Abstract

This article discusses issues involved in psychological assessment of children with hearing loss who have additional disabilities or special needs. It provides recommendations for appropriate methods of assessment that accommodate the communication difficulties associated with hearing loss. This article includes assessment procedures for children who have cognitive disabilities, learning disabilities, visual impairments, attention deficits (ADHD), autism, sensory integration dysfunction, emotional and behavioral difficulties, and motor disabilities.

Introduction

An estimated 40% of children with hearing loss have additional impairments that can affect education and adaptive development (Gallaudet Research Institute, 2003). These children should have comprehensive psychological assessments for several reasons. First, parents and educators require an accurate understanding of the child’s cognitive abilities to develop appropriate expectations and goals based upon standardized methods of assessment. Second, an accurate differential diagnosis of the child’s impairments provides guidance in design of educational and treatment programs, and provides a prognosis for long-term planning. Third, parents and medical staff know the child’s level of comprehension to determine the child’s ability to participate in decisions and to cooperate with procedures (e.g., the cochlear implant process). Fourth, suspected behavioral or emotional problems require adequate assessment to ascertain what impairments may interfere with educational programs and development of adaptive behaviors. Finally, a comprehensive psychological assessment can determine appropriate methods to adapt instruction and therapy to the specific abilities of a child who has cognitive, behavioral, or emotional differences.

Assessment of Cognitive Functioning

In the general population, 2% to 3% of children are mentally retarded, as defined by significant limitations in intellectual functioning and adaptive behavior (AAMR, 2002). A survey of school-aged children with hearing loss reported that approximately 9.3% have mental retardation (Gallaudet Research Institute, 2003). In addition, the survey indicated that another 10.2% are identified with learning disabilities. Of the approximately 50% of children who had a known etiology for their hearing loss, nearly 30% had hearing loss associated with problems during pregnancy or with postnatal injury. These conditions include cytomegalovirus (CMV), rubella, trauma associated with premature birth, meningitis, and ototoxic medications. Many of these etiologies are also associated with central nervous system (CNS) damage implicated in mental retardation and learning disabilities. Because children who are deaf or hard of hearing are at high risk for learning problems, it is important to provide them with appropriate cognitive assessment.

There are several reasons for intelligence testing of these children:
- to provide a standardized method of cognitive assessment;
- to derive a differential diagnosis;
- to advise families about a prognosis;
It is important to use standardized instruments to assess children who are deaf or hard of hearing so that their performance can be compared with the cognitive performance of children with normal hearing of their own age. When non-standardized methods of estimating a child's ability are used, there is the potential to over or underestimate the child's abilities. Often informal assessments are dependent on communicative interaction. Shy, apprehensive children may not show their best intellectual skills in this situation. On the other hand, sometimes children are socially engaging, initiating communication with adults, and amicably interacting with others. These children's cognitive skills are sometimes overestimated by informal methods, because of their friendliness. Educators sometimes describe these children as “bright,” but geniality is not synonymous with formal cognitive skills. Prognosis is enhanced by accurate assessment of intelligence.

Differential diagnosis is often predicated upon knowledge of a child’s cognitive ability. For example, both attention deficits (ADHD) and autism are diagnosed by behavioral observations. In making these diagnoses, one needs to interpret a child’s behaviors, such as short attention span or restricted play, in the context of the child’s ability level. By assessing the child’s cognitive ability, one can then interpret the meaning and significance of certain behaviors.

Families frequently have questions and concerns about their child’s prognosis, even from an early age. With children with special needs, parents’ questions often center on issues of independence. One must be cautious about predicting adult cognition from a single intellectual evaluation of a child. However, with two or more evaluations over several years, one can usually discern the rate of cognitive development that is predictive of the child’s intellectual course. This can be helpful in guiding discussions with parents regarding probable adult prognosis.

Progress in educational and therapy programs is often correlated with intellectual level. A child’s ability to comprehend abstract information and to process new information can be predicted from intellectual tests. Acquisition of adaptive behaviors can be estimated by intellectual abilities. For example, realistic expectations for learning self-care skills depend on the child’s cognitive capacity. In addition, behavior management programs should be based on an understanding of the child’s cognition. A child with a mental level of 2 years old is unlikely to understand a sticker chart or token system for behavior management.

