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Abstract

It is recommended that Auditory-Verbal clinicians working with children who are deaf or hard of hearing and their families use a battery of specific language tests when providing an early intervention program that focuses on language growth. These multiple measures should include norm- and criterion-referenced instruments that specifically measure lexical–semantic and morphosyntactic language as well as a parent questionnaire for examining global language. Tracking individual rates of receptive and expressive language growth as part of the recommended assessment protocol can effectively promote optimal language development as well as provide data for treatment efficacy research.

Introduction

The Auditory-Verbal approach is one of several oral communication options available to children with severe-to-profound hearing loss. Its basic premise is that children who are deaf or hard of hearing, with appropriately assertive use of advanced hearing technology and actively participating parents, can depend on their auditory sense for conversing in a natural manner and become educationally integrated with children who have normal hearing (Beebe, 1953; Fiedler, 1952; Griffiths, 1974; Huizing & Pollack, 1951). Research findings of the past decade indicate that the Auditory-Verbal option provides a highly viable communication mode for many children with severe-to-profound deafness (Duncan, 1999; Easterbrooks, O’Rourke, & Todd, 2000; Goldberg & Flexer, 1993; 2001; Rhoades, 2001; Rhoades & Chisolm, 2001; Rhoades & McCaffrey, under review in press; Robertson & Flexer, 1993; Wray, Flexer, & Guthrie, 2000; Wray, Flexer, & Vaccaro, 1997).

Given the recent growth of cochlear implant technology, there has been surging interest and concomitant growth of Auditory-Verbal therapeutic intervention. This is because the promise of hearing with relative ease is now afforded to children with severe-to-profound deafness. Therefore, it seems surprising that the issue of linguistic assessment within the Auditory-Verbal literature is sparse and incomplete (Estabrooks & Levasseur, 2001; Fitzpatrick, 2001; Pollack, Goldberg, & Caleffe-Schenck, 1997). This can unfortunately have a negative impact on future research studies. Despite both our a national mandate for all early intervention programs (Thurlow, 2001) and hearing health care recommendations (Jerger, Roeser, & Tobey, 2001), optimal assessment practice is not widespread among those programs serving our young children and their families (Bricker, 1996; Carney, 1996; Guralnick, 1991). Finally, there is the simple truth: Language development proceeds more rapidly during the first 3 years of life than at any other period in an individual’s lifetime (Costarides & Shulman, 1998). For “languageless” children (Ramey, 2000), then, the first 3 years of any auditory-based intervention are critical and must be well examined.

It is important to employ, at the minimum, a standard of practice
that prescribes appropriate, efficient, and systematic performance assessments that link assessment to effective intervention and decision making (McConnell, 2000; McLean, Bailey, & Wolery, 1996; Meisels, Xue, Bickel, Nicholson, & Atkins-Burnett, 2001; Merrell, 2001). Developing such an assessment and tracking standard therefore has significant implications for the shared knowledge base of Auditory-Verbal therapists as well as future auditory-based research. The purpose of this paper is to briefly review selected English-based language assessment literature and suggest a standard of practice for Auditory-Verbal clinicians.

Language evaluation within early intervention programs is clearly necessary for documentation of their beneficial impact on child development (e.g., Fewell, 2000; Sheehan & Keogh, 1982). Assessments should objectively describe children’s progress in language development so that efficacious plans can be developed for ongoing language intervention (Bricker & Littman, 1982; Levine, 1948; McLean et al., 1996). Ideally, language assessments should examine the young child’s command of spoken linguistic domains including phonology, morphology, semantics, syntax, and pragmatics as efficiently and as effectively as possible — in particular those of lexical–semantics and morphosyntax, the sine qua non of language (Pinker, 1994) and the focus of this position paper.

