of respondents, the impact of self versus third-party respondents, and challenges within the forensic context—pose significant challenges to clinicians who use adaptive behavior assessment information for diagnostic purposes. Although we need to continue to address each of these challenges, clinicians also should be aware of the best practice guidelines that have emerged in the field for selecting adaptive instruments. According to these guidelines, clinicians should (a) select an instrument that is a comprehensive measure of conceptual, social, and practical adaptive skills and is applicable to the population in question; (b) rely only on instruments that are normed on the general population, including individuals with and without disabilities; (c) determine, based on the publisher's specifications and state and professional regulations, who should administer

the instrument and who are the preferred respondents; (d) determine that the selected instrument has acceptable reliability and validity for its intended purpose; and (e) determine whether scoring software has been “error trapped” to prevent the entering of impossible answers or to control for circumstances such as missing data that may yield errors (Schalock et al., 2010).

In addition to these best practices for selecting adaptive behavior assessment instruments, the four assessment issues discussed above also underscore the importance of professional responsibilities in the assessment of adaptive behavior for the purpose of diagnosing ID. As discussed more fully in Schalock and colleagues (2012), these responsibilities involve

1. using an individually administered instrument that yields a measure of conceptual, social, and practical adaptive skills or an overall score or measure of conceptual, social, and practical adaptive skills;
2. drawing on direct observation of adaptive behavior;
3. involving trained professional interviewers and respondents who understand the principles of adaptive behavior, use age peers who live in the community as the comparison group, know the individual being assessed very well, and have had the opportunity to observe the person on a daily or weekly basis across multiple environments;
4. using an adaptive behavior assessment instrument that has been normed within community environments on individuals who are of the same age grouping as the individual being evaluated; and
5. interpreting the person's adaptive behavior score(s) by considering a statistical confidence interval based on the standard error of measurement for the specific instrument used, the instruments' strengths and limitations, the potential influence of specific sensory, motor, or communication limitations, and the identification of factors that influence adaptive functioning and consequent scores, such as opportunities, environments typical of the individual's age peers, and sociocultural considerations.

Future Issues

Our understanding of the adaptive behavior construct has advanced significantly over the last four decades as a result of considerable research into its factor structure and measurement. With this increased understanding, we are in a better position to begin answering two critical issues about the future conceptualization, measurement, and use of the construct. First, what is the relation of the adaptive behavior construct to multidimensional models of personal competence? Second, how are adaptive behavior scores distributed statistically (e.g., normal distribution)?

Relation to Multidimensional Models of Personal Competence

A number of models of personal competence have emerged over the last 20 years that typically involve three adaptive behavior factors: conceptual, social, and practical. This work suggests that the concept of adaptive behavior might easily be incorporated into a more comprehensive, multidimensional model of personal competence. At least two outcomes might occur. The first would apply a multidimensional model of personal competence to a functional definition of disability, including ID. For example, Greenspan (1999, 2006) and Greenspan and Driscoll (1997) proposed a model within which the overall construct of personal competence includes four domains: physical competence; affective competence (i.e., temperament, character, and social intelligence); everyday competence (i.e., social intelligence, practical intelligence, and conceptual intelligence/IQ); and academic competence (i.e., conceptual intelligence and language). A slight modification of this model was proposed by Thompson and colleagues (1999) and Thompson and Wehmeyer (2008), who suggested four factors that are involved in personal competence: physical competence, conceptual intelligence, practical intelligence, and social intelligence.

A second potential scenario is closely related to the two personal competence models just described. This scenario would merge the constructs of adaptive behavior and intelligence into either a tripartite model of adaptive intelligence (Greenspan, 2006; Mathias & Nettelbeck, 1992) or a tripartite model of personal competence that involves conceptual, social, and practical skills (Schalock, 2006). Within the latter model, conceptual intelligence/IQ is considered the standardized measure of conceptual skills (Schalock, 1999).

