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The Sound Path:

Adding Music to a Child Care Playground

David is a three-year-old boy with congenital blindness. He attends a full-day child care program and receives special education and related services through a contract with the local school system. His class spends large blocks of time on the playground daily. The playground, however, appeared to be a scary place for David. Unlike his classmates without disabilities, David did not have fun on the playground, and he appeared lost in this large space. He held a teacher's hand or was held by a teacher much of the time and did not play on the available equipment unless directed by a teacher. Sometimes he pushed a toy shopping cart on a concrete track for riding tricycles. Yet when David bumped into the fence, he did not back up and change directions; rather, he stopped and cried. He engaged in frequent head shaking and body rocking. There were few contacts with peers, unless they initiated to him, but those initiations were infrequent.

David's behavior is not surprising, because children who are blind need help managing large, undefined spaces, such as playgrounds (Warren, 1994). David's experience also was not unique; other children with special needs were unengaged on the playground. They wandered, sat, got involved on occasion, but stayed involved for only short periods. This occurred despite the well equipped nature of the playground, which had sandboxes, climbing equipment, flower gar-

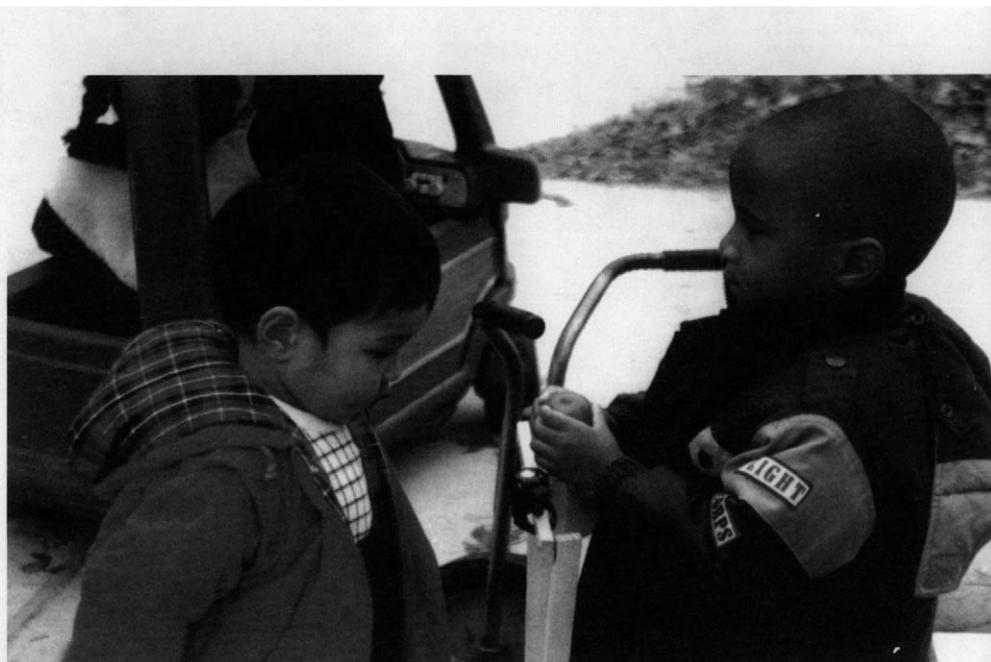
dens, a playhouse, a concrete track, trees, and many toys such as tricycles, wagons, large building blocks, sand toys, balls, hoops, and other toys. The lack of productive playground experiences for young children with disabilities is common, in our experience.

Broad goals for David and other children with disabilities can be addressed on playgrounds (Reichow & Wolery, 1999). These goals include increasing engagement, the variety and duration of play, the frequency of social and

communicative interactions with peers, and physical strength and agility. Several procedures exist for such goals (Sandall, McLean, & Smith, 2000), and one strategy is to modify the physical environment (Sainato & Carta, 1992). For children who are blind, the modifications involve making the structure predictable and adding appropriate materials. Hearing and touch are the primary means by which those who are blind connect with and understand the social and physical environment. Thus, sound-making materials and those involving music may be useful additions to playgrounds. "Almost all children respond to music. ... If you can use it carefully and appropriately, you can reach into that child's potential for development" (Robbins, 1999). Because music is a powerful and nonthreatening medium, many outcomes may be possible.

Why Use Music With Young Children?

