
Texas School for the Blind & Visually Impaired Outreach Programs

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Texas Focus: Learning From Near to Far

I Hear With My Little Ear, Teaching Auditory Object Perception (AOP)

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Presented by

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I Hear With My Little Ear Teaching Auditory Object Perception (AOP) to Young Students

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Young students with visual impairments can and do use auditory feedback to glean useful information about their environment. Even preschoolers have the ability to auditorily locate classrooms, public restrooms and other rooms. They can locate intersections and can use distant sounds down each hallway for orientation purposes. When taught to walk down the hallways without trailing the wall, most young students will automatically travel in the exact middle of the hallway, even when the hallway is circular or zig-zags. These auditory skills are all examples of the most basic levels of Auditory Object Perception (AOP).

Auditory Object Perception is the process of locating distant objects using sound waves. When a student learns to listen for returning sound waves (that have been reflected off nearby objects) the student can identify the location of the object. This skill enables the student to navigate directly to or around the object. As the student learns to interpret the reflective sound waves, he/she is often able to describe characteristics of the object, such as height, width, and texture (what materials the object is composed of); the distance of the object can also be determined. AOP and echolocation are similar processes of listening to reflected sound waves; however, echolocation occurs when a person listens to sound waves that are reflected after producing a clicking sound with his/her tongue while AOP is listening to the environmental sounds that are reflected naturally without clicking.

Students of all ages can easily learn more advanced levels of AOP; AOP skills go hand-in-hand with foundation orientation skills and can be easily incorporated into all Orientation and Mobility (O&M) lessons. (For more information about foundation orientation skills, see article Brauner, D. (2009). Putting ORIENTATION back in O&M: Teaching Concepts to Young Students. AER Journal Research and Practice in Visual Impairment and Blindness, volume 2 (number 3), 138-143.) Most students already use obvious auditory landmarks for orientation purposes. Teaching AOP skills is simply the process of guiding students to become more aware of subtle auditory sound waves. Remember the classic game, “I spy with my little eye?” Children are asked to find an object with specific characteristics – often a specific color or shape. (Example: An adult might say, “I spy with my little eye something red.” The child would look around the room and guess objects that are red.) Students with visual impairments can play a similar game - “I hear with my little ear” - to locate an auditory object or landmark. (Example: When walking down the hallway, the child might “spy” the hum of the water fountain, the kids running in the gym, the phone ringing in the office.) As the student learns AOP skills, the O&M instructor will name specific characteristics - height, width, or texture - of an object. (Example: “I hear with my little ear something that is taller than I am.”)

O&M instructors typically encourage students to pay attention to, name and use – for orientation purposes – the obvious auditory landmarks. The student should already be walking independently down hallways (without shorelining/touching the walls) and should be identifying most intersections by sound. Ideally, foundation orientation concepts are introduced early, while the student is using an adaptive mobility device (AMD) rather than a long cane. (There are many reasons to initially use an AMD, including the fact that AMDs require less physical strength and less mental concentration than long canes, allowing the young student to focus on orientation concepts and AOP techniques. Foundation

orientation skills, when introduced as soon as the student becomes mobile, enable the student to successfully travel independently in a variety of environments rather than being a rote route traveler.) Basic AOP techniques should also be introduced early. In an unfamiliar area, preschoolers should be able to use AOP to state when the wall starts and stops. If the student has difficulties, initially take the student using Human Guide (versus independently traveling with his/her AMD or long cane) so that the student can completely focus on identifying the presence and absence of the wall. The student should not touch the wall; however, some very young students who are still learning basic concepts may need to tactually confirm the wall (after the wall has been identified). Repeat the activity with the student traveling farther away from the wall, with the student traveling independently with his/her AMD or cane, and with the student in outdoor environments. Outdoor environments allow the student to travel further away from the building/wall and outdoor settings introduce additional environmental AOP sounds. Be sure to name the wall texture (brick or wood) as the student will soon be able to distinguish various textures.

When traveling with his/her class, encourage the student to practice walking in a straight line down the hallway keeping his/her right shoulder approximately one foot from the right wall (versus walking in the middle of the hallway). In an open gym, ask the student to walk to the wall (stopping just in front of the wall), turn and follow the wall while staying one foot from the wall. The student should listen for the corners and make the turns without touching the wall. When starting from an open area in the gym, the student should listen for a corner, point to it, and then walk in a straight line to the corner. If the student has trouble hearing the distant corner, the same activity can be done in a smaller open room. In a large environment such as the gym, some students initially benefit from “backward chaining”. Start at a point close to one corner; listen, point and walk directly to that corner. Move farther from the corner and locate the corner again. As the student develops good AOP skills in a large open space, he/she can be encouraged to move

quickly and freely (with or without a cane) in the middle of the open space.