The traditional method of cognitive assessment emphasizes language processing. With children who are deaf or hard of hearing, one must be cautious of assessing cognitive functioning by using formal measures of language-based processing and reasoning. Traditional intelligence tests are language dependent, with both the content of the assessment instrument and the method of assessment requiring language processing. For example, the content of an instrument may include an expressive or receptive vocabulary task. The method can be language dependent, such as giving verbal directions to a child, even if the child’s response is nonverbal. Because many children with hearing loss have delays in language development, one must be cautious about ever using a standardized, language-based assessment procedure to determine cognitive ability. If the child does poorly on language-based measures, one cannot easily differentiate if poor performance was due to fundamental cognitive deficits, or if poor performance was due to difficulty discerning the language signal or processing the linguistic information.

For children whose primary mode of communication is sign language, some psychologists may be tempted to translate verbal tests and directions into sign language. This is a poor procedure. Sign language is not an exact equivalent of orally presented language, and use of a sign translation is likely to invalidate the standardization of the test procedures. One problem is the iconicity of signs. The visual image of a sign may give cues to a child that are not available in the verbal presentation of the standardized version of a test. For example, on the Vocabulary subtest of the Wechsler Intelligence Scale for Children (WISC-III), a child is asked to define “hat.” If the stimulus is signed, the child can simply describe the iconic gesture of the sign (on top of head) and receive points for the definition. This simple description of an act occurring in front of the child is not the same type of processing that the vocabulary subtest presumably measures.

Prior to assessing a child who is deaf or hard of hearing, a psychologist should expect that the child might have difficulties with processing of language-based information, which can pose a problem of both administration and interpretation of
standardized instruments. It is probably better to let audiologists, speech-language pathologists, and teachers of the deaf or hard of hearing assess and describe the abilities and limitations of auditory processing and language development. The psychologist can better serve the child by focusing on a refined assessment of nonverbal cognitive processes. Differential diagnosis often depends on an accurate and complete assessment of a child’s cognitive ability. For example, if one attempts to differentially diagnose communication impairment versus mental retardation in a young child, an intelligence test that is verbal in nature is unlikely to assist in the diagnosis. Children with hearing loss and/or mental retardation will both perform poorly on a verbal measure. However, if a nonverbal measure is used, the child with hearing loss will typically perform within an average range compared with peer norms, while the child with retardation will show an impaired performance.

Mental retardation is defined as below average functioning in both objectively assessed cognitive skills and in developmental/adaptive behaviors. Standardized measures of adaptive behaviors usually have a variety of scales measuring motor skills, self-help skills, social skills, and communication skills. For the same reasons one needs to be cautious with verbal intellectual measures, one must be cautious in interpreting adaptive measure scales that either primarily focus on communication (expressive and receptive language), or rely upon communication skills as an important component (socialization). One can examine a profile of scaled scores to determine if the profile of the child with hearing loss represents a mental retardation pattern. Children with hearing loss who have average nonverbal cognitive abilities usually show a pattern in which scales of motor skills and self-help skills are within an average range, while measures of language skills may be low. Usually, a measure of social interaction is somewhere in between. In contrast, the typical profile of a child who is mentally retarded with hearing loss will often show all scaled scores in a below average range.

As noted above, the method of administering a cognitive measure may be language dependent, even if the task itself is presumably not. For example, the WPPSI-III and the Stanford-Binet have nonverbal subtests, but an examiner frequently has difficulty communicating adequately with a young child so that the child with hearing loss comprehends how they are to respond on the task. This difficulty in comprehending instructions invalidates the standardized administration of the test. In contrast, older children who are deaf or hard of hearing seem to quickly comprehend the task procedures for the nonverbal (Performance) subtests of the WISC-III, and the examiner can adequately communicate instructions with some simple gestures.

For this reason, one must be thoughtful in choosing appropriate nonverbal cognitive measures. For very young children, less than 2½ years of age, there is no reliable measure that can yield a nonverbal IQ score. The most valid measure of cognitive functioning for children of this age is the Bayley Mental Scale. Although one cannot derive a nonverbal IQ score, one can get a nonverbal age range by administering the nonverbal measures and plotting passes and failures on the scoring sheet.

In the pre-school-aged range, several instruments are reliable. The primary challenge in this age range is to engage the child in the assessment procedure. The CID Pre-school Performance Scale (PPS) is an excellent measure of nonverbal cognition. Young nonverbal children quickly comprehend the task demands and are usually interested in the tasks that appear from different boxes. The majority of items are the same on the Merrill-Palmer Scale of Mental Tests. The instrument has a standardized procedure for scoring if some items are omitted. One can omit several nonverbal items and score the remaining nonverbal items in the standard manner. The resulting IQ and age-equivalent scores are then based on nonverbal cognitive functioning. The norms for the Merrill–Palmer are quite old, and psychologists are therefore reluctant to use them because of concerns about validity. However, the old Merrill–Palmer norms correlate quite closely with the PPS norms when both instruments have been administered to children concurrently. There is only a two point IQ score difference between the two measures when they are administered in the same session.