The American Music Therapy Association (AMTA) (www.musictherapy.com) suggests music should be used to promote learning for the following reasons: (1) music reaches children at different levels, thus it can promote a range of skills such as social and communicative interactions, motor skills, and self-expression; (2) music may make play more joyful and thereby naturally increase play; and (3) music can be included in many activities and its enjoyable qualities may motivate



children to participate in those activities (AMTA, 2002).

Music crosses cultural and linguistic lines, allowing children from different backgrounds to participate in fun activities together. Music is an appropriate leisure activity. Music occurs naturally in many settings, including most early childhood classrooms. Many children with and without disabilities enjoy music. Braithwaite and Sigafoos (1998) found including music in activities increased the communicative behaviors of some young children with developmental disabilities. Models for using music to serve children with disabilities have been described (Chester, Holmberg, Lawrence, & Thurmond, 1999; Davis, 1990). Finally, musical modifications of physical spaces (e.g., playgrounds) may help meet the needs of children like David.

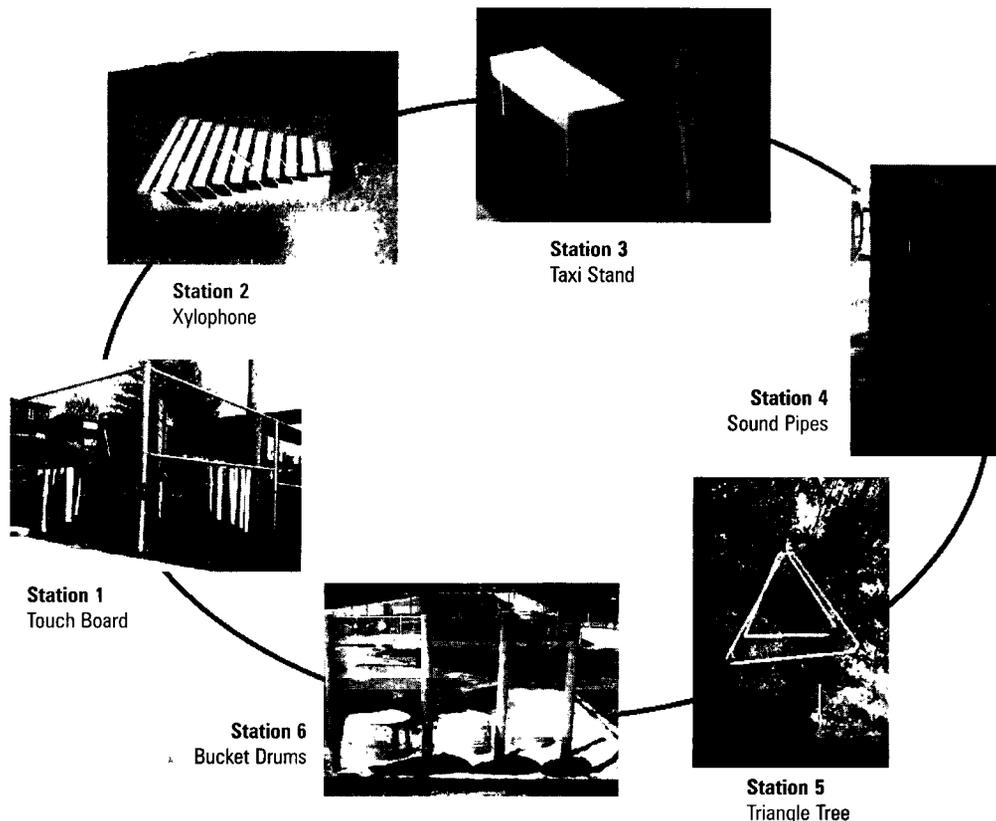
Music crosses cultural and linguistic lines, allowing children from different backgrounds to participate in fun activities together.

Musical Additions to the Playground

The "Sound Path" was a project to modify David's child care playground to assist him in being more independent and a part of the outdoor activities of the child care program. A music therapist (the first author) devised the modifications using ideas and principles from her discipline. The project had four elements: (1) a boundary to define the space and help David move independently on the playground; (2) musical stations to encourage interaction and play; (3) recommendations for each station to promote sensorimotor, social and communication, cognitive, and emotional skills; and (4) songs for each station.

Figure 1

The six music stations that were developed for the Sound Path: Touch Board, Xylophone, Taxi Stand, Sound Pipes, Triangle Tree, and Bucket Drums.