Use the phrase “what’s different?” to encourage the student to anticipate subtle auditory sounds. Prompt the student before walking, not while the student is close to the wall or object. When walking outside, the student will first verbalize when the wall starts/ends; however, most students will quickly determine other characteristics (such as a recessed door) or additional objects (such as a tree). Most students can rapidly identify a variety of auditory differences; however, they are initially unable to name an object which is identified only by using sound waves that are new to them. Once the student is given the name (recessed door or tree), he/she is typically able to generalize the information and can name similar objects (recessed doorway or tree) in other environments. When locating a new object, encourage the student to “associate” the new sound to a sound/object that he/she is familiar with. Accomplished AOP students can locate walls/buildings from great distances (100+ feet). Using the open ended phrase “what’s different?” is an excellent way for the O&M instructor to understand what information the student picks up on and how the student is using his/her AOP skills, even when the student cannot adequately express himself/herself. Analyzing the student’s AOP skills is especially crucial as most O&M instructors are not able to imitate or even hear the sound waves themselves!

Students should be introduced to AOP skills in a variety of environments. To ensure success, a student should initially be encouraged to locate large objects. In a bus parking lot, ask the student to verbalize when he/she detects a change – “what’s different?” Using Human Guide, walk the student along the length of a bus allowing the student to determine the presence or absence of the bus. Without touching the bus, ask the student if the object is waist height, head height, or way over his/her head. If possible, have the student identify

the difference between the hood (approximately head height) and main part of the bus (way over his/her head). If he/she is a short student (kindergartener) he/she may not be able to detect the hood of the bus, as the hood will be way over his/her head! Use prompts that encourage independent thinking. Once the student has identified the bus, walk around the bus again, stopping by the tires. Tell the student that something is different and see if the student can tell the difference between the metal bus and the rubber tire. (It is fine to incorporate other senses, such as the smell of the rubber tire.) Be sure to point out safety issues (such as overhanging mirrors) if the student is tall enough to bump them.

Ask the student to locate and point to other buses parked nearby. Ask the student to walk up to the next bus and stop just before touching the bus. There are many fun ways to practice AOP skills with buses: spin the student in a circle (to disorient him/her) and then ask him to locate the bus or to locate a specific area of the bus (hood, glass door, tire) using only AOP skills. Have the student pretend to be the O&M instructor and you are the student. This is a wonderful way to model what you want the student to do or to demonstrate/reinforce the concepts you are teaching. Have the student walk in a line in front of the buses, counting each bus as he/she walks past. Using Human Guide, ask the student to verbalize “what’s different?” as you walk beside a parked car, locating the beginning and end of the car. Then describe the distinguishing characteristics of the car (especially the height) in order to determine if it is a car, truck, van, or SUV. Whenever possible, phrase prompting questions so that the student has to “figure it out” rather than using leading questions. (Example: “What’s different?” encourages the student to think about all the car’s characteristics versus “How tall is it?” which is a leading question.)

Locating doors using AOP is a critical skill for independence! Many school doors are recessed and/or have covered walkways. Initially, you

may need to point out the sounds that the student should listen for, such as people walking in/out, the door opening/closing, the echo of the recessed door, the echo from the covered walkway, etc. Have the student point to the doorway. If the student is on the sidewalk, have the student walk to the door. Initially the student may need to start close to the door; however, if given opportunities the student will learn to use AOP techniques to locate the door from increasingly greater distances. Remember, the student has already practiced locating walls and buildings from greater distances (potentially 20-30 feet). Now, build on this skill. From different locations along the sidewalk, have the student determine where the building is and walk towards it. If the sidewalk is parallel to the building, have the student walk along the sidewalk (without shorelining – similar to walking down the hallway without shorelining) and using AOP, have the student verbalize when something is different. Quite often, the student will verbalize a variety of “differences”, including objects between the sidewalk and the building (fence, tree, etc.). When these “teachable moments” happen, take advantage of them! Show excitement, give the student praises, ask the student to describe the difference and name the object if the student is able to; and, if necessary, have the student touch the object in order to fully understand what it is. Continue along the sidewalk until the student locates the doorway. Ideally, the student will identify a difference at the door. He/she may distinguish an additional characteristic (recessed door or covered walkway) or a change in texture (brick wall and glass door). Be sure to name what characteristics make the door different so that the student will anticipate and recognize that characteristic next time. As necessary, have the student repeat locating the door from different starting points (and opposite directions if possible), using Human Guide, independent student travel, modeling, etc.

If the doorway has a covered walkway, the student should determine “what’s different?” Initially, the student may need more prompts to pay attention to differences that are above his head. Have the student identify the end/beginning of the cover. As always, discuss why there is a cover over the sidewalk, point out any safety issues such as poles

that support the cover, and ask the student to guess where the cover begins and why. Have the student locate the end of the cover and then ask the student to jump so that he/she is “under” the cover and then jump again so that he/she “out” (not under the cover). Ask the student to determine the texture (material that composes the cover). Most schools have metal covered walkways.

