Synthesis Report 54

Expectations for Students with Cognitive Disabilities: Is the Cup Half Empty or Half Full? Can the Cup Flow Over?

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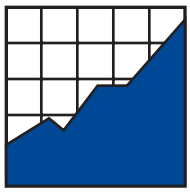
November 2004

McGrew, K. S., Evans, J. (2004). *Expectations for students with cognitive disabilities: Is the cup half empty or half full? Can the cup flow over?* (Synthesis Report 54). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.



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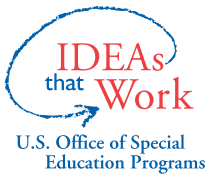
The Center is supported through a Cooperative Agreement (#H326G000001) with the Research to Practice Division, Office of Special Education Programs, U.S. Department of Education. The Center is affiliated with the Institute on Community Integration at the College of Education and Human Development, University of Minnesota. Opinions expressed herein do not necessarily reflect those of the U.S. Department of Education or Offices within it.



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Executive Summary

To make informed decisions about the best instruction and assessments for students with cognitive disabilities, several questions need to be answered. For instance, how many students with cognitive disabilities can be expected to achieve the same level of proficiency as other students? To what extent can we predict who these students are? Can we discern whether a student's failure to meet proficiency is due to the student's disabling condition or lack of appropriate instruction? Finally, what effects do teacher expectations have on student achievement?

This report addresses these questions, and includes an analysis of nationally representative cognitive and achievement data to illustrate the dangers in making blanket assumptions about appropriate achievement expectations for individuals based on their cognitive ability or diagnostic label. In addition, a review of research on the achievement patterns of students with cognitive disabilities and literature on the effects of teacher expectations is included.

The literature raises numerous issues that are directly relevant to today's educational context for students with disabilities in which both the Individuals with Disabilities Education Act (IDEA) and the No Child Left Behind (NCLB) Act of 2001 are requiring improved performance. Particularly for those students with cognitive disabilities, the information on expectancy effects should cause us much concern. Is it possible that expectancy effects have been holding students back in the past? Are we under the influence of silently shifting standards, especially for students with cognitive disabilities? It is anticipated that the information in this report will help guide decisions about appropriately high and realistic academic expectations for students with cognitive disabilities.

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Introduction

Over the past 30 years the United States has slowly and steadily clarified the meaning of access to a free and appropriate public education (FAPE) for students with disabilities. Today's interpretation of FAPE certainly differs from that of 1975 when the Education for All Handicapped Children Act initially was passed into law (EHA, 1975), and even from 1990 when the reauthorization of EHA changed the name to the Individuals with Disabilities Education Act (IDEA, 1990). Case law (e.g., *Board of Education of the Hendrick Hudson Central School District v. Rowley, 1982*), subsequent amendments to IDEA, federal regulations, and guidance continue to create expectations about the extent to which students with disabilities are expected to benefit academically from their education. Unfortunately, there is still limited consensus among educators regarding appropriate achievement expectations for students with disabilities, particularly those with cognitive disabilities.

A concern about low expectations and the need for high expectations was reflected in the IDEA's 1977 Preamble: "Over 20 years of research has demonstrated that the education of children with disabilities can be made more effective by (A) having high expectations for such children and ensuring their access to the general education curriculum to the maximum extent possible . . ." (IDEA, 1997, § 601). IDEA 1997 clarified that all students with disabilities are to have access to instruction focused on the same skills and knowledge as all other students, and that their achievement is to be measured with the same district and statewide assessment programs as used for all students (and, adding an alternate assessment for those students unable to participate in the general assessment).

The *No Child Left Behind (NCLB) Act of 2001* further clarified that schools are to be held accountable for the adequate yearly progress (AYP) of all groups of students. NCLB specifically requires the disaggregation of assessment data for specified subgroups, including students with disabilities. The intended purpose of NCLB is "to ensure that all children have a fair, equal, and significant opportunity to obtain a high quality education and reach, at a minimum, proficiency on challenging State academic achievement standards and state academic assessments" (NCLB, 2001, § 1001). In other words, the expected educational outcomes for students with disabilities, or for any other subgroup of students, are the same high expectations held for all students.

