

## The Relation Between Intellectual Functioning and Adaptive Behavior in the Diagnosis of Intellectual Disability

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### Abstract

Intellectual disability originates during the developmental period and is characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. In this article, we present a brief history of the diagnostic criteria of intellectual disability for both the DSM-5 and AAIDD. The article also (a) provides an update of the understanding of adaptive behavior, (b) dispels two thinking errors regarding mistaken temporal or causal link between intellectual functioning and adaptive behavior, (c) explains that there is a strong correlational, but no causative, relation between intellectual functioning and adaptive behavior, and (d) asserts that once a question of determining intellectual disability is raised, both intellectual functioning and adaptive behavior are assessed and considered jointly and weighed equally in the diagnosis of intellectual disability. We discuss the problems created by an inaccurate statement that appears in the DSM-5 regarding a causal link between deficits in intellectual functioning and adaptive behavior and propose an immediate revision to remove this erroneous and confounding statement.

**Key Words:** *intellectual disability; intellectual functioning; adaptive behavior; diagnosis; DSM-5; definitions of intellectual disability; mental retardation*

Although the term or name has changed over time, the definition of *intellectual disability* (ID) used over the past 50 years or more has been quite consistent. Specifically, an analysis of the U.S.-based definitions used since the 1950s shows that the three essential elements of ID—limitations in intellectual functioning, limitations in adaptive behavior, and early age of onset—have not changed substantially (Brown, 2007; Schalock, Luckasson, & Shogren, 2007). Although the three elements have not substantially changed, there have been minor changes in the phrasing of the definition that have occurred in successive manuals published by the American Association on Intellectual and Developmental Disabilities (AAIDD) and the American Psychiatric Association (APA) as science and knowledge in these areas have advanced.

In this article, we focus on two scientific advances related to the construct of adaptive behavior and how these advances require the equal consideration of intellectual functioning and adaptive behavior in the diagnosis of intellectual disability. One major advance is the empirical validation of the factor structure of adaptive

behavior showing that adaptive behavior as a whole is composed of conceptual, social, and practical adaptive skills; the second major advance is the progress made in the formal standardized assessment of adaptive behavior (Tassé et al., 2012).

The current definition of intellectual disability promulgated by AAIDD is that “intellectual disability is characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18” (Schalock et al., 2010, p. 1). Analogously, the *Diagnostic and Statistical Manual of Mental Disorders*, 5<sup>th</sup> edition (DSM-5) defined intellectual disability (intellectual developmental disorder) as “a disorder with onset during the developmental period that includes both intellectual and adaptive behavior deficits in conceptual, social, and practical domains”, (American Psychiatric Association, APA, 2013, p. 33).

For purposes of diagnosis, intellectual functioning is currently best conceptualized and captured by a general factor of intelligence, which is a general mental ability best represented by a full-

scale or composite score (APA, 2013; Schalock et al., 2010). Intelligence includes reasoning, planning, solving problems, thinking, comprehending complex ideas, learning quickly, and learning from experience (Arvey et al., 1994; Gottfredson, 1997). The “significant limitations in intellectual functioning” criterion for a diagnosis of ID requires a full-scale IQ score that is approximately two standard deviations below the mean, considering the standard error of measurement for the specific, individually administered instruments used, and the instruments’ psychometric properties. All other sources of measurement error, such as the Flynn effect and practice effects, should also be considered when interpreting test results.

For purposes of diagnosis, adaptive behavior is 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). Measurement of adaptive behavior uses individually administered instruments, as well as other sources of relevant clinical information, and focuses on whether the person has significant limitations in one or more of the three adaptive skill areas (conceptual, social, or practical). Significant limitations in adaptive behavior are objectively established through the use of standardized measures normed on the general population, including people with disabilities and people without disabilities. Similar to the assessment of intellectual functioning, the “significant limitations in adaptive behavior” criterion for a diagnosis of ID is an adaptive behavior score that is approximately two standard deviations below the mean in one of the three adaptive skill areas, considering the standard error of measurement for the respective skill area and the instruments’ psychometric properties. Interpretation of adaptive behavior assessment results should consider respondent reliability, whether present functioning is considered within the context of community environments and compared to same-age peers, as well as all other sources of measurement error.

