

Chapter 1

Introduction

The process of conducting a psychological and psychoeducational assessment is complex, and the conclusions reached by well-trained psychologists, school psychologists, neuropsychologists, and school neuropsychology diplomates can yield similar findings or widely different interpretations of the results. A number of factors may influence the analyses of these professionals, including their training, their assessment biases, what they are ultimately looking for (a diagnosis, a set of meaningful recommendations, educational placement eligibility, etc.), their ability to adequately communicate with the children they are testing, and their knowledge of the cultural issues relative to the child and/or the child's family. Each factor is critical to a valid assessment and to constructing meaningful sets of recommendations for home, school, and program placement.

Data-based and evidence-based decision making are the hallmarks of a good educational program. The results of individual assessments of students who are suspected of atypical development in one or more areas are used to make recommendations and referrals, and ongoing daily assessments in the classroom and at home enable school personnel to track the success of various intervention strategies. However, when a cultural and/or language difference exists between the children being tested and the examiner, the potential for serious errors, misdiagnoses, and misclassifications increases.

Translating tests into various languages and norming the adapted tests on other students who use those languages can add objective measures for relative performance in specified areas. Nevertheless, more—much more—is needed to obtain valid and reliable test results that lead to accurate and meaningful assessment conclusions and recommendations. It is essential that examiners have the experience and language fluency necessary to conduct the tests. Interpreters can help in some situations, but this approach is not optimal for reasons that will be discussed throughout the text.

Assessing Deaf and Hard of Hearing Children

Psychologists and other professionals who test, assess, and evaluate the performance of deaf and hard of hearing children have an enormous responsibility to obtain the skills, training, and expertise necessary to conduct a comprehensive psychological and psychoeducational evaluation. The complex developmental, environmental, communication, and educational variations presented by deaf and hard of hearing children further complicate the assessment process (M. Miller, 2006). Contrary to what some of these assessment professionals may believe, most deaf and hard of hearing children do not use American Sign Language (ASL), the language of the adult Deaf signing

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community, in the home. ASL has its own lexicon (vocabulary), syntax (grammar), and morphology. Mitchell and Karchmer (2004) reported that the percentage of deaf children with deaf parents has traditionally been overestimated, that only approximately 4% of all deaf children have deaf parents, and that, of those, not all use ASL. The Gallaudet Research Institute 2009–2010 Annual Survey of Deaf and Hard of Hearing Children and Youth (Gallaudet Research Institute, 2011)—the last year for which data were published—reported that only 2.6% of mothers and 1.8% of fathers of deaf children were deaf themselves.

The important question to ask, then, is what *is* the primary or initial language of most deaf children? In the United States, the most common home languages for deaf and hard of hearing children are English (82.3%) and Spanish (21.9%), with ASL in third place at 5.8% (Gallaudet Research Institute, 2011).¹ These statistics have important implications for how the psychological and psychoeducational assessment process should be designed, especially because a child's primary language may change over time. It is no wonder that this daunting task has led to a lack of available consistent and comprehensive approaches to the assessment process with deaf and hard of hearing children and to continuing controversies about which tests to use, which developmental domains to include or exclude from the assessment process, which language to use and for which aspects of the evaluation, and how to address test validity and reliability issues (Braden, 1994; M. Miller, 2006). Each testing situation requires a decision. For example, if we are testing print literacy in English, tests should not be administered in ASL; when testing children who have never been exposed to ASL, that language should not be used; if we are testing language development, not reading or literacy, and if the child has been consistently exposed to ASL, the test should be administered in ASL. We must also be sensitive to the possibility that the language of instruction may be different from the language of the home. The 2009–2010 Annual Survey (Gallaudet Research Institute, 2011) reported that 39.5% of deaf students received instruction through ASL or some form of manual communication, but only 5.8% regularly sign in the home.

A test is said to be valid if it truly measures that which it is supposed to measure (Bradley-Johnson & Evans, 1991; Lyman, 1998). Tests of validity must be conducted on a target group, and they should be accurate enough to produce confidence that the test results shed light on competence and skill development in a certain area. Sometimes when tests are sign adapted, even if they are normed on a number of deaf and hard of hearing children, the use of the visual channel may change the intended purpose of the test or subtest. For example, for a test of auditory memory, a child listens to a list of words or a string of numbers and is asked to repeat them back. A sign-adapted version alters some, if not all, aspects of the test, and although the test may still assess memory and language processing, it certainly is not testing auditory memory. Administering this same kind of test to a deaf or hard of hearing student with excellent auditory skills relative to other deaf students, perhaps because of a hearing aid or a cochlear implant, perhaps does test the auditory memory of this student. What about everyone in between who is deaf or hard of hearing? What are we testing and how would we know?