Although data show that some students with disabilities are reaching the state-determined level of proficiency, many students with disabilities are still far from performing at this level (Thurlow & Wiley, 2004). Students with disabilities participate in proficiency assessments in three primary ways: (1) participation in the general assessment without accommodations, (2) participation in the general assessment with accommodations, and (3) participation in an alternate assessment. Federal regulations released December 9, 2003 clarified that an alternate assessment could be based on alternate achievement standards for students with significant cognitive disabilities.

Alternate assessments could also be based on grade-level achievement standards. Both types of alternate assessments are to be aligned to content standards appropriate for the student's grade level of enrollment.

For NCLB accountability purposes, only up to one percent of all students (approximately nine percent of students with disabilities) can be counted for AYP as proficient or advanced based on alternate achievement standards (with possible exceptions for states or districts if certain conditions are met). Thus, with the exception of students working toward alternate achievement standards, (described in the December 9, 2003 regulation as those with significant cognitive disabilities), all students with disabilities are to be held to the same grade-level achievement standards as their peers without disabilities.

Many educators have grown increasingly concerned about the performance of students with cognitive disabilities who are appropriately working toward grade-level achievement standards, but whose current performance is far from a proficient level on grade-level achievement standards as measured by current statewide assessments. Considerable controversy surrounds the issue of what can and should be expected for these students. Some people argue that the vast majority of students with disabilities, when given appropriate access to high quality curriculum and instruction, can meet or exceed the levels of proficiency currently specified. Many special education advocates believe that subscribing to the same high expectations and accountability for student progress will ultimately lead to improved instruction and learning for all students. Others argue that a student's disability will ultimately prevent the student from attaining grade-level achievement standards, even when provided appropriate instruction and accommodations. This latter group believes that it is unjust to punish schools when these students fail to perform at the proficient level.

The discrepant "expectations" arguments reflect very different perspectives regarding the nature of cognitive disabilities. These two perspectives have existed for many years. To make informed decisions about the best instruction and assessments for students with cognitive disabilities, several questions need to be answered. For instance, how many students with cognitive disabilities can be expected to achieve the same level of proficiency as other students? To what extent can we predict who these students are? Can we discern whether a student's failure to meet proficiency is due to the student's disabling condition or lack of appropriate instruction? Finally, what effects do teacher expectations have on student achievement?

This report was prepared to begin to address these issues. It includes an analysis of nationally representative cognitive and achievement data to illustrate the dangers in making blanket assumptions about appropriate achievement expectations for individuals based on their cognitive ability or diagnostic label. In addition, a review of research on the achievement patterns of students with cognitive disabilities and literature on the effects of teacher expectations is included.

It is anticipated that the information in this report will help guide decisions about appropriately high and realistic academic expectations for students with cognitive disabilities.

Overview

Few would argue that the concept of intelligence (IQ), and tests that measure the construct, have played a long and significant role in education, and special education in particular. The use of practical IQ tests is typically traced to the beginning of the century when Alfred Binet developed a battery of tasks to help identify children with learning difficulties (Neisser et al., 1996). Binet's goal was to develop a means by which to identify struggling students who would then receive remediation via "mental orthopedics." Clearly, Binet did not believe that his measure of intelligence quantified an innate or "fixed" ability. Binet was an optimist who believed that the ability "glasses" of children with lower ability were half full, and that their vessels could be filled further.

In stark contrast to Binet's optimistic position was that of English psychologist Sir Cyril Burt (1911). Burt's work was based on the then popular view that intelligence was a genetically based fixed entity. Burt's ideas influenced the design of educational systems that segregated children in different educational tracks based on ability. According to Burt, "capacity must obviously limit content. It is impossible for a pint jug to hold more than a pint of milk; and it is equally impossible for a child's educational attainments to rise higher than his educable capacity permits." Clearly Binet and Burt viewed the proverbial half-filled glass differently.

A final view, based on the 1994 feel-good movie *Forrest Gump*, can be considered the "cup overflowing" perspective. Briefly, this movie portrayed the fictitious life history of Forrest Gump, an individual who was classified in the mental retardation range early in school. The exchange between the school principal and Forrest's mother clearly illustrated an educational approach grounded in the Burt philosophy:

> School principal: "Your boy's... different, Miz Gump. His IQ's 75."
>
> Ms. Gump: "Well, we're all different, Mr. Hancock. He might be a bit on the slow side. He's not going to a special school to retread tires!"

