Instructional Effectiveness of an Integrated Theater Arts Program for Children Using Augmentative and Alternative Communication and Their Nondisabled Peers: Preliminary Study

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The use of inclusive theater arts activities offers numerous potential benefits to children using augmentative and alternative communication (AAC). The activities may provide an effective context to promote communication, social interaction, and artistic expression. This article presents a preliminary study that provides a descriptive analysis of the instructional effectiveness of a 2-week program that involved two children who used AAC and three nondisabled peers. Data were collected on the amount of time the children were engaged, the number of communication opportunities with which they were provided, the number of opportunities fulfilled by the children, and the success of the communicative turns. The results indicated high levels of engagement, frequent communication opportunities, and high levels of success across all children. The educational implications and future research directions are discussed.

KEY WORDS: augmentative and alternative communication (AAC), inclusion, theater arts

There are approximately 2 million Americans with severe communication disabilities such that their natural speech is inadequate for meeting their communication needs (American Speech-Language-Hearing Association, 1991). Children with severe communication disabilities (e.g., cerebral palsy, mental retardation, autism) require augmentative and alternative communication (AAC) (e.g., gestures, signs, communication boards, voice output communication aids [VOCAs]). Children who use AAC face significant challenges in learning language (Light, 1989) and building meaningful social relationships with nondisabled peers (Blackstone, 1989). Over the past 20 years, there has been increasing support for and implementation of inclusion of students with disabilities in regular education classrooms (Calculator, 1996). Unfortunately, individuals who use AAC are often included physically, but they may not actually have opportunities to participate fully within inclusive settings (Calculator, 1996). Concerted efforts are required to determine effective ways to enhance communication skills and promote socialization for children who use AAC in inclusive settings (Calculator, 1996; Logan, Bakerman, & Keefe, 1997).

The use of drama in an integrated setting provides numerous potential benefits for both children with severe communication disabilities and their nondisabled peers. In theater activities, children have the opportunity to build collaborative learning skills, develop appreciation of the motivations and perspectives of others, and explore new situations in a non-threatening context (Blackstone & McCarthy, 1997). Furthermore, theater activities can be adapted to enhance children’s learning of specific language structures and vocabulary (Stuart, 1988). Children who use AAC may have significant delays in language skills when compared with their nondisabled peers (Beukelman & Mirenda, 1992).

Research with children with disabilities not requiring AAC suggests that theater-based interventions may be used to support language and communication goals. For example, Curran and Kottenstette (1998) documented improvement in writing among children in an inclusive classroom who were part of a theatrical intervention. Children with learning disabilities and their nondisabled peers showed significant gains in story length and detail compared to control group subjects as a result of their involvement in the theater program (Curran & Kottenstette, 1998). Similarly, Raiser and Hinson (1995) documented how the use of a theater program enhanced the reading and memory skills of students with disabilities. Authors in the field of second-language acquisition have also discussed the usefulness of theater activities to assist in language learning (Jones, 1982; Livingstone, 1983; Savignon, 1997). Theater arts allow all children to be involved in
different roles at the same time and thus offer the potential to benefit children with various skill levels (Livingstone, 1983). This flexibility is important because children who use AAC may be addressing different goals than their peers. Unfortunately, information about the use of theater arts programs with children who use AAC is anecdotal (Higgins & Carney, 1995; Stuart, 1988); to date, the benefits have not been documented systematically.

If the potential benefits of theater arts activities are to be fully realized, the activities must incorporate principles of instructional effectiveness (Eggen & Kauchak, 1994). Some of the most critical factors for effective instruction involve the use of activities that engage students, give them opportunities to participate (active engagement), and allow them to be successful during the times that they do participate (Berliner, 1985). In the literature, engagement, opportunity, and success are typically analyzed in terms of time. Units of time studied include allocated time (i.e., time set aside for student learning), engaged time (i.e., time that students are actively responding or are attending to presentations, sometimes divided into active and passive engagement), and academic learning time (i.e., time during which students are engaged and actively responding with high levels of success during teacher-allocated time) (Berliner, 1985; Eggen & Kauchak, 1994; Tindal & Parker, 1987).

Although allocated time has been studied (Hollowood, Salisbury, Rainforth, & Palombaro, 1994; Ysseldyke, Thurlow, Christenson, & Weiss, 1987), it has been found to be only loosely correlated with student achievement (Eggen & Kauchak, 1994). The variables found to be the most strongly correlated with achievement are engaged time, opportunities for communication, and success during these opportunities (Eggen & Kauchak, 1994).