With the better understanding of intellectual functioning and adaptive behavior as reflected in the previous diagnostically related operational definitions, the field of ID is now in a better position to address a question that sometimes arises in clinical decisions and recommendations: “Is there a relation between deficits in intellectual functioning and deficits in adaptive behavior, and if so, how should the relation be expressed, and how does it affect the

diagnostic criteria used to establish intellectual disability?” In addressing this key question, we (a) provide an update of the understanding of adaptive behavior; (b) dispel two thinking errors regarding mistaken temporal or causative relation between intellectual functioning and adaptive behavior; (c) explain that there is a strong correlational, but no causal relation between intellectual functioning and adaptive behavior; and (d) assert that once a question of whether a person has ID is raised, both intellectual functioning and adaptive behavior are assessed, considered jointly, and weighed equally in the diagnosis of intellectual disability. Throughout the article we emphasize strongly that *the constructs of intellectual functioning and adaptive behavior and their assessment must be weighed equally and considered jointly in the diagnosis of ID.*

### Understanding Adaptive Behavior

When first proposed by AAIDD in their draft version of the 5<sup>th</sup> edition of the Terminology & Classification (T&C) manual (Heber, 1959), adaptive behavior was introduced as being composed of three principle elements: learning, social adjustment, and maturation. AAIDD quickly subsumed these three elements into the broad construct of adaptive behavior in the official version of the 5<sup>th</sup> edition of the T&C manual (Heber, 1961). For the next 40 years, the concept of adaptive behavior evolved from a single, largely undefined term to a measurable construct whose factor structure and measurement are now understood to include conceptual, social, and practical adaptive skills that have been learned and are performed in the community by people in their everyday lives (Luckasson et al., 2002; Schalock et al., 2010; Thompson, McGrew, & Bruininks, 1999). Tassé and his colleagues (2012) have argued that Heber’s (1959) original proposal of the aforementioned three skill areas overlap perfectly with the current 3-factor model of adaptive behavior comprising conceptual, social, and practical skills.

With this accepted and empirically validated conceptualization, adaptive behavior can be considered on an equal footing in terms of weight and metrics with intellectual functioning in the understanding and diagnosis of ID (Schalock et al., 2012). Adaptive behavior is also uniquely able to be used effectively to provide a framework for person-referenced education and habilitation goals and individualized support strategies, direct attention to an essential dimension of human function-

ing, and serve as an independent variable in outcomes evaluation (Luckasson & Schalock, 2013; Tassé, 2009; Tassé et al., 2012).

## Overcoming Thinking Errors

### Temporal

Typically in the definitions of intellectual disability, a form of the phrase “intellectual functioning” appears first. Unfortunately this has led some people to conclude incorrectly that significant limitations in intellectual functioning and adaptive behavior should be considered sequentially. This thinking error leads inaccurately to linear or sequential thinking that limitations in intellectual functioning is the primary criterion of a diagnosis of ID, and that significant limitations in adaptive behavior are secondary. There is a simple historical explanation for this thinking error. The explanation is that since intellectual functioning was initially better understood and able to be formally assessed earlier in the 1900s, the level of intellectual functioning became the fulcrum for the diagnosis. It was during the 1930s, for example, that mental testing greatly influenced both public policy and clinical actions in the United States. Analogously, internationally, the use of “IQ” to diagnose individuals with intellectual disability was facilitated by the availability of “IQ tests” (Schalock, 2011), and the lack of comparable formal adaptive behavior scales, which did not appear until the late 1960s (Nihira, 1999). Because intelligence was better defined, conveniently measured with standardized tests and expressed as easily understood IQ scores, and listed first in most definitions of ID, it was understandable that deficits in intellectual functioning erroneously became in people’s thoughts and actions the primary criterion used in ID diagnoses.

Despite this historical overreliance on the construct of intellectual functioning in the diagnostic process, there was an understanding that the sole reliance on intellectual functioning did not take into account the skills and behaviors necessary for a person to learn and adapt to societal expectations and demands. To this end, Tredgold (1937) referred to the need to also measure “social incapacity” among people diagnosed with intellectual disability. This need for a more complete understanding of ID and its valid diagnosis led to the search for a construct that could measure the person’s ability to learn the skills and behaviors necessary to adapt to societal expectations and demands. Adaptive behavior was originally introduced in the form of “social competence”

by Edgar Doll (Doll, 1936, 1953) and later evolved into adaptive behavior as described initially by Heber (1959, 1961) and later by Tassé et al. (2012).