Sound Path Boundary

The Sound Path was an addition to the playground to make it more accessible to David. The Path was made of 109 m of drainage pipe looping the central portion of the playground to establish a stable boundary. This boundary was modeled on a guiro, a Latin American percussion instrument with ridges that makes sound when rubbed with a stick. About two-thirds of the drainage pipe was submerged in the ground. As with a guiro, the pipe had ridges and produced sounds when rubbed with a stick. The submerged pipe created a path from one musical station to another

(described following); it had breaks in it near each station.

To assist David in moving on the path, a wooden "cart" was made. The cart had a handle bar, four rubber wheels, and a stiff rubber flap attached to the bottom. The flap scraped against the ridges of the drainage pipe, making a sound. Thus, when he pushed the cart on the drainage pipe, he received auditory feedback; when he pushed it off the pipe or when he came to a break in the pipe by a music station, the sound stopped. David and other children pushed the cart on the pipe and walked behind it without difficulty. They walked on the pipe and the ground around it.

... [I]deas included making an interactive environment with multisensory equipment that enhanced therapy and provided a relaxed atmosphere to encourage children to explore and act on the environment.

Table 1

Music Stations

Six music stations with hand-made instruments were added to the playground. The music therapist made these instruments from materials donated by local hardware and music stores. Parents and staff of the program installed the Sound Path and stations on a special workday. The stations were strategically located near sandboxes, a tricycle track, and a gathering bench to increase the chances of social contact. Pictures of the stations and their relative positions are shown in Figure 1. The stations were accessible to all the children, easy to play, and complied with the safety regulations of the state's child care licensing agency.

Some ideas proposed by Snoezelen as cited in Hulsegge & Verheul (1998) for indoor multisensory stimulation rooms were included in the station designs. These ideas included making an interactive environment with multisensory equipment that enhanced therapy and provided a relaxed atmosphere to encourage children to explore and act on the environment. The stations were designed to be multisensory by using different materials (e.g., wood, metal), shapes, colors, and sounds to promote children's exploration. For each station, suggestions were written (see the example in Table 1) and given to the teachers during a training session.

Suggestions for Using the Sound Pipes

Recommendations to develop sensorimotor skills

- Explore the material. Is it cold or warm, hard or soft? Can you also feel the vibration of the pipes?
- Listen to the different resonance of the Sound Pipes if you first hit one while holding it in your hands, and then open your hand and play it again. What's the difference?
- Explore how the instrument can be played: hit, scraped, touched, and so on.
- Coordination: hit high or low, left or right hand, one hand versus two hands.
- Listen to a long hold tone. Hit the pipe again when you can't hear it anymore. Compare it to the short tone of the Bucket Drum.
- Find the highest or lowest tone. Are there pipes that sound similar?

Recommendations to develop social and communication skills

- Call and response game (e.g., hit the pipes three times and wait for a musical response from the other players).
- Practice turn taking.
- Interact with a signal given by a player (e.g., "If we hear the sound of a Sound Pipe, we walk; if not, we freeze.").
- Move and dance to the tempo and sound of a player (e.g., walk with long steps—slow tempo accompaniment; walk with short steps—fast tempo accompaniment; walk on tip toes—high sound accompaniment; walk on your heels—low sound accompaniment).

Recommendations to develop cognitive skills

- Imitate what somebody else played before.
- Go all the way around the trunk of the tree with your stick and see what sound you make. Can you describe it?
- Speak your name rhythmically and give every syllable a tone.
- Recite stories and sing songs that include bells (e.g., "Are You Sleeping?" [French Traditional]). Hit the pipes when the verse is, "ding, ding, dong."

Recommendations to develop emotional skills

- Find a musical expression for different emotions. Can you play happy, angry, or sad tunes?
- Use precomposed songs; for example, "Friends," which was written for the Sound Pipes and expresses feelings. Sing the song and accompany it with the Sound Pipes.
- Self-esteem: Be the signal giver or conductor.



Station 1

The first station, Touch Board, is near the playground entrance and the start of the Sound Path (partially submerged “guiro” pipe). The Touch Board consists of a bamboo xylophone, jingle bells, rain-

maker, a second set of jingle bells, and another bamboo xylophone. These are attached in a line to the chain link fence. Children activate the bamboo xylophones by hitting them with wooden dowels, the jingle bells by shaking them, and the rainmaker by turning it. A plastic box is attached to the fence near the first xylophone to store the dowels. When David entered the playground this station oriented him in space. He would touch the bamboo sticks and bells, turn the rainmaker, and say, “Turn the rainmaker. Go find the pipe.”

