Auditory Perception

It is commonly thought that in the normal individual the auditory sense is the only one to function perfectly from the moment of birth, whereas other senses take some time to develop completely. However, unless an individual can make sense out of what is heard, hearing is, for all practical purposes, nonfunctional. Recently, we have come to realize that certain types of brain injury or dysfunction make it difficult, or impossible, for an individual to make sense naturally of the auditory stimuli received by the brain. It should be pointed out that *hearing* and *listening* are not synonymous in the auditory process. Whereas hearing is basically a physiological process, listening is an intellectual one, requiring interpretation, analysis, integration, and evaluation.

Some children have yet to learn that sounds have meaning. The ability to pinpoint the source of a sound and identify its unique characteristics requires that the child be able to focus attention long enough to learn these things. Outside noises and subtle classroom sounds, such as the hum of fluorescent lights and radiator noises, can distract the child who has a problem focusing attention. In addition, the ability to store auditory information and retrieve it in proper sequence is basic to the learning process. Without these skills it is virtually impossible to learn spoken or written language. Without language, one is extremely limited in the ability to communicate with others or to understand the world.

Children with auditory perception problems *may* have *some* of the following characteristics. It is seldom, however, that we would see all these behaviors in one individual.

The inability to

- Locate the source of a sound (localization)
- Identify specific characteristics of sound (intensity, duration, pitch, timbre)
- Relate a sound to its symbol
- Repeat what was said without visual clues
- Follow directions without visual clues
- Recognize when a sound changes
- Identify same and different sounds
- Distinguish a specific sound from among others (figure-ground)
- Recognize previously learned auditory material when presented in a different medium
- Integrate auditory information with other sensory data
- Comprehend words in a song

Training in listening and interpreting sound develops auditory perception. It is obvious that music learning depends on one's ability to perceive aurally. Conversely, music training can enhance auditory perception. When planned with specific aural skills in mind, music activities can help a child

- Improve the ability to attend to aural stimuli

- Interpret both verbal and nonverbal information
- Remember auditory learning from one experience to the next
- Integrate auditory information with that received through other sensory channels

Sound Discrimination

The characteristics of a sound (i.e., *intensity, duration, pitch,* and *timbre*) are presented as subdivisions in the activities for developing auditory discrimination skills. Music education goals and objectives generate sequential music experiences leading to a thorough understanding of these characteristics and the ways in which they are combined in music composition. Children with auditory perception problems frequently have difficulty in processing speech sounds. It is interesting to note that speech, singing, and music all have the following common elements; tempo, rhythm, pitch, stress (accent), and dynamics. Auditory discrimination skills, then, are equally important for general learning and for music learning.

Intensity Of all music elements, dynamics is most easily comprehended. In the average child it is the first to develop, and we usually find that young children can easily discriminate between loud and soft by the time they enter preschool or kindergarten. With these children our task is mainly to refine their skills to include discrimination of more subtle differences in dynamic levels. Children who lack gross loud-soft discrimination are likely to include the hearing impaired.

Duration Duration is the element in music that deals with time concepts. Time concepts are tempo (the speed of the music), meter (the organization of beats, usually into measure), and rhythm (the organization of longer and shorter sounds and silences within a time framework). Rhythm is basic to body function and speech as well as music. Recently, much attention has been focused on biorhythms, and educators, too, are beginning to be concerned with how an individual's natural inner rhythm relates to learning style and needs. Classroom activities (and/or tempo in music) are often paced too fast to enable all learners to grasp the objective.

Pitch Pitch concepts, such as high/low and up/down, are necessary for understanding the melodic structure of music. Seriation and sequencing skills, characteristically lacking in many learning-disabled children, are utilized in understanding scales, modes, and harmonic structure in music. In some countries of the orient and Africa, languages are tonally based; therefore, pitch discrimination is a prerequisite to speech. The same word spoken with different pitch inflections has multiple meanings. It is often said that there are no tone-deaf individuals in those countries. Whether or not this is true, one can certainly appreciate why a poor sense of pitch would serve as a barrier when learning the language. The importance of pitch inflection in the English language is probably underestimated until one experiences listening to speech without inflection or with misplaced inflections. It has been reported that, in retrospect, Anne Sullivan

regretted that she did not train Helen Keller's voice before teaching her to speak. Miss Keller's voice quality was reportedly quite poor and her speech was totally lacking in pitch variance, making it difficult to attend to for any length of time. It was a great source of disappointment to Miss Keller herself, who as a young adult took singing lessons in an effort to improve it. In addition to speech and language development, the ability to recognize, identify, and reproduce pitches of varying frequencies is necessary in perceiving and reacting to one's environment.

Timbre Timbre refers to the "color" characteristics of a sound that give it a unique quality. It is the awareness of timbre that allows a person to aurally distinguish a clarinet from an oboe or a car horn from a train whistle. Without timbre discrimination skills, the environment could be a hostile place in which to live. Again, timbre discrimination is an important skill in the development of speech and language. Comprehending vowel and consonant sounds depends largely on the ability to discriminate differing timbres. When children are screened for auditory discrimination problems, the measure used tests for discrimination of *speech* sounds *only*. It is not unusual, however, for children who have been identified as having auditory discrimination problems to perform as well as their peers in nonverbal discrimination tasks. Discrimination of musical sounds involves a more gross discrimination. Often the child's problem will be more obvious in the inability to learn and remember words to songs.

In all discrimination tasks, the lowest level of competency is that of recognition of same and different, followed by identification of specific characteristics and, finally, by integration and synthesis. Discrimination tasks should begin with two greatly contrasting sounds and gradually move to finer discrimination of sound among more dimensions. Subsequent goals should facilitate generalization and transfer.

The long-range goals for auditory discrimination skills are found in all music education curriculums and are equally valid for developing auditory skills for general learning. Each child demonstrates

- The ability to perceive and identify (label) each characteristic of sound
- An understanding of the characteristics of sound through musical performance
- The ability to creatively apply understanding of the characteristics of music

For the child who has difficulty processing sound, auditory learning is facilitated by pairing the auditory stimulus with another sensory mode such as *visual* (pictures, diagrams), *kinesthetic* (body movement), or *tactile* (manipulative materials). At some point, however, these extra auditory clues must be withdrawn lest the child become dependent on them. Since distance is a major factor in auding, it is recommended that the distance between the sound source and the child be increased *gradually* to as mush as thirty feet for those activities in which it would be appropriate.

Summary

Auditory perception skills are basic both to general learning skills and to the development of musicianship. Specific auditory skills include awareness, localization, memory, sequencing, and the ability to discriminate the sound characteristics of pitch, duration, intensity, and timbre. Deficiencies in auditory skills frequently cause language and speech difficulties. Music activities not only provide experiences in all auditory skills, but they also motivate increased auditory attention because of the basic appeal of music and the physical involvement of the learners.