Have you ever heard a colleague say to parents, “I am sorry, but we can’t test auditory processing because your child is not yet seven years old”? Have you ever wondered why we can’t assess auditory processing in children younger than seven or eight years? If you read guidelines and recommended procedures from our national professional associations, there is nothing in these documents that says children below age seven cannot be assessed for auditory processing. Additionally, early intervention is usually provided as soon as a problem is identified in a child. So why wait until children are seven or eight years of age to identify auditory processing problems? This question has bothered many parents and audiologists for a long time (Beck, 2002; Katz, 2005; Lucker, 2005; Bellis, 2014). School districts sometimes refuse to provide services for children who have auditory processing problems because they are younger than seven years of age. Even for children six years of age, some audiologists say they will only screen such children or evaluate them for auditory processing deficits in very special cases (Beck, 2002). But what rationale do they provide to support the assertion that children under the age of seven cannot be identified as having problems processing what they hear? Below is a review of what the professional literature says regarding testing young children for auditory processing.

Many audiologists believe that it is not possible to assess auditory processing in young children, but the literature of our professional associations does not support this belief. Testing young children is critical for early intervention and prevention of more serious problems.
The American Speech-Language-Hearing Association (ASHA) (2014) describes auditory processing disorder (referred to as APD) as “greater difficulty hearing and understanding speech even though no measurable hearing loss exists. Individuals with auditory processing disorders may act as though a hearing loss is present when, in fact, hearing sensitivity is often within normal limits.” Any audiologist working with the pediatric population would recognize that we can determine normal hearing for children less than seven years of age. Children may act as if they are hard of hearing while their audiological evaluation reveals their hearing to be within normal limits (such as thresholds no greater than 15 dBHL at any frequency). If we can measure hearing in children under seven years of age, why can’t we assess auditory processing abilities in these children?

As part of the routine audiological testing for children of any age, the audiologist may ask the child to repeat words. We often refer to this as the word discrimination or word recognition measure. Typically, the test is performed in quiet. Yet some audiologists routinely complete such testing in both quiet and noise. The level of noise may vary so that some audiologists use a signal-to-noise ratio of +5, while others use +10 or some different value. But the comparison of performance for word recognition in quiet and noise is a measure of the child’s auditory processing abilities in a difficult listening situation. Thus, many audiologists actually measure auditory processing in children younger than seven years of age, even if only for some measures of auditory processing such as word recognition in quiet and noise. Additionally, when children have difficulty dealing with the speech-in-noise task, the audiologist may recommend some accommodation (such as the use of an FM system) or direct treatment services (such as speech-in-noise training). Therefore, the audiologist is providing the recommendations for early intervention, and most audiologists, and definitely parents and educators, would want early intervention for a child having problems in “real world” listening situations.

According to a technical report by the ASHA Working Group on Auditory Processing Disorders (2005), one of the earliest publications discussing the factor of age, auditory processing abilities (i.e., Beck, 2002). All audiologists should take care

This report encourages an individualized approach and mentions age as a factor when evaluating auditory processing, but it does not state that we cannot assess auditory processing in children below a specific age level. One must also consider mental age, such as in children with cognitive deficits:

The audiologist should be sensitive to the influences of mental age on test outcomes. When testing children below the mental age of 7 years, task difficulty and performance variability may act as if they are hard of hearing while their audiometric function and performance variability render questionable results on behavioral tests of central auditory function. However, exceptions to this general case may occur following careful examination of the task’s requirements and the child’s capabilities and when using tests specifically designed for use with younger populations. Informal assessment, including use of screening tools as well as periodic follow-up, is recommended when appropriate tests of central auditory function are not available for younger children or other difficult-to-test populations suspected of having (C)APD. (ASHA, 2005)

Nothing in this report prohibits testing children under the age of seven years, whether chronological age or mental age. The audiologist needs to understand that care should be taken in such cases, but testing young children is supported by these statements so long as appropriate measures are used and appropriate interpretation is applied. Indeed, for the sake of early intervention, we should test children as young as possible.

Another ASHA document (Bellis, 2014), authored by one of the members of the Working Group on Central Auditory Processing, states:

Most of the tests of APD require that a child be at least 7 or 8 years of age because the variability in brain function is so marked in younger children that test interpretation may not be possible.