The Leiter-R has norms that are more current and can be administered to children from 2-20 years of age. It has the advantage of minimizing physical manipulation of objects and it is untimed. Therefore, if a child has significant coordination problems, or has some attending difficulties that may contaminate timed administration, then the Leiter-R is a good alternative to the PPS. However, the Leiter-R is difficult to administer to children under the age of 3½ years. The tasks and materials are not as appealing as the tasks from the PPS. It is difficult, too, for
young children who are mentally retarded for the same reasons. If children have difficulty establishing responses to the Leiter-R, one can switch to the first edition of the Leiter. The response format is somewhat different, in that the child is more engaged in manipulating picture blocks and fitting them into a tray. Children who are mentally retarded and children with autism sometimes will show more interest in responding on these materials, rather than more simple picture pointing and placement from the Leiter-R. Although the norms from the first edition of the Leiter are older, they still give a reasonable estimate of cognitive functioning in order to discriminate average from below average cognitive functioning.

By the age of 6 years, several nonverbal measures are appropriate for cognitive assessment of children who are deaf or hard of hearing. These include the Leiter-R, the performance section of the WISC-III, the nonverbal section of the Kaufman Assessment Battery for Children (K-ABC), and other measures including the Universal Nonverbal Intelligence Test (UNIT). Other nonverbal cognitive measures offer variations of these standard measures, such as the Test of Nonverbal Intelligence (TONI) and the Raven’s Progressive Matrices. Most measures of nonverbal intelligence at this level usually include a pattern construction task and/or a picture analogies task. Pattern construction and picture analogies are two of the most proven and robust measures of nonverbal cognitive abilities in children.

Sometimes the issue of an “un-testable” child comes up in assessment of children with multiple impairments. Most problems here either involve the choice of assessment instrument or the child’s behaviors. Many of the “un-testable” situations can be resolved if the examiner chooses an instrument that starts low enough to engage in the child in simple responses within the child’s capacity for response. The psychologist may not have simplified the assessment tasks to facilitate a successful range of responses from the child. If the child appears to have significant intellectual impairment, the examiner can start by first doing a play observation. The child’s interaction with toys in free play serves as a guide to choosing an assessment instrument. For example, if the child shows some features of representative or pretend play, the child has the ability to respond on a preschool test. However, if the child engages in primarily sensorimotor play, the examiner may choose to start with items from an infant scale, such as the Bayley. Sometimes it is better to underestimate a child’s ability rather than to overestimate it. By using easy tasks, the examiner can establish rapport and a rhythm of interaction with the child, and then switch over to the next higher level of test.

Sometimes the child’s behavior may interfere with sustained cooperation with testing. For example, if a child has a short attention span or is impulsive, tasks that require pointing at pictures and placing cards (e.g., Leiter-R) may not keep the child engaged. In contrast, a test with more manipulative items and shorter duration of tasks (e.g., PPS) can maintain the child’s interaction. In another example, a child with autism will likely not want to do tests that require much joint attention or imitation with the example. However, one can still obtain a reasonable estimate of cognitive functioning by using an alternative assessment instrument that minimizes such interaction. With younger children with autism, it is difficult to initiate or sustain interaction with the Leiter-R. However, they often work quite well on the first edition of the Leiter, which has a different response format, requiring less interaction with the examiner.

Assessment of Learning Disabilities

Discussing the concept of a learning disability within the context of hearing loss is complex, because the hearing impairment itself can create a specific learning difficulty associated with language and literacy. There are two ways to think about a learning disability. One is from the standpoint of a cognitive assessment. A child with learning disabilities has a specific contrast of strengths and weaknesses in learning, reasoning, and processing abilities. The child should demonstrate near average abilities in some areas of cognition, in contrast to significant deficiencies in other specified areas. This is different from a child with mental retardation, who shows more universal and severe deficiencies in most areas of cognitive functioning.