Norm-referenced tests, by virtue of the fact that they provide a comparison of individual performance to that of a large standardization sample, are designed to produce normally distributed scores, and are typically considered valid research tools. Some tests were designed specifically for children who are deaf or hard of hearing, two examples being the Grammatical Analysis of Elicited Language - Pre-Sentence Level (GAEL) (Moog, Kozak, & Geers, 1983) and the SKI*HI Language Development Scale (Watkins, 1979). While these tools are designed well, that is, normed on large groups of children and considered to be reliable and valid, they compare the children being tested only to other children who are also deaf or hard of hearing. In spite of some past researchers’ perspectives (e.g., Bricker & Littman, 1982; Levine, 1948), there does not appear to be justification for mainstreamed children to be measured with test instruments standardized on the deaf and hard of hearing population (Brackett, 1997; Rhoades & Chisolm, 2001).

Auditory-Verbal adherents posit that many young children who are deaf or hard of hearing, given state-of-the-art hearing technology, can and do attain language levels of their chronological-age peers with normal hearing. Language skills of children who are receiving auditory-based intervention should then be directly compared to those of their peers with normal hearing. The annual use of norm-referenced tests standardized on a normal-hearing population is therefore the minimal standard, given its consistency with the Auditory-Verbal tenet of normal expectations for children’s language development and facilitation of naturalistic language learning. This allows, at minimum, comparison of children with hearing loss against the known standard of typical language growth. It permits the monitoring of children’s language growth as a result of Auditory-Verbal intervention.

Criterion-referenced measures can be valuable for the development of Individualized Family Service Plans (IFSPs), Individualized Education Plans (IEPs), or both, and for describing the detailed language behavior of children. By nature, criterion-referenced measures are content-specific, so reference points are not necessarily dependent on a reference group. These can be individually homemade tests, composite language development scales (e.g., Rhoades, 1999), or psychometrically developed tools such as the Test for Examining Expressive Morphology (TEEM) (Shipley, Stone, & Sue, 1983). While some criterion-referenced measures are meaningful and valid for the individual provider of services because the current language status of young children can be frequently and repeatedly measured, they are obviously not the sole measures for objectively and adequately documenting program effectiveness (Garwood, 1982; McConnell, 2000). Yet, they can be excellent tools when used as a supplemental aspect of any Auditory-Verbal assessment protocol. Therefore, common sense and good practice dictate that all Auditory-Verbal clinicians develop a continuous progress-monitoring system incorporating both norm-referenced and criterion-referenced tests of language (Snyder-McLean, 1987). The next step is to determine at what points these measures will be administered.

**Toward a Standard Language Assessment Protocol**

Good intervention practice necessitates obtaining baseline and annual data with at least a norm-referenced global language instrument as well as getting information quarterly using specific and perhaps additional global language norm- and criterion-
referenced tests. Assessments must be different each quarter, because a test typically should not be administered more than once per annum. Therapy is not to be provided to any child unless pre-intervention data is used as the control against the child’s own language growth measured over time. Outcomes of quarterly testing can alert therapists to potential learning difficulties. This assessment plan includes pre/posttest design involving each child’s entering level and/or rate of development with at least one standardized norm-referenced assessment instrument (Snyder-McLean, 1987).

Standardized assessment instruments are selected with the understanding that test items must be presented precisely as specified within the respective test manuals. This likewise applies to scoring the children’s responses; that is, there is little latitude given and certainly no more than with a child with normal hearing. If test protocols are not adhered to, then test scores must necessarily be considered invalid.

Developmental age-equivalency level can effectively describe a child’s current level of functioning and lay audiences readily grasp this concept (Snyder-McLean, 1987). It clearly informs parents and professionals how their children understand or use language compared to children with normal hearing. (In other words, the equivalent-age scale normalizes performance against that of children with normal hearing (Blamey et al., 2001)). Moreover, when test instruments yield a Developmental Quotient or age-equivalency level, the information is presented in a positive manner as it indicates what the child does know or use rather than how far the child deviates from the norm.