Station 2

This station is a Xylophone about 1 m in length located at the first break in the Sound Path near a sandbox with climbing equipment. The Xylophone is made of hardwood and has 11 bars. Each bar is painted either blue or green, and bars of the same color sound harmonically together. Although David could not see the colors, his peers could. We wanted to promote his interactions with peers; thus, the stations were made to be attractive to the sighted children. Children play this station by hit-

ting the bars with dowels. A plastic box is attached to the Xylophone to hold dowels. David’s teacher engaged him in hitting the bars and sometimes engaged him in singing. Peers occasionally joined them.

Station 3

This station, Taxi Stand, is at the second break in the Sound Path. It has a child-sized wooden bench and a trellis (1 m high) within arm’s reach of the bench. It is secured in the ground and painted yellow to simulate a taxi stand. A bicycle bell and a horn are attached to the trellis. It is near the tricycle track to attract peers riding tricycles and pulling wagons. Children squeeze the bulb on the end of the horn and push a button to activate the bell. The song in Figure 2 was composed for this station and is an example of the songs written for each station. The music therapist introduced the songs to each class during their circle time activities. This seemed to be David’s favorite station. He squeezed the horn often, rang the bell, and listened for passing vehicles. When he heard a wagon, he followed it, got in, and waited for a ride.

Station 4

This station, Sound Pipes, is at the third break in the Sound Path. It consists of seven copper pipes of different lengths attached to a tree trunk. Each pipe produces a different sound. Strong string suspends the pipes between two metal braces, which are screwed into the tree. The station is on this

tree because it has a bench around it where teachers and children gather to converse and rest. Children strike the pipes with dowels or pull them and let them strike the tree. A plastic box is attached to the bottom brace to store dowels. Children use this station often. David would follow the sound across the playground, often without the cart. He would climb onto the bench and pull on the metal pipes until someone handed him a dowel.

Station 5

This station, Triangle Tree, is located at the fourth break in the Sound Path. It consists of two large metal triangles hanging from a tree branch about 2.5 m above the ground. These triangles are of different sizes, producing different sounds. The wind activates them, and a metal mallet is attached to the triangles so an adult or child held by an adult also can ring them. David did not use this station frequently, but adults could ring the triangles to get his attention.

Station 6

This station, Bucket Drums, also is located at the fourth break in the Sound Path. Three galvanized pails of different sizes (thus producing different sounds) are attached between wooden posts in one of the sandboxes. The pails are turned over so their bottoms are about 0.5 m from the ground and form the drum surface. Rope is used to connect the pails to the posts. Children pound on the drums with their hands, dowels,

Figure 2

Song "Hello Taxi" composed for the Taxi Stand (music original).

Hello Taxi

Boogie Woogie*
Swing 8s

Petra Kern

Hel - lo ta - xi I need a ride to the o - ther si - de I
 need a ride, a ride all right, to the o - ther si - de
 side I wave my hand at the ta - xi stand, I ring the bell ding
 dong. The horn sounds loud and I will shout: Stop by
 me, ta - xi.
 to the o - ther si - de

*Characteristic LH accompaniment against each chord

Swing

etc.

or sand scoops. The finger game in Table 2 was written for this station, given to the teachers, and recited during circle time activities. David frequently pounded on the pails, held a good beat, and shook his body to the rhythm. Sometimes he vocalized to the rhythm, particularly when peers joined him.

Success of the Sound Path

As noted, the Sound Path was developed for David. His playground behavior was measured in a study with three phases: (1) baseline, (2) installation of the Sound Path and stations, and (3) staff training. Three findings emerged (Kern & Wolery, 2001). First, the installation of the Sound Path and music stations (before staff training) increased his engagement and the quality of his movement, and decreased his stereotypic behavior, but did not change how often he interacted with peers. His engagement was less than ten percent of observed intervals during baseline, and it increased to between 25% and 30% after the Sound Path and stations were added. His movement on the playground was more goal-directed after adding the Path and stations. His rocking and head shaking occurred in 11 of 12 baseline days (sometimes at a frequency as high as 60% of observed intervals). After adding the Path and stations, these behaviors occurred in three of seven days and the highest frequency was 35% of observed intervals.