A second way of defining learning disability is by guidelines, often based on a profile of test scores, and specifically defined by an educational agency, such as a state department of education. In this second definition, a child often has to show a discrepancy between assessed cognitive “ability” (i.e., an IQ test) and assessed educational “achievement” (e.g., achievement tests). Furthermore, the discrepancy cannot be explained by a physical impairment, such as hearing loss. This institutional definition adds complexity to the issue of learning disability and hearing loss.
Hearing loss can cause learning problems associated with language processing that will affect oral communication as well as reading literacy. Many children with hearing loss show reading levels significantly below average for their age and grade placement, even though they have average cognitive (nonverbal) abilities. By educational guidelines, this discrepancy between ability and learning cannot be defined as a learning disability because it is presumably caused by a physical impairment. However, in the context of the first definition of learning disability, such children clearly show a mismatch between nonverbal cognitive functioning and language-based skills. Although these children do not meet school criteria for a learning disability, they function in a similar manner. Most dyslexia is a language-based phenomenon and not a difficulty caused by visual processing problems. Children who are deaf or hard of hearing may have problems with phonetic decoding of words, with comprehension of syntax, and with word recognition and fluency (because of a limited vocabulary base).

To assess literacy problems in children who are deaf or hard of hearing, a psychologist serves the child best by working through a team approach. The psychologist can assess nonverbal cognitive functioning. A teacher of the deaf and hard of hearing or a speech-language pathologist, who is experienced with children with hearing loss, can assess language functioning, including comprehension, syntax, and vocabulary, as well as assessing oral-auditory skills such as phonetic discrimination. A teacher of the deaf and hard of hearing can also provide an assessment of reading skills in the mode of communication most commonly used by the hearing child who is deaf or hard of hearing.

In addition to the standardized intelligence tests, the psychologist can use some specialized tests to assess memory and other processing skills. The visual processing subtests from the Wide Range Assessment of Memory and Learning (WRAML) work quite well with children who are deaf or hard of hearing to assess learning, memory, and processing skills. The nonverbal memory subtests from the K-ABC also prove to be good measures of memory span as well as processing ability. On the K-ABC, children who are deaf or hard of hearing usually perform within an average range on the subtest of spatial memory, which requires them to remember where in 2-dimensional space they observe objects. In contrast, many children who are deaf or hard of hearing have difficulty on a measure of hand movements, in which they have to memorize a sequence of hand gestures. This presumably visual task of sequencing a series of hand gestures is difficult for children who are deaf or hard of hearing, even if their primary mode of communication is sign language. These same children have related difficulties in reading comprehension and writing tasks. The contrast between spatial memory and hand movements may signal difficulties in encoding sequentially-based information.

An exceedingly difficult task is identification of a specific language impairment that co-occurs with the hearing loss. Specific language impairment, also known as a developmental language disorder, occurs in about 6%-8% of children (Leonard, 1998). It usually can be identified in assessment by a significant discrepancy between verbal and nonverbal processing abilities. However, one can expect that children who are deaf or hard of hearing will usually show such a discrepancy by virtue of their auditory processing difficulties. As noted above, their function is if they have an acquired learning disability by virtue of their limitations of auditory learning and resultant language/literacy delays. Yet, one should expect that if 6%-8% of children show a congenital language disorder, then some children with hearing loss could also have this as a co-occurring condition. Yet our traditional methods of maneuvering the contrasts out are not too helpful in this situation. This presents the difficulty of assessing an “aphasic” condition that is different from the experiential deficits caused by the hearing loss.

When confronted with this daunting task, the psychologist needs to work with the special educators. An experienced teacher of the deaf and hard of hearing or a speech-language pathologist can report if the child’s rate of language learning is typical or atypical for similar children who are deaf or hard hearing. One must control for many features here, including nonverbal cognitive abilities.

Assessment of Children with Hearing Loss and Vision Loss

The Gallaudet survey indicated that 1.6% of children with hearing loss were also classified as legally blind and 2.8% as having low vision (Gallaudet Research Institute, 2003). Although several thousand children across the nation are classified as “deaf-blind,” this term is somewhat misleading in that these children may have a range of both hearing and vision deficits that allows them to
use some residual hearing or vision to help function, although
at a limited level. This is important, in that assessment of these
children can use some auditory and visual stimuli, appropriately
adjusted for the individual child’s communication abilities.
Furthermore, over half of the children who are deaf-blind have
other major developmental disabilities, with mental retardation
being the most common (Tedder, Warden, & Sikka, 1993).

The range of visual and auditory deficits, as well as the common
presence of mental retardation and other disabilities, indicates
that the “deaf-blind” population of children is quite heterogeneous
in an assessment context. Mar (2003) has cautioned that most
standardized psychological tests are inappropriate in use with
this population of children, and one must be cautious in adapting
tests that were developed for children who have normal hearing
and vision. Therefore, specialized procedures uniquely developed
for this population are the most valid and reliable measures of
functional ability.