Either of these two potential future scenarios will involve considerable discussion, will require extensive empirical work, and will force the field to rethink such questions as the following: What are intelligence and intellectual functioning? What are adaptive behavior and adaptive skills? What is intellectual disability? For example, if intelligence is “a very general mental capability that among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and *learn from experience*” (Arvey et al., 1994, p. B1, emphasis added), could a broader conceptualization of

intelligence incorporate that part of the current definition of adaptive behavior that includes “skills that *have been learned* and are performed by people in their everyday lives”? A related question is, What is the relevance and utility of distinguishing between maximum performance, as currently used in reference to the assessment of intellectual functioning, and typical performance, as currently used in reference to the assessment of adaptive behavior? The attractiveness of incorporating the concept of adaptive behavior into a tripartite model of personal competence is the potential to develop a new generation of standardized instruments that would identify socially relevant indicators and associated measures of conceptual, social, and practical skills that individuals perform in their everyday lives. Such measures would better reflect both the current socioecological model of disability and the sociocultural basis of adaptive behavior.

Distribution of Adaptive Behavior Scores

Some concern must be raised as to whether a psychometric definition of significant limitations is as applicable to adaptive behavior as it is to intelligence. Intelligence is widely understood to follow a roughly normal distribution. On the basis of known properties of the normal distribution, approximately 2.28% of the population falls below an IQ score that is two standard deviations below the population mean. In a sense, the operational definition of a significant deficit in intelligence is a score that is approximately in the bottom 2% of the general population. However, whether adaptive behavior scores in the general population always follow a normal distribution is an open question. Most members of the general population are able to score a perfect or near perfect score on any of the existing tests of adaptive behavior. At a common-sense level, most of us know people who are exceptionally intelligent, geniuses if you will, in the domain of intellectual ability or knowledge. But can we make similar distinctions in domains of adaptive behavior? Does anyone know a really “super toiletter”? Are there any geniuses (i.e., greater than two standard deviations above the population mean) in regard to washing one’s face? Adaptive behavior reflects skills demonstrated by the overwhelming majority of the general public. These skills can be arranged into a series of largely developmental tasks that are generally accomplished by the time most individuals enter adulthood. The likely shape of the

distribution of adaptive behavior scores for individuals would seem to approximate the left half of a normal distribution, because most people achieve full competence in adaptive behavior by adulthood, and therefore scores would exhibit a pronounced ceiling effect.

Implications of the probable nonnormality of adaptive behavior scores are readily discerned. If the distribution of adaptive behavior scores is not normal, then the percentile rankings derived from the properties of the normal curve do not apply. That is, a score that falls two standard deviations below the mean of the general population on adaptive behavior might cut off some percentage other than the bottom 2.28% of the population. Given the likelihood that absence of an adaptive behavior skill is a rarity among the general public, one might speculate that any score on an adaptive behavior measure that falls below the ceiling on the instrument indicates a deficit that is significant.

This threat of nonnormality seems less likely to have a significant impact among children, where one might expect some normal variability with respect to age of skill acquisition. We speculate that the acquisition of adaptive behavior skills might yield a normal distribution with respect to age of acquisition. For example, the skill of being able to tie one's shoes is typically acquired around age 5 or 6 years. Some children learn to tie their shoes by age 3 years, and others acquire the skill much later. If the acquisition of shoe tying follows a normal distribution with respect to age, one can calculate the mean and standard deviation for age of acquisition, and percentile rankings can be calculated. Alternately, a significant deficit in adaptive behavior can be expressed in terms of acquisition age. If an individual has not learned a skill by age X, and 98% of persons of age X have attained that skill, the person in question has a significant deficit.

A major potential implication from a practical perspective of nonnormality could potentially be the need to rely on assessment methods other than normative scoring to assess adaptive behavior. This would be a major shift in testing practices in the field of measurement as it relates to intellectual and developmental disabilities. An obvious alternative approach to assessing adaptive functioning might be criterion measurement, used to determine whether a person's mastery level of conceptual adaptive skills falls below an established cutoff representing significant deficits for that person's age group. These cutoff levels could

be age or age-group specific. Using age criteria as cutoffs might make perfect sense, but this would be a radical psychometric departure from the "norm" of the past 30 years.