Ms. Gump's response, and the subsequent string of life achievements of her son Forrest (e.g., star football player in college, world class ping pong player, Vietnam war hero, CEO of successful shrimp company) reflects the "cup flowing over" perspective on IQ test scores. That is, Forrest's achievements were beyond his measured IQ (which was below the average sized "jug" according to Burt).

When faced with students whose classroom performances or achievement test scores surpass their measured (or implicitly estimated) IQ scores by significant amounts, laypersons and professionals (e.g., educators and psychologists) frequently demonstrate an implicit subscription to a Burt philosophy that a person can achieve only up to his or her level of intelligence when they characterize Gump-like students as "overachievers." Ms. Gump's implicit intelligence conception, which was subsequently manifested in Forrest's accomplishments, would suggest that there is more to school learning than the size of a child's "IQ cup or jug"—other variables contribute to achievement.

Half-full or half-empty? Filled to-the-brim or the cup flowing over? Which intelligence-learning metaphor is correct? Burt versus Binet/Gump? Who should be believed during the current standards-driven educational reform fueled by the mantra that "no child shall be left behind" (NCLB), and that all children should reach grade level standards. More importantly, which philosophy should guide educational expectations for students whose primary special education classification is tied closely to IQ scores below the normal range (i.e., students with mental retardation or cognitive disabilities)? Should educational expectations for students with cognitive disabilities be grounded in a Burt philosophy (i.e., expect academic performance and achievement no higher than the student's estimated cognitive ability), or should expectations be based on the more optimistic Gump philosophy (i.e., it is possible for students with cognitive disabilities to achieve higher than their IQ test score and at grade level)? Is the Gump philosophy (i.e., a child's IQ cup can overflow) nothing more than a Pollyannaish belief based in fiction?

The primary purpose of this paper is to address the formation of appropriate expectations for students with cognitive disabilities by exploring the known empirical relations between intelligence and school achievement. In addition, a review of the research literature on how *expectation effects*, which are often based on perceptions of student ability and implicit theories of intelligence, can influence student performance.

Diversity within Disability Distributions

Probably no environment elicits individual differences sooner in life than formal education. In classrooms teachers strive to arrange conditions to elicit optimal performance among a diverse class of unique learners. However, due to the only true "law" in psychology (the law of individual differences), optimal learning conditions and techniques are not universal across learners.

This holds true for all learners—those with and without disabilities. It is important that students with disabilities not be saddled with group-based stereotyped low academic expectations. Just as the diversity of learning rates for students without disabilities is acknowledged, so it should be for students with disabilities. According to the 1997 National Research Council report *Educating One & All: Students with Disabilities and Standards-Based Reform*, "it is hard to talk

about asking students in special education to the meet the same standards and outcomes as everyone else without paying attention to their *varied characteristics* [italics added]" (Olson, 2004, p. 10).

The federally funded *Special Education Elementary Longitudinal* (SEELS) study, the first ever nationally representative longitudinal investigation of elementary students with disabilities (ages 6 to 12), recently provided empirical support for the diversity of achievement levels of students with disabilities. According to the SEELS project director, José Blackorby, the data indicate that "you can find kids with disabilities who are scoring right near the top—above the 80th percentile—and you you'll find some in the middle…and then a lot more kids in the lowest quartile. So it's heavily weighted toward the low end but there's quite a bit of diversity" (Olson, 2004, p. 10). Although students with disabilities, as a group, tend to achieve in the lower half of the distribution of achievement, "individuals with disabilities can be found across the full range of academic performance" (Olson, 2004, p. 10). What accounts for the diversity of learning among students with disabilities, and for that matter, among all students?

IQ and Disability: The Misunderstood Common Denominator

Despite their diversity of characteristics, the majority (58%) of students receiving special education services under IDEA share a common experience—most have been classified as having a learning disability or cognitive impairment (mental retardation) with the aid of an intelligence test. Despite many disputes over competing theoretical conceptualizations of intelligence and the utility of intelligence test scores, even the most ardent critics recognize that IQ tests "predict certain forms of achievement—especially school achievement—rather effectively" (Neisser et al, 1995, p. 96).