Children who are deaf-blind have significant impairment of two
primary sensory modalities used in communication, and many of
them are also mentally retarded. Therefore, the majority of these
children at a young age are prelinguistic in their communication
development. Early assessment should focus on development,
learning, and use of functional communication skills. The Callier-
Azusa Scale (CAS) is a developmental assessment tool devised
described the Communication Observation Schedule (COS) they
have designed to assess the functional use of communication by
children who are deaf-blind. Finn and Fewell (1994) reported on
the efficacy of the Play Assessment Scale (PAS) with children
who are deaf-blind. They found that early play behaviors, in the
2-36 month range for children who are developing normally,
works well in assessment of children who are deaf-blind. They
correlated the play behaviors with three measures specifically used
to assess children who are deaf-blind. The measures used were the
CAS, the Wisconsin Behavior Rating Scale (developmental skills),
and the Gestural Approach to Thought and Expression (nonverbal
communication).

As children who are deaf-blind develop communication, they
can use a variety of communication modes. These include voice,
gestures, sign language, Braille, and augmentative devices such
as electronic systems, picture books, communication boards
(Mar, 2003; Tedder et al., 1993). The above listed assessment
procedures are designed to assess the child’s functional
communication capacity with these different modalities. When
the children have developed a reliable system of communication,
a psychologist can examine cognitive skills by communicating
with the child through the preferred mode of communication.
Some standard materials can be adapted by using larger visual
displays, translating queries or responses, or using some carefully
controlled auditory information within the child’s acuity level. A
practical approach to meaningful assessment should focus on
functional abilities to communicate and learn new information.
Working with a team of special educators who are experienced
with children who are deaf-blind, a psychologist can develop a
valid method of assessment of cognitive abilities. However, as Mar
cautions, psychological assessment of such children is difficult.
A psychologist who does not routinely work with this population
should be well versed on alternative methods for assessment. If
not, the children are much better served by referral to specialists
who have developed an expertise in assessment of children who
are deaf-blind. Many state educational agencies have specialists
or referral sources, through programs for the hearing impaired,
visually impaired, or severely mentally retarded.

Assessment of Attention-Deficit/Hyperactivity Disorder

Attention deficit hyperactivity disorder (ADHD) occurs in 3%
to 5% of the general childhood population (Barkley, 1998) and
in 6.6% of children with hearing loss. ADHD is diagnosed by
behavioral assessment, and DSM-IV criteria (Diagnostic and
Statistical Manual of Mental Disorders--4th Edition, American
Psychiatric Association, 1994) serve as the gold standard for
defining this disorder. ADHD is defined by symptoms of either
inattention or hyperactivity-impulsivity that are present before
7 years of age and persist for at least 6 months. These behaviors
must be severe enough to impair social or academic functioning.
Furthermore, symptoms need to be present in two or more
different settings.

Common settings for assessment of ADHD include the child’s
home, the school, and an examination by a psychologist. To
objectively assess the behaviors in different settings, most
psychologists use standardized behavior rating scales completed
by an adult familiar with the child in that particular setting.
Typically, parents will report on the home setting and the classroom teacher will report on classroom behavior. The usual standard is that on scales of inattention or hyperactivity, the child’s rated score should be within a clinical significant range (>95-98th percentile).

In diagnosing ADHD in children who are deaf or hard of hearing with multiple handicaps, one must consider two important variations. First, it is essential that the psychologist know the child’s level of cognitive functioning in order to accurately interpret behaviors. For example, the child may appear impulsive or inattentive during the psychological examination, but these behaviors may be consistent with the child’s overall developmental level. Similarly, if parents or teachers overestimate the child’s cognitive level, they may interpret physical activity or attention span in the context of the child’s chronological age, rather than in the context of the child’s mental age. With this overestimate, they may inflate their concerns about problem behaviors.

Second, many children who are deaf or hard of hearing are integrated into regular education classrooms. Within these settings, the regular education teacher often reports on the child’s behavior, either informally or by a behavior rating scale. In this context, the teacher may compare the behavior of the child who is deaf or hard of hearing to standards for children with normal hearing. For example, a child who is hard of hearing may be described as inattentive in a regular education classroom, but the problem of sustaining attention is not due to an inherent attention disorder, but rather to the difficulty attending to auditory cues in a classroom. The child may not sustain attention because of difficulty processing language information that is too complex for the child, or difficulty discerning the auditory signal in the noisy environment.