Currently, adaptive behavior is defined and measured on the basis of the individual's typical present functioning. The person's performance is then compared with the norm of the general population that contains the individual's same-age peers. Then, the typical norming tables for adults on measures of adaptive behavior force raw scores that are not normally distributed into estimated standard scores that are approximately normally distributed (or standardized scores that are "as normal as possible") by, in essence, overestimating the importance of small raw-score deviations from the ceiling of raw scores. For example, a raw score at the ceiling for a scale may receive a standard score of 130 (or two standard deviations above the mean); a raw score 1 point below the ceiling may get a standard score of 115 (or one standard deviation above the mean); a raw score 2 points below the ceiling may get a standard score of 100 (or at the mean). Thus, near the ceiling of raw scores, each 1-point difference in raw scores translates into a one standard deviation difference (i.e., a 15-point difference) in standardized scores. But far below the ceiling of raw scores, each 1-point difference in raw scores translates into much smaller differences in standardized scores. In fact, far below the ceiling of raw scores, each 1-point difference in raw scores may translate into only a 1-point difference in standardized scores.

To our knowledge, no theoretical or empirical evaluations of adaptive behavior scores have considered whether the assumption of normality is appropriate for such scores. Instead, researchers have typically invoked the age-old assumption that true scores on an underlying dimension of adaptive functioning are normally distributed even in situations in which raw scores depart markedly from normality. A definite ceiling effect in a raw score distribution may arise because the items used to assess an underlying characteristic were not sufficiently sensitive to assessing superior levels on the dimension. But a definite ceiling effect in the raw score distribution may reflect the distinctly nonnormal distribution of the underlying trait in the population. If an underlying trait is not normally distributed in the population, one can still identify cutoff points that indicate the bottom 2.28%, the bottom 5%, or the bottom

10% of scores on the dimension, but this must be done using different approaches than specifying the number of standard deviation units below the mean that the score falls.

Conclusion

The intent of this article was to update the field with regard to the current conceptualization, measurement, and use of the adaptive behavior construct. Major sections of the article addressed our current understanding of the adaptive behavior construct, the current approaches to its measurement, four assessment issues related to the diagnosis of ID, and two future issues regarding the relationship of adaptive behavior to multidimensional models of personal competence and the distribution of adaptive behavior scores. Our understanding and use of the construct of adaptive behavior is critical to clinicians and practitioners in the field because of the four essential functions that adaptive behavior fulfills in regard to understanding the phenomenon of ID, diagnosing a person with ID, providing a framework for person-referenced education and rehabilitation goals, and focusing on an essential dimension of human functioning.

In the future, we anticipate that the construct of adaptive behavior will play a key role in the evolution of the construct of ID. As discussed by Brown (2007), Emerson, Fujiura, and Hatton (2007), Rapley (2004), Schalock (2011), and Switzky and Greenspan (2006), the construct of intellectual disability is evolving based on the need to address how intellectual disability fits within the general construct of disability, on the social construction of disability, and on whether elements of the ID construct are relevant internationally due to the cultural relativity of the basic notions of intellectual functioning and adaptive behavior. Clearly, a better understanding of the construct of adaptive behavior will be integral to this evolution and will require cross-cultural research and interdisciplinary research teams to validate the construct across cultural groups.

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Authors:

Marc J. Tassé (e-mail: marc.tasse@osumc.edu), Nisonger Center, The Ohio State University, 1581 Dodd Drive, Columbus, OH 43210, USA; **Robert L. Schalock**, Hastings College, Hastings, NE; **Giulia Balboni**, University of Pisa, Pisa, Italy; **Hank Bersani Jr.**, Western Oregon University, Monmouth; **Sharon A. Borthwick-Duffy**, University of California, Riverside; **Scott Spreat**, Woods Services, Langhore, PA; **David Thissen**, University of North Carolina, Chapel Hill; **Keith F. Widaman**, University of California, Davis; and **Dalun Zhang**, Texas A&M University.