1. The totals sum to more than 100% because some families reported using more than one language.

In many cases, a sign-adapted test changes the difficulty level of some items (Braden, 1994; Maller, 2003; M. Miller, 2006). Even if only a few items fall within this category, if ceiling rules are followed, deaf children may never be asked questions for which they know the answers—answers they are developmentally expected to know—and the test results underestimate the child's abilities. Conversely, poorly crafted and poorly analyzed sign adaptations may lower the ability of the target word to discriminate between older and younger students who have intact development, and the test results may overestimate a child's abilities in certain developmental areas.

The obstacles to valid and meaningful assessment of deaf and hard of hearing children are great, yet every day, psychologists, school psychologists, psychoeducational specialists, and other professionals are asked to conduct comprehensive assessments of these children and adolescents and to come up with classifications that will address resource and program eligibility, test modifications in school, classroom and home recommendations, and referrals to other professionals for further assessments and intervention programming. This text is designed to assist in this process and to further define the skills required of the examiners, explain the complex nature of these assessments, and describe ways to intelligently utilize existing tests—those that need to be adapted and those that can be administered as they were originally designed—to ensure meaningful assessment of deaf and hard of hearing infants, toddlers, children, and adolescents.

One of the ways we can obtain useful data is to administer various subtests from different tests that yield stronger evidence about a developmental area. This approach is already being advocated for hearing students, and this pattern analysis and Cross-Battery testing—using items or sections from different tests—is gaining popularity and acceptance (Miller, 2010). The strengthening of the field of school neuropsychology is also having an influence on Cross-Battery testing for psychoeducational assessment, as it is lending strength to the concept of giving practitioners the ability to pull apart tests into their component strands if needed and if it serves a useful assessment purpose.

Tremendous strides have been made since the first efforts to assess deaf and hard of hearing students, in the early 20th century. Thousands of studies have reported on investigations of intelligence, visual information processing, short-term memory, theory of mind, and executive functioning, to name just a few areas. However, we have only begun to scratch the surface. For example, as we note in chapter 5, despite the interest in the nonverbal intellectual functioning of deaf children, only five tests have been developed in this area in the last 50 years.

The use of nonverbal, or performance, scales of intelligence raises another issue. As we report, for generations, intelligence tests were administered to deaf children orally, rendering them invalid tests of intelligence. These tests measured speechreading ability and use of residual hearing, with the inevitable result that IQ scores reported for deaf children were low. The move to performance scales represented a major improvement in assessment, with the result that deaf children tended to score within the same range as their hearing peers. However, scientific progress is not necessarily linear; complete reliance on performance scales raised other issues. The verbal and nonverbal scales of an IQ test do not measure the same domains; they are meant to be complementary. Reliance on just the performance scales of a test means reliance on half a test, with implications for reduced accuracy, appropriateness, and validity. As we

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discuss in the text, this has led to research on the use of verbal measures of intelligence that requires the efforts of an experienced examiner with skills in ASL and in Manual Codes on English.

The psychological, psychoeducational, and neuropsychological assessment of any child is complex and must be sensitive to individual, social, cultural, racial, ethnic, and linguistic variables, among others. In the case of deaf and hard of hearing children, the assessment process is even more complex and must take into consideration the age of onset of hearing loss and other factors. For a deaf child, the older the age at onset, the greater the probability that the child has developed mastery of the essential components of spoken language and even print literacy, given intact overall development. In addition to the age of onset, the age of identification of a hearing loss and the age at which intervention involving trained professionals takes place will impact resulting linguistic, cognitive, and academic skill development. Traditionally, many congenitally deaf children were not identified until the age of 2 or 3 years or even later, and intervention might not have occurred until entry into kindergarten or first grade (Moore, 2001). Currently, universal neonatal screening is conducted with most infants, resulting in a high and growing occurrence of identification of hearing loss in infancy and provision of services to the family and child earlier (Moore, M. Miller, & Corbett, 2009). Of equal importance to age of onset, identification, and service delivery is the extent of the hearing loss—mild, moderate, severe, or profound (Moore, 2001). Clearly, a child who sustains a mild hearing loss at age 10 presents a far different educational profile and has different assessment needs than one with profound deafness identified at birth or a child with profound congenital deafness identified at age 4 and first enrolled in school at age 6.