Given these two variations with children who are deaf or hard of hearing, the psychologist should develop a clear profile of the child’s disabilities, and how they may affect behaviors associated with attention and activity level. When there is such misinterpretation of a child’s behaviors, usually there are significant differences in rating behaviors among the home ratings, classroom ratings, and direct observations by the psychologist in an individual examination. Wide variation of behavior ratings for children with multiple disabilities is often a clue to misinterpretation of the behaviors based on various norms. If the variation includes ratings by a regular education teacher, the psychologist should seek additional ratings from specialists who work with children who are deaf or hard of hearing and children with other physical handicaps. This can include ratings from teachers of the deaf and hard of hearing, educational audiologists, and speech-language pathologists.

In the assessment of possible ADHD in a child who is deaf or hard of hearing with multiple handicaps, one should not be bound to a one-time assessment procedure. If ADHD is suspected by the psychologist, then assessment of the child can be ongoing with treatment serving a diagnostic purpose. Standard treatment protocol for ADHD is tripartite -- behavior interventions at home and school, counseling for parents and teachers, and a medication trial. If ADHD is suspected as a component problem for the child, all three treatment strategies can be implemented and monitored. There are specific behavior techniques that are helpful in modifying the problems associated with ADHD within the home and at school (Barkley, 1998). Associated with these are counseling for parents and teachers, so that they can understand the nature of ADHD, and develop a positive and effective attitude toward working with a child who has ADHD. If ADHD is suspected, the counseling and behavior training should be implemented to determine if the child’s behavior is responsive to these standard methods. In addition, a medication trial can often be arranged with a physician. Barkley reported that 50%-95% of ADHD children respond positively to stimulant medication. This medication is safe when appropriately prescribed and supervised by a physician. If the child’s suspected ADHD behaviors improve while on medication, and regress when the trial is suspended, this supports an ADHD diagnosis.
Assessment of Autistic Spectrum Disorders

Autistic spectrum disorders include autism, pervasive development disorder—not otherwise specified (PDD-NOS), Asperger syndrome, Rett syndrome, and Childhood Disintegrative Disorder. Autistic spectrum disorders have a prevalence rate in children of about 0.5% (Simms & Schum, 2000). The most common forms are autism and PDD-NOS. There are three core criteria for the diagnosis of autism:

• severe deficits in communication;
• severe deficits in social interaction;
• restricted and stereotyped patterns of behavior, interests, and activities.

In PDD-NOS, a combination of two or more of these categories is present, but do not meet the threshold for severity or breadth required for the diagnosis of autism (American Psychiatric Association, 1994).

Autism is diagnosed by behavioral assessment. DSM-IV lists a specific set of behavioral criteria, and there are checklists and rating scales for autistic behaviors. However, there is no rote formula for tallying behaviors and deriving a diagnosis of autism. Rather, one must interpret behaviors in the total context of the child’s experience and abilities. For example, approximately two-thirds of children with autism are also mentally retarded. Some people assume that behaviors, which are often manifested by children who are severely retarded, are unique to autism. A child who is severely retarded will have a limited repertoire of play behaviors. This limited repertoire of behaviors, such as repetitive manipulation of objects in sensorimotor play, can be misinterpreted as the restricted and repetitive behaviors of autism. In fact, compulsive behaviors are common in young children and are not unique to autism, with 40%-60% of young children who are normally developing demonstrating compulsive routines (Evans, Leckman, Carter, Reznick, Henshaw, and King, et al., 1997). Lord, Rutter, and LeCouteur (1994) have pointed out that compulsions and rituals that involve an end point are not autistic.

Because a key criterion of autism is a communication disorder, diagnosing this disorder in children with hearing loss must be done carefully. It is difficult to determine if the child is not communicating well because of the autistic disorder, or because of the experiential deficit due to the hearing loss. Furthermore, in the context of children who have multiple handicaps who are deaf or hard of hearing, many of them will be cognitively impaired. With this cognitive impairment, they will function at a below average developmental level, and therefore may show features of restricted and repetitive behaviors due to developmental delays rather than autistic preoccupation.