The key word here is “may.” Any well-educated, well-rounded audiologist would know what responses, what behaviors, and what test performance for a child on any audiological measures are valid and reliable, or invalid and not reliable. This statement clearly does not prohibit testing children below seven years of age, although some have interpreted statements such as this to mean that brain development in children below seven years of age is not sufficient for the evaluation of auditory processing abilities (i.e., Beck, 2002). All audiologists should take care

Because of the individuality of brain organization and the conditions that affect such organization, (C)APD can affect individuals differently. Hence, an individual approach must be taken for the selection of diagnostic measures and the interpretation of results. Factors such as chronological age... can influence how a given person performs on behavioral tests.
in how they interpret hearing test findings in patients of any age. It is expected that diagnosis is based on the patient’s performance on duplicate measures in order to determine consistency of response so that reliability of performance can be judged, and it is expected that the audiologist insure that the child can readily and correctly perform practice items before stating that the child is able to take part in the actual test. Furthermore, it is hoped that the audiologist takes good notes of observations and reports deviations from expected performance for patients of every age. Thus, what is most important is that care be taken in conducting assessment of a child’s auditory functioning (including assessment of auditory processing) regardless of the child’s age.

What standardized tests reveal is that the number of correct test items (i.e., raw score) increases as the norms increase in age in order to obtain the same standard score, scaled score, percentile, or normal cutoff criterion reference measure. This continues until one reaches young adolescence. Then, around the age of 12 or 13 the norms tend to be about the same for these young adolescents as well as for adults. Thus, if we use a criterion that maturation of the brain occurs when the norms for children look the same as the norms for young adults, around 12 to 13 years the brain has developed a mature level of auditory processing abilities. Thus, one could conclude that the auditory parts of the brain do not mature until this age. Does that mean we should not assess auditory processing until children are 12 or 13 years of age? It is hoped that this would not be generally accepted. By that age of early adolescence, children who have auditory processing difficulties may also have negative emotional responses, poor self-esteem, poor self-image, and other negative factors present because of many frustrating

WHY WAIT UNTIL CHILDREN ARE SEVEN OR EIGHT YEARS OF AGE TO TEST FOR AUDITORY PROCESSING PROBLEMS?

The audiologist should never jump to a conclusion without supporting evidence. If a child 10 years of age is not able to perform the practice items on measures of dichotic listening, then such dichotic listening tests may not be appropriately interpreted as valid measures of the child’s auditory processing abilities. In contrast, a child of five years might well be able to complete the word recognition testing in quiet and noise as well as dichotic listening tasks. Thus, for this five year old, one can state whether speech understanding in noise and dichotic listening is or is not problematic, and if a problem, then a recommendation for accommodations and training to improve speech understanding in noise and auditory integrative processing may be appropriately made.

One argument that is often presented is that testing cannot be completed on children under seven or eight years of age because the brain is not fully developed relative to auditory processing by that age level. At one time, it was explained that we can look at the comparison of the norms for younger children and for adults in order to see at what age the brain has appropriately matured.
CHILDREN UNDER THE AGE OF SEVEN SHOULD BE TESTED SO LONG AS APPROPRIATE MEASURES ARE USED AND APPROPRIATE INTERPRETATION IS APPLIED.

years trying to figure out what people are saying to them. Again, our focus should be on early intervention as soon as the problem is identified.

Looking more carefully at the above mentioned ASHA documents, what is interesting to note is that most refer to making a diagnosis of auditory processing disorder (APD) at a young age. However, it is hoped that the reader realizes that the arguments discussed have to do with testing young children and merely providing a diagnosis of a disorder. What is being discussed is identifying problems children have in dealing successfully with auditory information as early as possible so that such difficulties do not interfere significantly with the child’s development, education, socialization, and development of self.