As previously mentioned, although estimates vary, the percentage of deaf and hard of hearing children with additional disabilities is higher than in the general school-age population (Gallaudet Research Institute, 2011). In short, the age of onset of a hearing loss, the extent of the loss, and the possible presence of disabling conditions present additional challenges to valid and reliable assessment that can lead to successful intervention. Not only does a child's being deaf, especially severely or profoundly deaf, present unique challenges to assessment, but also the fact that deafness is considered a "low-incidence 'condition'" (i.e., it is relatively rare to be deaf) presents further complications. Throughout this text, we will address how to determine the appropriate assessment framework and developmental expectations for deaf and hard of hearing children. We will also discuss the efficacy of norms used to measure deaf and hard of hearing children, both norms developed for the hearing population and those developed for deaf children. We will examine when it is appropriate to have separate norms for children and adolescents and in which developmental areas, as well as how those norms are developed and categorized.

Test Misuse

There is a history of test misuse and faulty assessment conclusions with deaf and hard of hearing children (Moore, 2001) that must be reversed. The literature is rife with examples of inappropriate testing procedures that may result in significantly

underestimating deaf and hard of hearing children's intellectual and academic levels (Easterbrooks & Baker, 2002; Maller, 2003). Examiners who have inadequate sign skills and who lack an understanding of the development of deaf and hard of hearing children are particularly prone to misusing tests. If an examiner does not know ASL and, therefore, is unable to communicate in the child's language and communication modality, the results are very likely to be invalid and the decision to test the child unethical or, at best, misguided. The logical step is to refer the child to a psychologist who has the appropriate communication skills, language knowledge, training, and experience to assess deaf and hard of hearing children.

Although the field is asking important questions about validity, reliability, and practical applicability of the psychological and psychoeducational measurements used to evaluate deaf and hard of hearing children (Braden, 1994; Easterbrooks & Baker, 2002; Maller, 2003), few improvements have been made. M. Miller (2006) has identified the following 10 issues (p. 165):

1. There is no consensus on who should be in the "deaf" normative sample—all deaf children, deaf children without disabilities, deaf and hard of hearing children who use ASL or Manual Codes on English, deaf children who use Cued Speech, deaf children whose parents are hearing, pre- or postlingual deaf children, and so forth.
2. Translation protocols need to be determined. Should items be translated into ASL, Signed English, Contact Signs, Cued Speech, or all of them?
3. It's difficult to find sufficient numbers of practicing psychologists who possess superior sign communication skills and who are capable of using a variety of sign and other visual communication skills to present items and accurately comprehend the responses of the children.
4. The tests that need to be used should consist of items that can be translated into sign without losing the item discrimination feature of certain higher-order items.
5. There is no agreement in the field as to which tests require "deaf" norms and which tests only require "hearing" norms or the norms described in the manuals.
6. Measured intelligence needs to be viewed as it should be viewed—merely as an estimate of the *current* level of functioning—instead of as a fixed measure of overall ability and potential.
7. The test developers don't fund the development of large-scale test adaptations and population sampling for deaf and hard of hearing children because of the low-incidence nature of deafness.
8. It's difficult to keep up with revisions of tests in the assessment field.
9. There is a need for standardized procedures that could be used by most of the psychologists currently serving deaf students.
10. Leaders in the assessment field make inappropriate suggestions that assessment specialists should continue to use only nonverbal measures with deaf children because of misinformation about "verbal problems" or because of communication complexities (Sattler & Dumont, 2004; Smith, 2002; Smith & Stovall, 2002).

Assessment Framework

Difficulties in assessing deaf and hard of hearing children's language, communication, intellectual, and social-emotional development are exacerbated by the dearth of assessment materials normed on deaf and hard of hearing children and by the absence of a critical mass of examiners with the ability to fully communicate with and analyze the communication skills of the children (Easterbrooks & Baker, 2002). The field needs a general assessment framework or foundation that can be flexible enough to be used with all deaf and hard of hearing children, even though each child may require vastly different sets of tests, communication modalities, languages used, and other critical features of the assessment process. Such a framework must be flexible and rational enough to fit the assessment and intervention needs of a very heterogeneous population with the demographic characteristics of the diverse general American population (Metz, M. Miller, & Thomas-Presswood, 2010), plus be able to address considerations related to age of onset of hearing loss, age of identification and intervention, extent of loss, parental educational levels, need for visual accessibility of language, and presence of disabilities. The goal is to integrate and translate appropriate test data into meaningful intervention strategies and approaches. This can be done only if the assessment process is intentionally crafted to be able to elicit and demonstrate the maximum skill attainment levels in all pertinent areas of development.