Create opportunities for the student to locate narrow objects such as trees, then telephone poles, sign posts, chain link fences, etc. Initially using Human Guide, prompt the student to tell you when something is different. If the student misses the narrow object, go back and model by verbalizing that something is different and asking the student to point to what is different. Encourage the student to describe the height, width and texture characteristics and include that the tree is much wider at the top than at the bottom and that the top is not as dense. Eventually encourage the student to guess that the object is a tree. Ask the student to walk directly to the tree and to reach out and confidently touch the tree (learning to determine the distance to the tree). Have the student walk around the tree –without touching – while trying to stay an equal distance from the tree as he/she walks around it. Using AOP, locate other trees and have the student compare this tree to other trees (which tree is taller, wider, etc.) Find a tree that is in front of a building and ask the student to locate both objects. Have the student distinguish which object is closer.

Once the student can follow along walls and other large objects, ask the student to locate objects that are not over their heads, such as bookshelves. In the school library, ask the student to walk up to a book shelf, stopping just before he/she touches the shelf. Have the student turn and follow the bookshelf. At the end of the bookshelf, have the student (again using AOP) find the next bookshelf and repeat the activity. If possible, have the student follow completely around a free standing bookshelf, stopping at the place he/she started. If the

bookshelves are arranged in rows, introduce the concept of “aisles” (open space between the rows of bookshelves), “ends” (short ends of the bookshelves) and “long shelves” (long length of bookshelves). Without touching, students should be able to travel straight down the aisles, walk along the “ends” counting the aisles etc. When traveling in businesses such as a grocery store, the student will be able to use his/her AOP skills to locate and walk in a straight line along aisles, ends and long shelves in the stores. Eventually, the student will be able to locate objects that are waist high or lower, such as tables in the classroom, school cafeteria and in restaurants.

When entering an unfamiliar classroom, the student should stop and identify where the open space is and where the walls are. If the entrance door is in the left corner of the room, there will be a wall on the left and the open space will be straight ahead and on the right. AOP skills can be used in conjunction with self-familiarization skills (naming walls 1, 2, 3, and 4; and naming main objects, areas or departments along each of the four walls). When traveling in the community, the student should use AOP immediately upon entering a gas station, fast food restaurant, or other business in order to quickly determine the general layout of that business.

Why is AOP important? The following is a real-life example of how a totally blind fourth grade student, who has been using AOP for the past two years, incorporated AOP into an O&M lesson:

Walking with his long cane, Johnny confidently strode down a new sidewalk in a totally unfamiliar part of town. Without leaving the sidewalk, Johnny excitedly explored the rich environment around him, effortlessly describing distant objects as he passed them. Johnny talked about the huge shade tree (10’ away) that must be an oak tree (as he crunched acorns under foot). He described the one story brick building (20’ away) that had bushes in front and several glass windows. He went on to detail when the building recessed in and the bushes

turned into a small tree (and possibly flowers? Johnny mused). Continually walking at a brisk pace in a straight line down the middle of the sidewalk Johnny casually mentioned when the brick wall jutted back in line and the bushes resumed. He accurately described the glass doors (glass went to the ground where the windows did not and the windows has bushes in front of them). He described walking beside a truck parked parallel to the sidewalk between him and the building and when the building suddenly became taller. He casually mentioned that he passed two sign posts and a mailbox between him and the street. He discussed an open garage door (that had an unusually big echo!) and came to a sliding halt in front of a big vehicle – one that was bigger than a bus! (firetruck)

Walking half a block back behind, Johnny's O&M quietly observed without making any comments. Johnny maintained great posture with his head up which enabled him to hear the sound waves clearly. Johnny walked quickly and confidently in the middle of the narrow sidewalk; his cane tip rarely touched the grassy edge. AOP is one of many orientation tools that Johnny effortlessly incorporates into his travels - AOP is an important part of his life! Along with helping Johnny travel safely with fluent movements, AOP, without any tongue clicking, provides Johnny with rich, dynamic images of his surrounding environment!

The sequence of teaching AOP can be varied according to the student's current abilities and concept levels, the specific/available environment, what motivates the student, etc.; however, it is easier for young students to locate large, solid objects that are in close proximity before learning to locate smaller objects, objects below head height, or objects that are farther away. Determining differences in sound waves is initially easier than naming the object or describing the change (auditory difference in the sound wave). Determining characteristics such as height, weight, and texture as well as determining which object is

closer/farther, are all more advanced levels of AOP. Academic and multi-handicapped students can all learn and benefit from the use of AOP techniques. Great cane skills, vital orientation skills and essential AOP skills should be introduced simultaneously at an early age through basic skills building to more complex and advanced levels. Young students with visual impairments can easily learn to interpret sound waves and can glean detailed images about his/her surrounding environment and they can use this information to travel safely, freely and confidently in familiar and unfamiliar environments.

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Figure 1 TSBVI Outreach Programs logo



Figure 2 OSEP logo

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