Second, staff training increased David's interactions with peers. No interactions with peers occurred in eight of 12 baseline days and in only four of seven days after adding the Path and stations. When they did occur, the highest level was 15%. After staff training, peer interactions occurred in 14 of 17 days. Some of those interactions involved peers bringing him the cart and asking for turns with the cart.

Third, staff training produced additional increases in engagement and decreases in rocking and head shaking. The highest levels of engagement occurred after staff training. David often did not engage in any rocking or head shaking. The staff development consisted of one session during which the music therapist gave suggestions on how to use the stations and how to involve David and his peers in the stations. She gave the teachers copies of the recommendations and a compact disk with songs for each station, sang the songs with them at circle time, and urged them to encourage David to use the stations. The music therapist was available to consult with the teachers after the training session.

Adding the Sound Path and music stations in combination with the staff training activities seemed to have some unmeasured effects on David as well. He appeared more alert, more responsive to adults, verbally expressed likes and dislikes more frequently, and appeared to be in a better "mood." He seemed to understand turn taking more clearly, which

Table 2

Finger Game for the Bucket Drum*

Thumbs on the Drums By Petra Kern

10 little fingers jump on the drums.

8 little fingers ask the thumbs.

Can you jump up really high?

Yes, said the thumbs and start to fly.

10 little fingers jump on the drums.

8 little fingers ask the thumbs.

Can you play very fast and slow?

Yes, said the thumbs and played a tremolo.

10 little fingers jump on the drums.

8 little fingers ask the thumbs.

Can you play very soft and loud?

Yes, said the thumbs very, very proud.

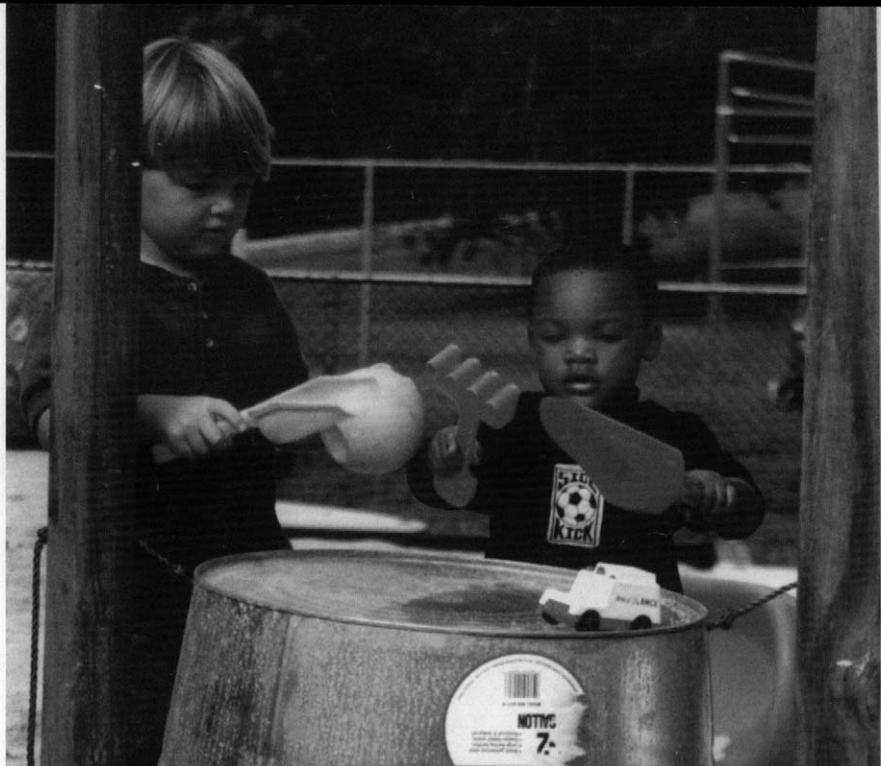
10 little fingers jump on the drums.

8 little fingers ask the thumbs.

Will you find a friend who wants to drum?

Yes, said the thumbs and start to run.

*These verses are spoken rhythmically but not sung.



has been noted as important for greater socialization (Gourgey, 1998). He also seemed more willing to take risks and was less fearful. For example, he continued to make the cart move even when he ran into objects.