Despite a defensible rationale for their early development and continued deployment in the schools (Beirne-Smith, Ittenbach, & Patton, 1998), many people have developed inaccurate perceptions of the power of IQ test scores. Many laypersons, educators, policymakers, and other professionals have developed the inaccurate belief, often reinforced by court decisions (Reschly, 1988), that measured intelligence is a genetically determined, largely fixed, global, and enduring trait that explains most of a student's success (or failure) in school learning. Such a Sir Cyril Burt conceptualization of intelligence can doom a student to low expectations if his or her IQ score is significantly below the norm. This fixed entity view of intelligence, summarized in the belief in the predictive power of the single global IQ score, represents the mental jug or cup being "half-empty" or "filled to the brim" philosophy. According to this view, to expect more academic achievement than a person's estimated or measured IQ score is simply not possible.

A recent *Education Week* (2004) national survey (*Count me in: Special Education in an Era of Standards*) of 800 special and general education teachers suggests that most educators implicitly

subscribe to the Burt IQ-potential philosophy. Eighty-four percent of surveyed teachers did not believe that students in special education should be expected to meet the same set of academic standards as students without disabilities. In addition, approximately 80% of the teachers felt that students with disabilities should not be included in the same state tests as students in general education, especially if the results are used for accountability purposes (Olson, 2004).

The surprising extent to which educators appear to hold alternative (and typically lower) standards and expectations for students with disabilities, although appropriate for many of these students, is troubling given the empirical reality of the predictive power of IQ test scores—scores that are often at the root of lowered expectations. Sir Cyril Burt's IQ-fixed potential legacy appears to be alive and well in America's schools (albeit not typically adopted maliciously or explicitly articulated).

Fortunately, decades of research on intelligence tests have repeatedly converged on a near unanimous consensus on the predictive accuracy of IQ test scores (Neisser et al., 1995). This consensus, which is explained next, indicates that it is time to "leave the Burt IQ-potential philosophy behind."

Reality of the IQ-Achievement Relationship: Statistics Made Simple

In an era of standards-driven educational reform, educators and policymakers must recognize the truth about IQ test scores and the resulting disability categories that are based on a continuum of IQ test scores (e.g., mental retardation). The reality is simple. Given, the best available, theoretically and psychometrically sound, nationally standardized, individually administered intelligence test batteries, three statements hold true. Each of these can be explained in depth, and some of this explanation is provided in Table 1. For greater conciseness here, the statements that hold true are:

- IQ test scores, under optimal test conditions, account for 40% to 50% of current expected achievement.
    - Thus, 50% to 60% of student achievement is related to variables "beyond intelligence."
- For any given IQ test score, half of the students will obtain achievement scores at or below their IQ score. Conversely, and frequently not recognized, is that for any given IQ test score, half of the students will obtain achievement scores at or *above* their IQ score.

This last truism of intelligence test scores can be demonstrated via statistical equations or with real data. The second option is used here because it provides a more concrete explanation. The statistical explanation is provided in Table 1.

Table 1. Explanations of Statements about the IQ-Achievement Relationship

IQ test scores, under optimal test conditions, account for 40 % to 50 % of current expected achievement.

The typical range of reported concurrent IQ-achievement correlations is .40 to .70 (Reschly & Grimes, 1992), with the best batteries consistently displaying correlations from .60 to .70. Correlations of this magnitude are statistically significant and are among the strongest predictive relations reported across all fields of psychology. However, most laypersons, educators, policymakers, and other professionals, fail to recognize that the pragmatic "reality" of correlations is hidden from view. The critical "rubber-meets-the-road" IQ-achievement information lies in the amount of explained *achievement variance*, a value not directly apparent from a reported correlation. Rather, one simply needs to square a correlation (e.g., $.70^2 = .49$), multiply it by 100 (.49 x 100 = 49), and then tack a percentage symbol on the end (49 %). This value represents the amount of explained variance represented by a correlation. For example, an IQ-achievement correlation of .70 would indicate that "the amount of achievement variance accounted for by intelligence is approximately 49 %." A correlation of .60 accounts for approximately 40 % of achievement ($.60^2$ x 100 = 36 %).

50 % to 60 % of student achievement is related to variables "beyond intelligence."