While some language scientists question the benefit of informing parents as to how their child’s current language compares to that of children with normal hearing, in terms of age-equivalent scores (McCauley & Swisher, 1984), our 30 years of clinical experience belies this concern. In fact, studies repeatedly indicate that parents desire candidness from teachers/clinicians as well as realistic timelines for learning speech and language (Bamford, Davis, Hind, McCracken, & Reeve, 2000; Dromi & Ingber, 1999; Harrison & Roush, 2001). The Auditory-Verbal option mandates that therapists convey the child’s true language gap from the time such intervention is initiated. When presented appropriately, parents easily understand the critical long-term goal of Auditory-Verbal therapy as being one of “normalization,” thereby welcoming comparisons of their child’s lexical–semantic and morpho-syntactic language skills to those of children with normal hearing. Ysseldyke (2001) writes “expectations drive both assessment and intervention decision practices in special education” and then notes the importance of assessment efforts focusing on competency enhancement, that is, transitioning children to a higher level. Parents can readily comprehend how much closer their children are to attaining the 4-year language-age equivalency — the age when children become grammatical geniuses, that is, when they “crack the morphosyntactical code” of language (Crystal, Fletcher, & Garman, 1978; Pinker, 1994).

Developing a Global and Specific Language Assessment Plan

Many norm-referenced standardized language measures, because of their global nature, often do not provide specific enough information on the outcome of language intervention (Ramey, Campbell, & Wasik, 1982). However, some currently available language test materials have more elaborate statistical analyses and, overall, are clearly superior products compared to those available ten to twenty years ago. Moreover, testing procedures can now be demonstrated easily and distributed widely, and expert opinions on the latest research are literally at our fingertips (Fewell, 2000).

Yet, some limitations remain. For example, most standardized instruments do not readily lend themselves to frequent repeated measures. A standardized language test typically should be administered only once per year.Criterion-referenced tests, however, may be given more often and may supplement the yearly standardized instruments. No one test should be the only source of information in assessing children’s language (Fewell, 1991). In fact, there is strength in employing multiple measures to include both standardized, norm-referenced measures as well as informal, functional, and criterion-referenced measures. Providing all measures is efficient and yields essential information in the assessment process (Fewell, 2000).

Global Language

Global language assessments have been employed more frequently during the past few years, particularly since many researchers have sought to demonstrate the viability of cochlear
These difficulties are further compounded by the need to consider the language level in both receptive and expressive domains. This is particularly important when designing an intervention plan for children with hearing loss. The Sequenced Inventory of Communication Development-Revised (SICD-R; Hedrick, Prather, & Tobin, 1995) and the Early Language Milestone Scale-Second Edition (ELM Scale-2; Coplan, 1993) are two instruments that can be used to assess these language levels. The SICD-R provides age-equivalency scores for children aged 0-4 months to 48+ months, while the ELM Scale-2 is designed for children aged 0-36 months. These assessments are valuable tools for identifying children who may require additional support or intervention.

Lexical–Semantic Language

A lexicon seems to be at the core of grammatical generalizations at several levels of representation; that is, lexical learning is of great importance in linguistic development (Beckman & Edwards, 2000). In fact, it is this lexical–semantic aspect of language that is most widely measured in children with hearing loss (e.g., Blamey et al., 2001; Bollard, Chute, Popp, & Parisier, 1999; Boothroyd, Geers, & Moog, 1991; Connor, Hieber, Arts, & Zwolan, 2000; Dawson, Blamey, Dettman, Barker, & Clark, 1995; El-Hakim et al., 2001; Geers & Moog, 1994; Gilbertson & Kamhi, 1995; Kirk & Hill-Brown, 1985; Robbins, Svirsky, & Miyamoto, 1997). Among the best known, most widely used, and most highly rated norm-referenced assessment instruments for examining semantic growth are the Peabody Picture Vocabulary Test – Third Edition (PPVT-III) (Dunn, 1996) and the Expressive Vocabulary Test (EVT) (Williams, 1997). These assessments are valuable tools for identifying children who may require additional support or intervention.