According to M. Miller (2006), one of the initial—and primary—challenges in formulating an assessment framework is to address the question of whether there should be a prototypical or “ideal” deaf child as a referent for normal development. Such a child would have no developmental disabilities and would have had an enriched environment, both linguistically and socioemotionally, from birth. Frequently, assessment specialists have in mind a nondisabled deaf child of nondisabled deaf parents who are well educated. Hypothetically, this child would be enrolled in a program with professionals trained in deaf education and related areas in which a rich linguistic and intellectually rigorous environment is available and fully accessible to the deaf child. This prototypical deaf child may serve as the model for normal development and for the establishment of developmental milestones. Other deaf children may be compared with this “ideal” model and measured according to how much their development deviates from this model, both positively (higher-than-expected performance) and negatively (lower-than-expected performance). With the growth of universal neonatal screening, it is possible that more and more deaf children without disabilities who are born to hearing parents, who are identified early, and who have early and appropriate family and child programming will follow the same developmental trajectories as deaf children without disabilities whose parents are deaf.

The second stage in formulating an assessment framework is to account for demographic variables. We have already mentioned major ones such as age at onset of hearing loss, extent of hearing loss, age and appropriateness of educational interventions, presence or absence of disabling conditions, and audiological status of parents (i.e., having deaf parents may often make the communication and linguistic access more readily available, thus enhancing the development of a deaf child). Other variables include the linguistic environment of the home, the use of technology, such as cochlear implants or hearing aids, the number of years a child has been using a current

communication approach in school and at home (i.e., if a child has recently learned to use ASL, he or she may not yet be proficient in that language, etc.), and the number of changes, if any, in languages used or communication approaches. Considering such variables, both internal to the child and external, a competent assessment specialist not only should be able to differentiate “deaf only” children from “deaf and disabled” children (M. Miller, 2006) but also should be able to identify within each group those who have received excellent programming from an early age as opposed to those who have received insufficient or ineffective services.

In considering the prototypical deaf child, one with deaf parents who is exposed to ASL from birth, we must point out that deaf children of deaf parents constitute a minority of the deaf population. There has been a common assumption that they represent approximately 10% of the school-age deaf population. A review of research by Mitchell and Karchmer (2004) indicates that 10% represents an overestimate and that the real incidence in the United States is around 4%. Given the small numbers, a second guiding template or prototypical model must be established, that of a typical deaf child with no disabilities and with a somewhat “typical” life experience with hearing parents (M. Miller, 2006), thus taking into account incomplete access to language stimulation, at least in the early years, when assessing overall development. This assessment framework will assist in determining if the child is developing appropriately, given a diminished amount of early language and conceptual access, or if the developmental pattern is more indicative of a disability in addition to deafness. If recent developments in neonatal screening and appropriate infant and family intervention are successful, the assessment framework will change because no allowance will need to be made for the lack of adequate exposure to language and concepts as more and more hearing parents and the educational programs are able to meet the early learning needs of deaf children. The template for development of deaf children of deaf parents will then become the predominant model to be used for comparing the development of all deaf children without disabilities with what is expected.

Norms and Assessment

There are norm-referenced and criterion-referenced tests in most areas of assessment—educational achievement, intelligence, social-emotional, vocational, and so forth. In criterion-referenced tests, sets of skills or behaviors are measured and the test-taker is assessed according to the requirements of the test. There is no direct comparison with other individuals or groups. The standardized state-developed and -administered tests mandated by the No Child Left Behind Act of 2001 (2002) are examples of criterion-referenced tests. Most deaf and hard of hearing students, unless they have significant disabilities, are expected to take the standardized state-mandated tests, sometimes with accommodations, depending on the regulations established by individual states. Deaf and hard of hearing students are not directly compared with scores of other students, but rather with standards of learning established by the states for the academic achievement areas.