The benefits of modifications extended to other children with and without special needs. For example, one child with cerebral palsy had a goal of grasping and releasing. Her teacher used the horn on the Taxi Stand station to work on this goal. A young child with autism, who had a goal related to cause and effect, was encouraged to hit the Sound Pipes

The benefits of modifications extended to other children with and without special needs.

with a dowel. Because children were attracted to the stations and tended to gather around them, more social interactions seemed to occur. For example, a child would begin to bang on the Bucket Drums, and the sound would attract other children who joined in the play. The stations also provided teachers with additional materials for engaging children. For example, when a teacher saw a child or group of children who were not engaged, she could begin to play one of the instruments and call to them. This often enticed the children to join the teacher and become engaged. Teachers used the stations in this way after the novelty wore off for the children. The stations also increased the sheer amount of equipment available to the children for play. In the child care program, the children attend 12 months per year. They often become bored with the existing equipment and the stations provided variety and alternative things for the children to do. The stations served to stimulate creativity. Children devised games with the stations; for example, as a

group they ran to a station, made it sound, ran to another, made it sound, and returned to the first, and so forth. Children also used the stations for dramatic play; for example, they used the Xylophone as a boat and pretended to be on the ocean.

The music stations and Sound Path were quite durable, and have been in place through two winters. The Touch Board required some maintenance due to rain damage, and the horn on the Taxi Stand had to be replaced a couple times because of excessive child use. As with other playground equipment, regular checks for safety and needed repairs is recommended.

Summary

The Sound Path, as described in this article, was a modification of a child care playground for a young child who is blind. It was designed systematically to define space and provide multiple stations with which he could play. These changes produced a better playground experience for him as evidenced by increased engagement and less rocking and head shaking. However, staff training was necessary to ensure that the stations promoted peer interactions. The staff were taught to use the songs and activities at the different stations and were explicitly told to encourage peer interactions when David was at a station and peers were near. The modifications seemed to produce unintended positive benefits for other children as well.

Notes

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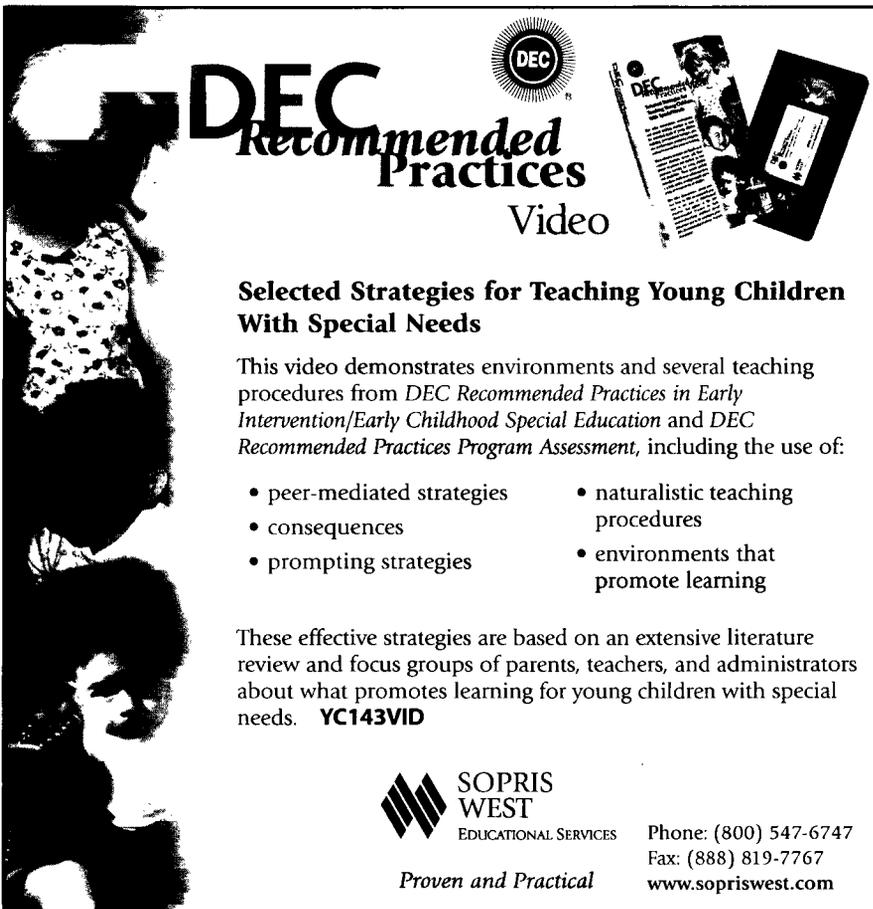
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