It is advisable to employ at least two global language assessment instruments with different ceiling levels, so that the second test can be used when children attain age-equivalency levels closer to the ceiling of the first test. For example, if one selects the SICD-R and CASL as global tests of choice, then one can establish a baseline with children prior to initiation of auditory-based intervention with the SICD-R until age-equivalencies of approximately 48 months are attained. These same children can also be tested with the CASL when they attain approximately 3 years age-equivalency in language. Aside from the need for continuity, assessing children with multiple language tests increases the likelihood of developing a good analysis of each child’s language skills and weaknesses in both comprehension and production.
the latter having been co-normed with the former. Both have a baseline age of 2 1/2 years and enable the examiner to convert raw scores into age-equivalency levels. Results from both tests can assist the examiner-clinician to isolate word-retrieval problems from reduced capacity of lexical store (Carlson, 2001).

**Morphosyntactic Language**

While one must be careful not to assume that lexical–semantic status alone reflects linguistic competency, it’s interesting to note the newly emerging body of empirical evidence that highly correlates word meaning and retrieval with morphosyntactic knowledge in early language development (Conway, 1990; Dale, Dionne, Eley, & Plomin, 2000). Indeed, it is the growth rate of the two critical linguistic subsystems, morphology and syntax, that appears to be most remarkable during the first 3 years of life for the child with normal hearing (Akhtar & Tomasello, 1997; Akhtar, Jipson, & Callanan, 2001; Hirsh-Pasek & Golinkoff, 1996).

The typical 3-year-old child with normal hearing attains an approximate 100% language growth rate for each 12-month period, respects language universals, and is a master of most grammatical constructions (Boysson-Bardies, 1999; Crystal, 1995; Kuhl, 2000; McLean & Snyder-McLean, 1999; Pinker, 1994; White, 1979). Conversely, children with hearing loss clearly demonstrate significant delays in morphosyntactic development that typically persist until adulthood. However, studies assessing these particular linguistic subsystems in children who are deaf or hard of hearing have largely employed language samplings that are of a nonstandardized nature (Blamey et al., 2001; Duncan, 1999; Geers, Moog, & Schick, 1984; Szagun, 2000; Tur-Kaspa & Dromi, 1999; 2001; Yoshinaga-Itano, 1998). There is a paucity of data on the rate of morphosyntactic growth among children with hearing loss (Blamey et al., 2001; Tomblin et al., Spencer, Flock, Tyler, & Gantz, 1999). Perhaps it is because it is relatively more difficult to measure if their phonological development is delayed (Nelson & Camarata, 1996). Given this backdrop, it behooves us to carefully examine the child’s morphosyntactic and lexical–semantic growth in language if we are to demonstrate the viability of Auditory-Verbal intervention.

One example of a norm-referenced language instrument for examining children’s understanding of syntax and morphology is the Test for Auditory Comprehension of Language - Revised (TACL-R) (Carrow-Woolfolk, 1985). The TACL-R targets children from 3 to 9 years and 11 months of age. Administering this test is rather straightforward, as the child essentially responds by selecting one of three pictures that best represents the verbal stimuli. This tool assesses the literal meaning of various words and basic word relations, the grammatical morphemes, and the ability to derive meaning from spoken sentences.

Because there have not been norm-referenced tests developed solely to assess the morphological production of young children, some Auditory-Verbal clinicians (Rhoades & McCaffrey, under review in press) have used the criterion-referenced Test for Examining Expressive Morphology (TEEM) (Shipley, Stone & Sue, 1983), which is highly correlated with scales measuring typical language development. The TEEM requires a basal of a 3-year age-equivalency prior to administration of the test; it measures children’s use of allomorphic variations of six morphemes critical to the English language. TEEM outcomes can be used to develop therapeutic objectives and can serve as one of many determinants for cochlear implant candidacy.