Norm-referenced tests have been in existence for more than a century, with the best-known example being IQ tests, which grew out of the efforts of Henri Binet around

the beginning of the 20th century. Binet developed a test of intelligence to identify children in the public schools of Paris who would not benefit from regular educational instruction and would be better served in separate educational environments (Hale & Fiorello, 2004; Moores, 2001). Terman (1916) built on Binet's work by developing a scoring system that produced an "intelligence quotient," or IQ. Since then, literally thousands of norm-referenced tests have been developed. In the assessment of children, norm-referenced tests compare the performance of a particular child with a sample of children considered representative of the school-age population or of certain aspects of the school-age population. Typically, the child receives a standard score relative to the reference group or normative sample, providing a measure of where the child falls along a continuum of the attainment or development level relative to a comparable peer group. This can also be stated in terms of percentiles—for example, a child's test performance falling within the 70th percentile indicates that the child performed as well as or better than 70% of the normative sample.

For deaf and hard of hearing children, the questions regarding norm-referenced testing are (a) what, in essence, constitutes a comparable peer group and (b) does an appropriate peer group vary according to the type of testing being conducted or the relevant characteristics of the child? For most tests, the normative sample consists of hearing children. Braden (1994) argues that this may be acceptable from a practical perspective in many cases, but in other cases, it may be inappropriate. Also, in many instances, test accommodations are made and standard scores are reported for deaf test-takers, with test accommodations or adaptations described in the report and limitations placed on the confidence with which the results can be applied. However, the relative standing within in the normative group reflected by the standard score may not reflect the true relative position of that individual if he or she received accommodations or if the test itself was adapted and standardized administrations altered. Smith (2002, p. 75) states, "Modifications in test stimuli, test procedures, or response format may reduce the meaningfulness of the test norms because norm-referenced tests are based on the assumption that the same stimuli were administered in the same way to all examinees." Norms may be used at times, but they should be used with the utmost caution, and these issues must be addressed in the report.

In addition to judicious use of the norms provided by the test developers, who mostly are individuals who hear, M. Miller (2006) advocates for the development of norms, when appropriate, for at least three distinct subgroups of deaf children: (a) deaf children with no disabling conditions, (b) deaf children with disabling conditions, and (c) a combined group for all deaf children. There is a caveat for the third group. Most assessment tests for hearing children do not include children identified as disabled, although it is clear that a certain, probably small, number of children with undiagnosed disabilities will be included in any large-scale normative sample. In some cases, a small number of children with disabilities will intentionally be included in the normative sample to reflect the small incidence of disabilities in the school-age population. The large number of deaf and hard of hearing children with disabilities in any sample could make interpretation of results more complex. For example, the performance of a deaf child with no additional disabilities might appear to be relatively high when compared with a complete sample, but average or below average when compared with deaf children without disabilities.

The assessment situation for deaf and hard of hearing children with severe to profound disabilities is problematic. This would include conditions such as deaf-blindness, deaf and autistic, deaf and severely emotionally disturbed, and deaf with pervasive developmental disabilities. First, the number of children with any one of these conditions is quite small. Second, as pointed out by Jones, Jones, and Ewing (2006), these children vary from each other more than the variation expected in any other deaf normative group.

Summary

This text is designed for professionals with responsibility for psychological, psycho-educational, and neuropsychological assessment of deaf and hard of hearing children and youth. It is not a list of tests, although tests are addressed, sometimes in detail. However, it is our contention that tests are part of a complex process of assessment organized and conducted by an experienced, sensitive, and skilled practitioner. We perceive assessment of deaf individuals as both a science and an art. Exciting new possibilities are opening up, and we see great benefits for deaf and hard of hearing children and youth.

Deaf and hard of hearing children constitute a highly diverse, yet low-incidence population with unique learning needs and styles, especially in the areas of language and communication. Assessment frequently is complicated by difficulties in assessing discrete developmental areas with the tests and lack of consistent adaptations with measured validity and reliability findings. Demographic characteristics such as the age of onset, the severity of hearing loss, the age of identification and provision of appropriate services, the ability of parents to communicate with the child, and the presence of coexisting conditions further complicate the development and standardization of the assessment process for deaf and hard of hearing children in a meaningful way. Professionals in the fields of school psychology and the specialization of school neuropsychology, clinical psychology, and neuropsychology have the potential to make significant contributions to the assessment of deaf and hard of hearing children, the development of test-adaptation guidelines and test protocols to fit the needs of widely differing development patterns, the establishment of effective interventions, and the monitoring of progress. We are just starting to develop meaningful conversations about very difficult issues. This text is a part of that conversation.

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