Assessment of social behaviors is a dependable method for differentiating autism from other disorders. All forms of autistic spectrum disorders, including PDD-NOS and Asperger syndrome, show disordered social interaction as a component of the disorder. Recent research has shown four key social behaviors that differentiate autistic spectrum children from other groups of children, including children who are developing normally, children with specific language impairment, and children who are mentally retarded:

• direct imitation
• joint attention
• representational and pretend play
• affective reciprocity

These four behavior features can all be demonstrated non-verbally by children who are deaf or hard of hearing with limited communication. One must interpret the child’s social behaviors in the context of their cognitive abilities. For example, a child with a mental age of 12 months will not show pretend or representational play. However, by 18 months the child may show early domestic mimicry. The doll task from the Bayley Mental Scale can assess this. The standardized version of this task is for a child to follow a verbal directive to use a spoon, comb, and tissue with the doll. However, in a non-standardized probe to screen for social behaviors in young, nonverbal children, one can give the child each of the three implements in the presence of the doll to see if the child uses these implements in a representational scheme. This is a quick and reasonably reliable method for assessing such social behavior and awareness in young children.

If a child who is deaf or hard of hearing demonstrates many or all of the four key social behaviors, it is unlikely that he or she has an autistic spectrum disorder.
Sensory Integration Dysfunction

With differential diagnosis of autism, the issue of sensory integration dysfunction often arises. Sensory integration (SI) is a theoretical model developed in the field of occupational therapy. Occupational therapists and other special educators often use this model to describe difficulties observed with children who have atypical development. SI problems are sometimes described as hyper- or hypo-sensitivity to stimuli. Some children are described as “craving” certain physical activities such as swinging, rocking, or deep pressure. Proponents of SI therapy claim that the therapeutic techniques are effective in treating behaviors associated with autism, mental retardation, and learning disabilities. Despite these claims, there is much scientific evidence indicating that SI therapy is of limited or no efficacy in these treatments, and, furthermore, that the hypothetical SI model is not validated (Cummins, 1991; Humphries, Wright, Snider, & McDougall, 1992; Wilson, Kaplan, Fellowes, Gruchy, & Faris, 1992; Hoehn & Baumeister, 1994; Siegel, 1996; Dawson & Watling, 2000; ASAT, 2003; Shaw, 2003).

In this context, one should not rely upon SI “behaviors” to substantiate a diagnosis of autism in children who are deaf or hard of hearing with multiple handicaps. Proponents of SI apply the model to a variety of developmental disorders, and therefore the SI behaviors are not considered unique to autism even among such proponents. Furthermore, there is no other credible evidence that indicates that SI-like behaviors are unique to autistic spectrum disorders. The core features for a diagnosis of autism are social and communication disorders, as well as restricted and repetitive behaviors. Formal diagnosis does not rely upon sensory processing difficulties.

Despite this warning about the questionable validity of the SI model, many clinicians recognize that young children with atypical development often show a cluster of behaviors that have sometimes been labeled as SI dysfunction. These behaviors include inconsistent hypersensitivity to external stimuli (e.g., sound, touch, movement, positioning), and sometimes a preference for active stimulation, usually involving movement (e.g., bouncing, swinging, brushing, deep pressure). There are alternative models to explain these behaviors that are more firmly grounded upon scientific examination.

Kagan’s research on temperament has shown that from infancy onward, there are certain children who have a low threshold of arousal to unfamiliar situations, which is manifested by distress, arousal, and anxiety symptoms (Kagan, 1997; Kagan, Snidman, & Arcus, et al., 1998). His research group has demonstrated that these infants who are highly reactive even show faster latency in evoked auditory responses, which suggests that this reaction may be related to the hypersensitivity to sound stimuli (Woodward, McManis, Kagan, Deldin, Snidman, Lewis, et al., 2001). Kagan has speculated that the infants who are highly reactive may develop symptoms of anxiety over time. It may be that the hypersensitivity described in SI dysfunction is actually a manifestation of this low threshold for arousal. These hypersensitive behaviors may be a manifestation of anxiety and high arousal. However, because these children cannot articulate their internal distress (i.e., anxiety), their behaviors are misidentified.

In a similar vein, the feature of “craving” motor activity may actually represent early manifestation of hyperactivity. Children with a diagnosis of ADHD show a pattern of sensory behaviors similar to those described by the SI dysfunction model (Dunn & Bennet, 2002). Pre-school-aged children with ADHD show a pattern of symptom behaviors similar to those shown by older ADHD children (Wilens et al., 2002). ADHD children often crave physical activity and motion, as well as novel stimuli. It may be that these incipient signs of ADHD in children with atypical development have been misinterpreted as SI phenomena.