It is beyond the scope of the current paper to review the extensive research on models of school learning that indicate that student intelligence and prior achievement are only two of a number of unique student characteristics (e.g., motivation, self-efficacy, social skills, self-regulatory learning strategies, etc.) that interact in a complex multivariate manner with quantity of instruction, quality of instruction, classroom climate, home environment, peer group, and exposure to mass media outside of school to produce academic learning (Neisser, et al., 1995; Reynolds & Walberg, 1992; Walberg, Fraser & Welch, 1986). See McGrew, Johnson, Cosio and Evans, (2004) for a recent synthesis of essential non-cognitive academic facilitators (often collectively referred to as "conative" abilities) that explain additional portions of academic achievement above and beyond IQ.

For any given IQ test score, half of the students will obtain achievement scores at or below their IQ score. Conversely, and frequently not recognized, is that for any given IQ test score, half of the students will obtain achievement scores at or *above* their IQ score.

For statistically inclined readers, this truism of prediction is reflected in the *Standard Error of the Estimate (SE_{est}).* Given IQ and achievement tests on a scale with an M = 100 and SD = 15, and an IQ-Ach correlation of r, SE_{est} = 15 x SQRT ($1-r^2$). If r = .70 and SD_{ach} = 15, then SE_{est} = 10.7. In real world terms, this means, that for any IQ score for this particular IQ test, the expected/predicted achievement (after accounting for regression to the mean effects) would be bracketed by $\pm$ 10.7 points. That is, for any particular IQ score, 68 % of the population would be expected to show a range of 21.4 achievement standard score points (half above and half below the predicted achievement score). Stated differently, for any given IQ score, the predicted/expected achievement score would be bracketed with a "confidence of prediction band" of $\pm$ 10.7 standard score points.

Figure 1 presents a scatter plot of the general IQ and Total Achievement (average across reading, math, and written language) scores for "real" norm subjects from the standardization of the *Woodcock-Johnson Battery Third Edition* (WJ III; Woodcock, McGrew & Mather, 2001). As can be seen in Figure 1, there is a strong linear relation between IQ and achievement, as evidenced by a strong correlation of .75. For illustrative purposes, subjects with IQs ranging between 70 and 80 are designated in Figure 1.

Figure 1. The Relationship Between General Intelligence and Total Achievement in a Nationally Representative Sample