### Causative

With the publication of the DSM-5 (APA, 2013), the notion of causation has emerged as a second thinking error. The DSM-5 replaced IQ scores with level of adaptive behavior deficits as the metric to be used in determining the severity levels of intellectual disability (e.g., mild, moderate, severe, and profound). In so doing, the DSM-5 justified this change by arguing that adaptive behavior is a more salient and relevant construct than intellectual functioning in predicting the intensity of supports needed (APA, 2013). Although it appears that the DSM-5 emphasized the importance of the adaptive behavior construct over intelligence, this was negated by an erroneous phrase. As stated in the DSM-5: “*To meet diagnostic criteria for intellectual disability, the deficits in adaptive functioning must be directly related to the intellectual impairments described in Criterion A*” (p. 28). This phrase implied that deficits in adaptive behavior are *caused by* deficits in intellectual functioning. With this added phrase, the DSM-5 inadvertently created a fourth diagnostic criterion, one that is virtually impossible for clinicians to implement and is unsupported by science. Our concern is that though a clinician can validly assess the person’s functioning and establish the presence of significant limitations in intellectual functioning and adaptive behavior, it is unclear how one would go about establishing the causal link between the two. It would probably be entirely speculative on the part of the clinician to assert that the deficits in adaptive behavior are *directly related* to the deficits in intellectual functioning, or, conversely, that the deficits in intellectual functioning are *directly related* to the deficits in adaptive behavior. Even with repeated testing over a lifespan, a clinician might be able to document the onset of these deficits but would still be unable to assert with confidence that one caused the other. It is far more likely that the deficits in intellectual functioning and adaptive behavior are in fact caused by a third independent factor (e.g., brain development or injury).

The erroneous implication of causation is both an error in thinking and a notion not supported by the evidence as reflected in published definitions of mental retardation or intellectual disability over the past five decades. Specifically, in Table 1 we provide

Table 1  
*Definitions and Diagnostic Criteria of Intellectual Disability*

Diagnostic System / Edition	Definition of Intellectual Disability
AAMD DRAFT of 5 <sup>th</sup> Edition (Heber, 1959)	<i>“Mental retardation refers to subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in one or more of the following: (1) maturation, (2) learning, and (3) social adjustment.”</i>
AAMD 5 <sup>th</sup> Edition (Heber, 1961)	<i>“Mental retardation refers to subaverage general intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior.”</i>
AAMD 6 <sup>th</sup> Edition (Grossman, 1973)	<i>“Mental Retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior, and manifested during the developmental period.”</i>
AAMD 7 <sup>th</sup> Edition (Grossman, 1977)	<i>“Mental Retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior, and manifested during the developmental period.”</i>
AAMD 8 <sup>th</sup> Edition (Grossman, 1983)	<i>“Mental retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period.”</i>
AAMR 9 <sup>th</sup> Edition (Luckasson et al., 1992)	<i>“Mental retardation refers to substantial limitations in present functioning. It is characterized by significantly subaverage intellectual functioning, existing concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work. Mental retardation manifests before age 18.”</i>
AAMR 10 <sup>th</sup> Edition (Luckasson et al., 2002)	<i>“Mental retardation is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.”</i>
AAIDD 11 <sup>th</sup> Edition (Schalock et al., 2010)	<i>“Intellectual disability is characterized by significant limitations in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18.”</i>

(Table 1 continued)