In addition to these ASHA publications, the American Academy of Audiology (Academy) clinical practice guideline Diagnosis, Treatment and Management of Children and Adults with Central Auditory Processing Disorder (Academy, 2010) states, “Factors such as age … can confound test results if these factors are not considered when determining candidacy for evaluation, test selection, and interpretation of test results.” Thus, again, this statement is interpreted to mean that care should be taken in testing, not that one cannot test a child of a certain age. Further:
Age is a primary consideration in the evaluation of children. Interpretation of results of behavioral measures of central auditory function in children under age 7 years (developmental age) is difficult. Normative data for behavioral measures of central auditory functioning are often limited or not available secondary to task complexity, maturational variability of the CANS, and the response demands of the task. (Academy, 2010)

Again, it is “difficult” to interpret test results for children under seven years of age because normative data are “often limited or not available” for children of that young age. Yet when considering that almost all of the standard behavioral measures used to assess auditory processing in children have norms down to five years of age, where does the age seven or eight years come into play? As all of the publications referenced indicate, care must be taken when choosing appropriate tests and measures to evaluate auditory processing abilities in children. This “care” should be taken not merely when testing young children but when testing anyone of any age. When evaluating auditory processing in the elderly, care must be taken to consider factors such as senility, Alzheimer’s, and other neural and mental conditions that could impact test taking behaviors, results, and interpretation. Thus, it is argued that if the audiologist takes care in his/her measures and knows how to interpret test findings relative to multiple factors including mental or cognitive abilities, emotional status, attention and self-regulation abilities, baseline measures that support whether the child can or cannot perform the task, and so on, then it should be possible to test children under seven or eight years of age for auditory processing.

The Academy (2010) document identifies some of the measures that do exist and that have norms for children well below seven years old. These measures include the Pediatric Speech Intelligibility Test (PSI; Jerger and Jerger, 1984), SCAN-3:C Test for Auditory Processing Disorders in Children (Keith, 2009), and the Staggered Spondaic Word Test (SSW; Katz, 1962). The document further states that “use of measures such as these, coupled with available behavioral checklists..., can provide insight into children who may be ‘at-risk’ for (C)APD, leading to recommendations for close monitoring of skills, enrichment activities designed to develop and augment auditory skills.” Thus, the Academy supports testing auditory processing in children under seven years of age if only for the purposes of identifying whether these children are having problems and can benefit from “enrichment activities designed to...
develop and augment auditory skills.” Thus, the “enrichment activities” would be the direct services or therapy that focuses on improvement (developing and augmenting) of listening (auditory) skills.

One might think that the focus of this article is the diagnosing of auditory processing disorder in children. This is not the case. In contrast, the purpose of assessing auditory processing is to identify what specific factors account for the presenting concerns related to listening and understanding auditory-verbal information. Most children referred for auditory processing testing come with a variety of complaints: difficulties “listening,” “problems processing what the child hears,” or “understanding what the child hears.” The application of the diagnostic label auditory processing disorder (APD) is useless when all that is provided by the audiologist is this diagnosis. The audiologist should look at the findings from the various measures of auditory processing in order to identify what specific factors are problematic and to identify the need for direct treatment services and specific individualized accommodations.

If we accept the belief that one cannot assess auditory processing in children below age seven or eight, we could be harming these children. The harm would be not providing early intervention services, direct treatment, and appropriate accommodations to younger children. This lack of provision of support services and treatment could lead to greater learning problems, increased frustration, decline in self-esteem, and feelings of failure. It is interesting to note that when one asks older children, adolescents, and adults who were identified with auditory processing problems at older ages (such as 11 years and older), they often state that until they learned they had an auditory processing disorder, they felt they were “dumb” or “stupid” and could not learn. This is reflected in the stories shared in the book Don’t You Get It? Living with Auditory Learning Disabilities (Edell et al, 2012).

What is needed is an increased awareness of what our professional associations are really saying about auditory processing assessment and support for testing young children who may have auditory processing difficulties. The conclusion is that both ASHA and the Academy support the evaluation of auditory processing in young children so long as the audiologist understands and is careful in make appropriate interpretations of the test results. Audiologists need to understand all of the factors that go into the processing of information we hear, that is, auditory processing. It is not merely sufficient to administer tests, score the tests, and state that the child passed or failed the tests and has an auditory processing disorder. Audiologists need to know how to look carefully at test behaviors and determine the validity and reliability of such measures regardless of the age of the person being evaluated. Only when the audiologist can explain why children are unable to appropriately process what is heard will these children be provided with appropriate services to help them succeed and overcome their auditory processing problems.

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References


Auditory Processing Abilities in Children: When to Test?


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