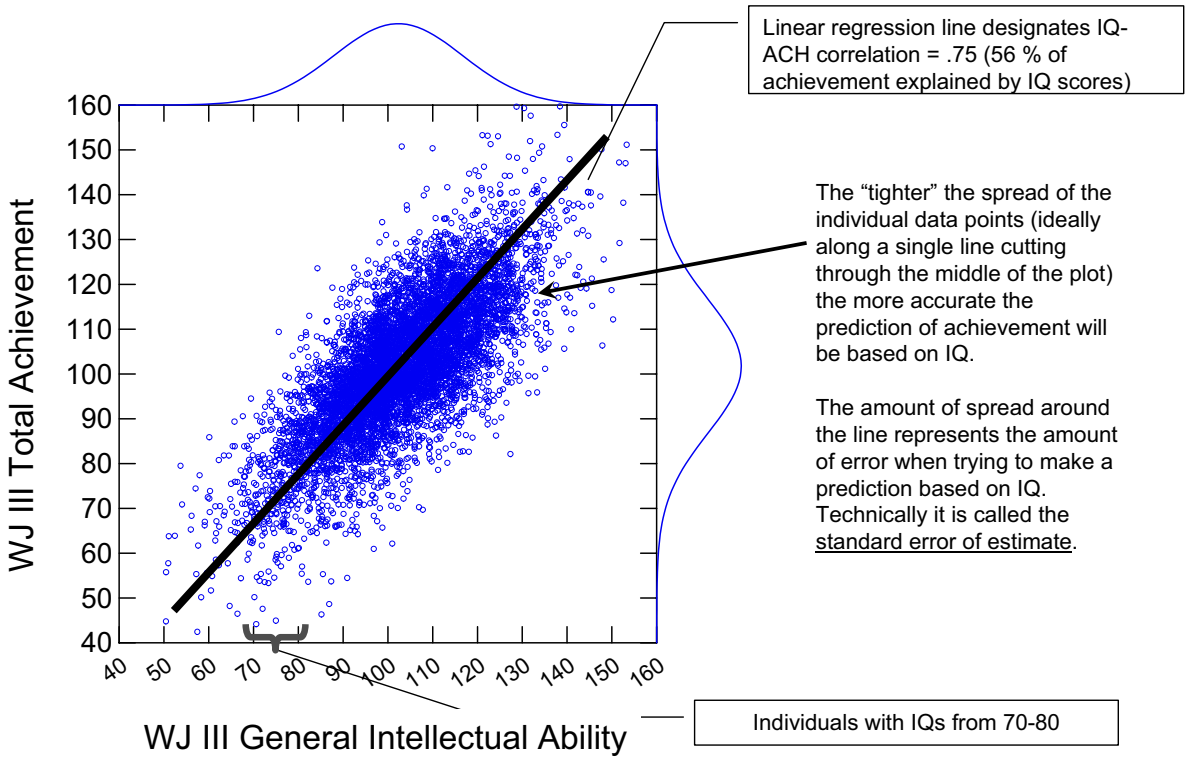

Figure 1. The relationship between general intelligence and total achievement in a nationally representative sample – these are REAL subjects from the WJ III standardization sample (McGrew & Woodcock, 2001) (Note. Scores are in standard score metric with Mean = 100, Standard Deviation = 15)

The data presented in Figure 1 are based on unpublished analyses of the WJ III standardization by the first author of the current paper (McGrew, et al., 2004).

Figure 2. Distribution of WJ III Total Achivement Scores for WJ III Norm Subjects with IQs 70-80