Table 1  
Continued

Diagnostic System / Edition	Definition of Intellectual Disability
DSM (APA, 1952)	<i>“Here will be classified those cases presenting primarily a defect of intelligence existing since birth, without demonstrated organic brain disease or known prenatal cause. This group will include only those cases formerly known as familial or “idiopathic” mental deficiencies. The degree of intelligence defect will be specified as mild, moderate, or severe, and the current I.Q. rating, with the name of the test used, will be added to the diagnosis. In general, mild refers to functional (vocational) impairment, as would be expected with I.Q.’s of approximately 70 to 85; moderate is used for functional impairment requiring special training and guidance, such as would be expected with I.Q.’s of about 50-70; severe refers to the functional impairment requiring custodial or complete protective care, as would be expected with I.Q.’s below 50.”</i>
DSM-II (APA, 1968)	<i>“Mental retardation refers to subnormal general intellectual functioning which originates during the developmental period and is associated with impairment of either learning and social adjustment or maturation, or both.”</i>
DSM-III (APA, 1980)	<i>“The essential features are: (1) significantly subaverage general intellectual functioning, (2) resulting in, or associated with, deficits or impairments in adaptive behavior, (3) with onset before the age of 18. The diagnosis is made regardless of whether or not there is a coexisting mental or physical disorder.”</i>
DSM-III-R (APA, 1987)	<i>“The essential features of this disorder are: (1) significantly subaverage general intellectual functioning, accompanied by (2) significant deficits or impairments in adaptive functioning, with (3) onset before age of 18. The diagnosis is made regardless of whether or not there is a coexisting physical or other mental disorder.”</i>
DSM-IV (APA, 1994)	<i>“The essential feature of Mental Retardation is significantly subaverage general intellectual functioning (Criterion A) that is accompanied by significant limitations in adaptive functioning in at least two of the following skill areas: communication, self-care, home living, social/interpersonal skills, use of community resources, self-direction, functional academic skills, work, leisure, health, and safety (Criterion B). The onset must occur before age 18 years (Criterion C).”</i>

(Table 1 continued)

Table 1  
Continued

Diagnostic System / Edition	Definition of Intellectual Disability
DSM-IV-TR (APA, 2000)	<p><i>“The essential feature of Mental Retardation is significantly subaverage general intellectual functioning (Criterion A) that is accompanied by significant limitations in adaptive functioning in at least two of the following skill areas: communication, self-care, home living, social/interpersonal skills, use of community resources, self-direction, functional academic skills, work, leisure, health, and safety (Criterion B). The onset must occur before age 18 years (Criterion C). Mental retardation has many different etiologies and may be seen as a final common pathway of various pathological processes that affect the functioning of the central nervous system.”</i></p>
DSM-5 (APA, 2013)	<p><i>“Intellectual disability (intellectual developmental disorder) is a disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, social, and practical domains. The following three criteria must be met:</i></p> <ul style="list-style-type: none"> <li data-bbox="783 1031 1398 1199"><i>A. Deficits in intellectual functions, such as reasoning, problem solving, planning, abstract thinking, judgement, academic learning, and learning from experience, confirmed by both clinical assessment and individualized, standardized intelligence testing.</i></li> <li data-bbox="783 1205 1398 1478"><i>B. Deficits in adaptive functioning that result in failure to meet developmental and sociocultural standards for personal independence and social responsibility. Without ongoing support, the adaptive deficits limit functioning in one or more activities of daily life, such as communication, social participation, and independent living, across multiple environments, such as home, school, work, and community.</i></li> <li data-bbox="783 1484 1398 1545"><i>C. Onset of intellectual and adaptive deficits during the developmental period.”</i></li> </ul>

*Note.* AAMD and AAMR are now American Association on Intellectual and Developmental Disabilities (AAIDD). DSM = *Diagnostic and Statistical Manual of Mental of Mental Disorders* of the American Psychiatric Association (APA).

the full text of the published definitions of mental retardation/intellectual disability, going back to the 1959/1961 definitions for the American Association for Intellectual and Developmental Disabilities (AAIDD, then American Association on Mental Deficiency) and 1952 for the DSM (American Psychiatric Association, 1952). Note-

worthy is the slight variation in conjunctions. For AAIDD, the conjunctions used have been “associated with” (Heber, 1959, 1961), “existing concurrently with” (Grossman, 1973, 1977, 1983; Luckasson et al., 1992), and “both in . . . as expressed in” (Luckasson et al., 2002; Schalock et al., 2010). For the DSM, the conjunctions used

have been “associated with” (APA, 1968), “resulting in, or associated with” (APA, 1980), “accompanied by” (APA, 1987, 1994, 2000), and “that includes both” (APA, 2013). Throughout the past 50+ years of definitions promulgated by both AAIDD and APA, *any relation between intellectual functioning and adaptive behavior has repeatedly and consistently been described as a correlational relation (e.g. “associated with,” “existing concurrently,” “including both”), and not a causal relation.* In fact, over the past half-century the only time there was any mention of one construct causing or resulting in the other in the diagnostic and classification systems for intellectual disability was in the third edition of the DSM (APA, 1980). This statement was immediately abandoned and changed in the revision of the DSM-III to “concurrent deficits or impairments in adaptive behavior” (see: DSM-III-R; APA, 1987). We recommend an immediate comparative revision to the DSM-5 to correct this thinking error.