In short, the model of SI dysfunction is of questionable validity. However, the behavioral phenomena recognized by many clinicians, and probably misattributed to SI dysfunction, actually exist. It may be that these behavioral displays suggest alternative problems of either anxiety or ADHD. A psychologist evaluating young children with multiple handicaps should keep these hypotheses in mind. Whether or not one accepts the hypothetical model of SI dysfunction, there is clear evidence that these behaviors are not unique or specific to autistic spectrum disorders, but rather may be manifested by children with a variety of disabilities.
Assessment of Emotional and Behavioral Problems

Many years ago, Meadow (1976) reported a cluster of behavior problems shown by children with hearing loss that occur at a higher rate than by children in the general population. They include impulsiveness, immaturity, egocentricity, and absence of inner controls. It may be that such behavioral problems do not represent that presence of pathology, but rather represent a delay in positive development caused by limitations in communication (Schum, 1991). In this context, when evaluating children who are deaf or hard of hearing for behavioral and emotional problems, it is essential that a psychologist have a thorough understand of the child’s communication history and current level of communication functioning.

It is helpful to have a thorough language evaluation from a speech-language pathologist to describe the child’s level of language functioning. As a rough measure, one can use an age-equivalent score for communication as an index for social behavior. Many times, the child’s social behavior will be commensurate with their level of communication ability, rather than with their level of nonverbal cognitive ability (Schum, 2000). Furthermore, a good communication history can determine how functional the child’s communication has been with significant persons, particularly parents. This is important in understanding how effective communication has been in transmitting behavioral expectations and social knowledge (Schum, 1991).

In assessing emotional adjustment, a useful distinction can be made between children who have congenital hearing loss and those who have post-lingual acquired hearing losses. The congenital group of children usually does not show signs of depression or anger associated with the hearing loss. These children typically define their hearing loss as a “difference” from children with normal hearing levels. In contrast, children with acquired hearing loss are more likely to manifest depression or anger, because they truly have had a recognizable change in their physical abilities. This group is more likely to define their hearing impairment as a “loss.”

In assessing emotions problems, clinicians should be cautious using any type of self-reports or projective techniques that depend upon language facility to diagnose emotional problems (e.g., questionnaires, Thematic Apperception Test (TAT), Rorschach). Because of communication difficulties, including frequent delays and disorders of language, responses from children who are deaf or hard of hearing cannot be reliably compared to norms developed for children. Self-report inventories are often written at a reading level too high for many children who are deaf or hard of hearing to reliably comprehend. Responses to projective techniques may often seem impoverished and stilted, but this may reflect communication difficulties rather than internally mediated pathology. Given this confounding problem of communication, it is more reasonable to focus assessment upon observable behaviors, as well as on informal self-reports from children who use their preferred mode of communication.

Cognitive Assessment and Significant Motor Impairment

Cognitive assessment of children who are deaf or hard of hearing with significant motor problems creates particular problems. As noted above, a valid cognitive assessment with children who are deaf or hard of hearing should emphasize use of nonverbal measures. However, many such measures require some hand dexterity to solve problems, such as block construction tasks or drawing figures. For most children at or above 3 years of age, the Leiter-R is the preferred method for cognitive assessment. It has been designed to minimize responses that depend upon hand dexterity. The standard response format is to place picture cards in a tray. However, the test has valid alternative procedures that include pointing to pictures or signaling a choice with an eye gaze. It can also be modified by having the child indicate “yes/no” as the examiner points to each picture choice. The response options for the Leiter-R are quite robust and have successfully been used with children who are quadriplegic.

Summary

Psychological assessment of children who are deaf or hard of hearing with multiple handicaps should usually start with a valid assessment of cognitive functioning. Knowledge of the child’s cognitive abilities sets the context for interpretation of suspicious behaviors, particularly those that might be associated with atypical development. Reliable assessment using standardized instruments should emphasize nonverbal procedures, or behavioral observations and reports that minimize misinterpretations due to communication difficulties. If psychologists wish to use norms from standardized instruments, they should avoid procedures confounded by communication difficulties.
Functional communication and language proficiency should also be part of a comprehensive evaluation. However, one should be cautious in using standardized assessment procedures that are based upon verbal communication. Translating the protocol, or the directions, into a different mode of communication will often violate the assumptions of the standardization process. One can use language-based procedures as clinical probes, but they should be interpreted in a qualitative, rather than a quantitative, manner.

Finally, a thorough psychological assessment of a child with multiple disabilities is best done in the context of a multidisciplinary team. A speech-language pathologist, teacher of the deaf and hard of hearing, educational audiologist, and other professionals can provide critical information for the psychologist regarding communication abilities, learning style, academic history, and special norms related to hearing loss and other specialized disabilities. By using specialized adaptations in procedures, and by coordinating assessment with other professionals, the psychologist can provide an optimum assessment for these children and their parents.

Source: The Volta Review, 2004