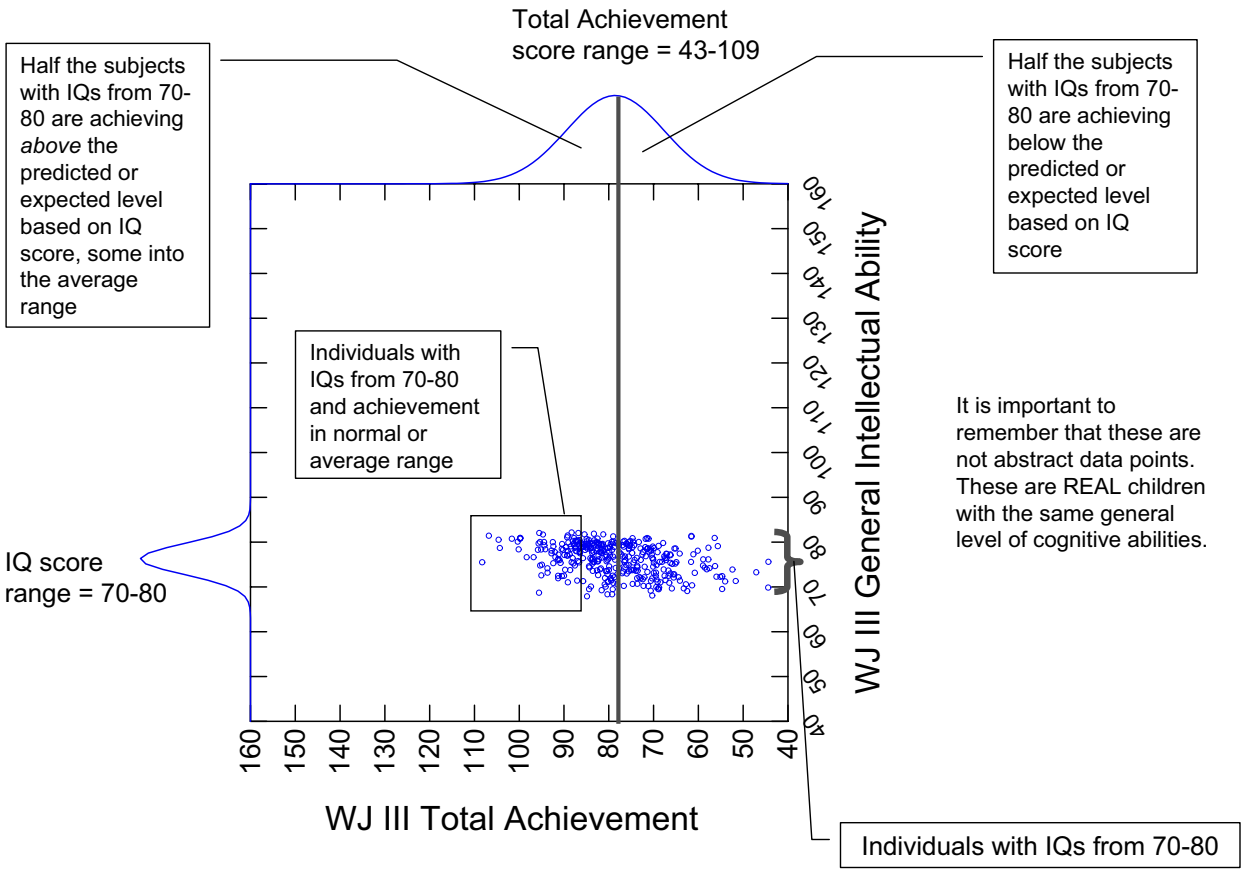

Figure 2. Distribution of WJ III Total Achievement scores for WJ III norm subjects with IQs 70-80. Note that the axes of this figure have been rotated from that in Figure 1.

The data presented in Figure 2 are based on unpublished analyses of the WJ III standardization by the first author of the current paper (McGrew, et al., 2004).

Figure 2, which is a rotated and "windowed" view of a select portion of the same data as are in Figure 1 (i.e., subjects with IQs from 70-80), clearly shows that even IQ tests that demonstrate some of the strongest correlations with achievement ($r = .75$) cannot be used to provide perfect estimates of predicted achievement for *individual* students. The range of total achievement scores displayed at the top of the Figure 2 illustrates that for subjects with IQs from 70-80, expected achievement scores range from a low of approximately 40 to a high of approximately 110. More importantly, the distribution of subjects (the data points) shows that half of the individuals with IQs between 70-80 achieve at or below IQ-predicted achievement, and the other half of these individuals score at or *above* IQ-predicted achievement.

The data presented in Figures 1 and 2 suggest that the proper metaphor for the IQ-achievement prediction relationship is that the "cup can flow over." The carte blanch assumption that all students with disabilities should have an alternative set of educational standards and an assessment system is inconsistent with empirical data. Known IQ-achievement prediction research reinforces the position of Martha Thurlow, the director of the National Center on Educational Outcomes, who stated that "we have a range of students who have disabilities, so I would adamantly reject, as a blanket statement, that students with disabilities can't meet the same achievement targets…I would say that's not the case for the broad majority of students with disabilities" (Olson, 2004, p. 10).

The only time when IQ test scores could be used to make perfect predictions about expected achievement for individual students would be when the IQ-achievement test correlation approaches a perfect 1.0. No intelligence test will ever reach this level of prediction, with the reported range of correlations of .40 to .70+ most likely representing a ceiling on IQ-based prediction. This range of correlations refers to ***concurrent*** correlations, where IQ and achievement tests are typically administered during the same period in time. The correlations between IQ test scores and future achievement (e.g., one year later) are typically lower than concurrent correlations, which makes the prediction of AYP (annual yearly progress) based on IQ test score (or disability status as a crude intelligence proxy variable) even less precise.

The current reality is that despite being one of the flagship developments in all of psychology (Embretson, 1996; Neisser, 1995), intelligence tests are fallible predictors of academic achievement. IQ test scores (and associated IQ-based disability category labels) are adequate, but not nearly sufficient metrics, by which to make reasonably precise predictions about any particular *individual* student's future expected achievement progress. It simply cannot be done beyond a reasonable doubt.

The fallibility of IQ tests, coupled with the enduring presence of the ghost of Sir Cyril Burt's deterministic IQ-achievement educational philosophy, in the context of today's high-stakes educational accountability environment, raises the specter of many children with disabilities being denied the right to appropriate and demanding expectations. Stereotyping students with disabilities (often on the basis of disability label or test scores) as a group that should be excluded from general education standards and assessments is not supported by the best evidence from current science in the field of psychological and educational measurement. The potential soft bigotry of setting a priori IQ or disability label-based low academic expectations (for students with disabilities) needs to be recognized, understood, and minimized, if all children are not to be left behind.