### Equal Weight and Joint Consideration

There are no published studies supporting the notion of a causal link between intelligence and adaptive behavior. Because there have been studies (see Tassé et al., 2012) documenting the correlational relationship between intellectual functioning and adaptive behavior, and because the constructs of intellectual functioning and adaptive behavior and their assessment are better understood and comparable in terms of the metrics used in their assessment, *both must be weighed equally and considered jointly in the diagnosis of ID.* The ordering of the presentation of these two criteria in all diagnostic systems is merely historical and should not be interpreted as a sequential ordering or steps in the diagnostic process. The following empirical findings and best clinical practices support this position.

1. The relation between intellectual functioning and adaptive behavior has been expressed historically and consistently as correlational, not causative (see Table 1).
2. Demonstrating a causative relationship between these two criteria for a diagnosis of ID is clinically impossible and irrelevant, and attempting to do so would mistakenly add a fourth criterion to the diagnostic process.
3. A complete understanding of human functioning requires an understanding of the person’s typical performance, which is the case in the assessment of adaptive behavior, not maximum performance, which is the case in the assessment of intellectual functioning (Luckasson & Schalock, 2015).
4. A variety of factors can be used as a basis for subgroup classification, including level of support needs, adaptive behavior, or intellectual functioning (Schalock & Luckasson, 2015). AAIDD has long urged that various classification systems be developed to ensure a meaningful subgrouping of individuals according to criteria that are relevant to the purpose of the classification (Luckasson et al., 1992, 2002; Schalock et al., 2010). DSM-5 followed this established trend in proposing that the person’s level of adaptive behavior or level of support needs be used to determine classification levels for ID (DSM-5; APA, 2013).
5. A valid diagnosis of ID requires the clinician to synthesize/integrate assessment of intellectual functioning *and* adaptive behavior while following these two standards of clinical judgment (Schalock & Luckasson, 2014; Luckasson & Schalock, 2015): (a) clinical judgment employs research-based best practices in diagnosis, classification, and planning supports; and (b) clinical judgment incorporates the multidimensionality of human functioning in diagnosis, classification, and planning supports. A recognition of the important role of clinical judgment is also emphasized in the DSM-5 diagnostic criteria.
6. The definitions of ID, going back more than 50 years to the present, confirm that any relationship between intellectual functioning and adaptive behavior has always been correlational. There is no empirical evidence to support inserting a causal interpretation between the two. A recent error in DSM-5 to the contrary, suggesting there is a possible causal relationship, is unsupported by either science or clinical practice, and would erroneously add a new fourth diagnostic element to the definition of ID that would be impossible to establish clinically.

## Summary and Conclusion

In summary, in this article we have provided an updated understanding of adaptive behavior, dispelled two thinking errors regarding the temporal or causative relation between intellectual functioning and adaptive behavior, explained that there is a strong correlational but no causal relation between intellectual functioning and adaptive behavior, and asserted that when a question of ID determination is raised, both intellectual functioning and adaptive behavior are assessed and considered jointly and weighed equally in determining a diagnosis of intellectual disability.

In conclusion, the constructs of intellectual functioning and adaptive behavior and their assessment must be weighed equally and considered jointly in the diagnosis of ID. Correlation does not mean causation. There is no prioritization or prescribed sequence for these two criteria required for a diagnosis of intellectual disability. As co-equals, the diagnostic process can begin with intellectual functioning or adaptive behavior. Once a question of whether a person has ID is raised, the diagnostic process can begin with the assessment of adaptive behavior or intellectual functioning; both must be considered jointly and weighed equally. Any attempt to shortcut the evaluation/assessment process by conducting only half the needed assessment is inconsistent with professional responsibility and established clinical practice.

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