**Toward a Parent-Professional Partnership**

The Auditory-Verbal approach is both family-focused and family-centered; therefore the assessment process should involve an intimate parent-professional partnership (Bamford, Davis, Hind, McCracken, & Reeve, 2000; Roush, 2000). For an assessment plan to be parent-friendly, at least three objectives should be met. First, parents should actively participate in the assessment process. Second, parents should comprehend the terminology used in describing their child’s current language status. Finally, parents should be provided with assessment outcomes in a positive manner (Dromi & Ingber, 1999; Roush, 2000).

Parent participation in the assessment process means that parental ownership of the intervention process is encouraged. This philosophy takes advantage of parents’ extensive knowledge about their children’s language skills and taps into the child’s cultural and family dynamics (Brown & Barrera, 1999). At the very least, this type of assessment mandates parents’ sharing some of their perceptions with clinicians. Parent-report measures are not subject to external factors such as fatigue or lack of familiarity with the examiner that may limit young children’s performance during administered assessments. Ultimately, parental
participation in the assessment process facilitates parental knowledge of the hierarchy of communication skills and they become outstanding observers of their children’s communication style (Moeller & Carney, 1993; Yoshinaga-Itano, 2000).

Parental assessment of their child’s language can be accomplished with the use of instruments ranging from standardized criterion-referenced tests to norm-referenced observational checklists of developmental skills. Parents can monitor the progress of their child’s language development with a variety of norm-referenced language scales (e.g., Rhoades, 1999) on a monthly, quarterly, biannual, or annual basis.

The Developmental Profile-II (Alpern & Boll, 1982) is a reliable and valid norm-referenced standardized parent report assessment designed for children from 0-9 years of age. While this tool does not examine children’s language in its receptive and expressive components, it does provide an overall global language age-equivalency level as well as a means of assessing four other developmental domains. Another reliable and valid norm-referenced standardized parent questionnaire, and possibly a more sensitive instrument, is that of the Minnesota Child Development Inventory-Revised (Ireton & Thwing, 1992), designed for children from 6 months to 6 1/2 years of age. It measures expressive and receptive language as well as six other developmental areas. It yields a Language Quotient that permits comparisons with children with normal hearing and determines the relationships of language growth and chronological maturation.

It is recommended that language assessment encompass the following each year: (1) parental participation in the assessment of the child’s language; (2) norm-referenced global measurement of the child’s receptive and expressive language; and (3) analysis of both lexical–semantic and morphosyntactic aspects of the child’s language comprehension and production. These instruments yield language-age equivalency levels that are readily understood by parents and professionals.

A Tracking Model

Historically, developmental change in language of children who are deaf or hard of hearing has come about rather slowly. Now teachers/clinicians report that Auditory-Verbal therapy, coupled with effective hearing prostheses, results in growth rates that approximate those of children with normal hearing. However, one cannot attribute that growth to those interventions, or any others, unless an assessment tracking model, as proposed here, is used consistently to provide outcome measures in group research designs, even if nonrandomized (Slater & Baum, 1998). It is absolutely critical that all treatment approaches for children who are deaf or hard of hearing are based on outcome data (Yoshinaga-Itano, 1999).

In summary, the position proffered here is for auditory-based service providers, in particular Auditory-Verbal therapists, to employ multiple measures of language. These tests should include, at minimum, one annual norm-referenced standardized global instrument that can provide a baseline for a continuum of language skills, even for the child who begins therapy with little or no language. Additionally, there needs to be interim lexical–semantic and morphosyntactic measures in both receptive and expressive domains as well as parent assessment of the child’s language development, scheduled on a quarterly basis. Most, if not all, language test instruments should have raw scores convertible into age-equivalent scores for ease in explaining results to parents. Consistently collected language data will enable parents and professionals to judge the efficacy of intervention services, including Auditory-Verbal communication options, for children with significant hearing loss (Vaughn, Klingner, & Hughes, 2000). Finally, this position paper advocates for the sustainability of Auditory-Verbal intervention research-based practices, because additional long-term research findings are needed to demonstrate that it is a highly effective intervention approach.

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