For children to be able to learn, they must attend to current material. Sindelar, Smith, Harriman, Hale, and Wilson (1986) suggested that time engaged is the best predictor of gains for students with disabilities. Logan and Keefe (1997) found that the time when students with severe disabilities are actually working with curricular material is relatively low: 38% in general education classrooms and 36% in self-contained classrooms. High achievers in regular education classrooms were shown to be engaged with material 85% of the time (Evertson, 1980, as cited in Eggen & Kauchak, 1994). Logan et al. (1997) found higher levels of engagement by students in small-group (two to four members) activities. Thus, theater activities offer the potential for high levels of engagement because they are often carried out in small groups (Bailey, 1992). Furthermore, theater activities can be highly engaging for students. According to Livingstone (1983), even the listener “must show understanding or otherwise of the speaker and relate what is being said to his own opinions and needs in order to be able, when he has judged that his turn to speak has come, to formulate an appropriate, acceptable and under-

standable message” (Livingstone, 1983, p. 25). The nature of theater creates less of a need for didactic teacher-student recitation and allows for more interactive learning.

Opportunities for communication are critical to effective teaching, for both students using AAC (Jorgensen & Calculator, 1996) and for regular education students (Berliner, 1985). Such opportunities may need to be explicitly structured for children using AAC because they are often placed in passive roles in conversations (Light, Collier, & Parnes, 1985) and are often preempted from opportunities to communicate (Calculator, 1988). Furthermore, their communication signals are often missed by teachers and unfamiliar partners (Calculator & Jorgensen, 1991).

Theater activities can be designed to create numerous opportunities for student participation. For example, in a scripted role play (Savignon, 1997), a child would have as many opportunities as are provided in the script. Role playing has been suggested as an effective technique in AAC interventions to practice skills such as introduction strategies or asking partner-focused questions (Light & Binger, 1998). Simulation and improvisation have also been used to encourage students to spontaneously generate messages in a given framework in second-language learning activities (Livingstone, 1983; Savignon, 1997). A teacher or facilitator can ask open-ended questions to help children imagine and participate in an improvised situation (Savignon, 1997).

Merely having opportunities to participate, however, is not enough. It is also critical that students experience high rates of success when they are participating. Success rates of 80% or above during students' work, answers, and classroom participation have been correlated with higher levels of student achievement (Berliner, 1985). High success rates can also improve students' self-esteem and promote higher levels of intrinsic motivation (Eggen & Kauchak, 1994). High rates of success in theater arts can be guaranteed because theater activities support open-ended imagination and creativity rather than restrictive "right and wrong" answers (Herman & Smith, 1988). In effect, when students are participating in a theater task, they are highly likely to experience success and enjoyment.

Given the potential benefits of theater arts for children who use AAC and the lack of research to date, a preliminary study was undertaken to show the value of theater activities as a context for interventions in settings that included children who used AAC and their nondisabled peers. Specifically, the study investigated the following research questions: (a) Do theater arts activities encourage high levels of engagement across children who participate in the activities (AAC users and nondisabled peers)?, (b) Do theater arts activities provide frequent opportunities for communication?, (c) Do children who use AAC and nondisabled children fulfill these opportunities for communication?, and (d) Do children who use AAC
and nondisabled children fulfill these opportunities for communication with high levels of success?

**METHOD**

**Participants**

Professionals at a university-based speech and hearing clinic and in elementary schools in the surrounding area were contacted via telephone and/or in writing to inform them of the study’s goals and procedures and to invite them to participate. They were asked to identify children in their program who met the selection criteria. A letter was then forwarded to the children’s parents outlining the study’s goals and procedures and inviting their children’s participation. Follow-up telephone calls were made to all interested parents to describe the study’s goals and procedures in detail and to answer any questions the parents had.

Children who used AAC were selected according to the following criteria: (a) they were between 6 and 10 years of age; (b) they had no known history of challenging behaviors; (c) they had severe communication disabilities such that their speech was inadequate to meet their communication needs; (d) they had AAC systems in place; (e) their levels of cognitive functioning were such that they could engage in imaginative play, as determined by parent reports, home observation, criterion-referenced elicitation tasks, and each child’s Individualized Education Plan (IEP); and (f) they demonstrated the ability to communicate about displaced concepts and the perspectives of others, as determined by play-based observations, parent reports, and information from school personnel.

The nondisabled children were selected according to the following criteria: (a) they were between 6 and 10 years of age, (b) they had no known delays in receptive and expressive language skill development, (c) they had normal or corrected vision and normal hearing and motor skills, and (d) they had no known history of challenging behaviors as determined by parent report.

The two AAC users who participated in the study were George, a 7-year-old boy with alternating hemiplegia of childhood, and Beth, a 7-year-old girl with severe spastic cerebral palsy. A summary of the communication, cognitive, and physical skills of these children is displayed in Table 1.

George’s vision and hearing were reported to be within normal limits. According to evaluations using different-sized matrices and parent and school personnel report, George was able to access a communication display of 20 items (0.5 × 0.5 in) using direct selection with his right index finger or thumb. George could crawl independently and walked with assistance. He used a stroller with adult assistance for mobility. George attended a self-contained classroom for children with multiple disabilities. According to structured observations, criterion-referenced elicitation tasks, and reports from parents and school personnel, George could follow one- and two-step commands with 100% accuracy and could answer yes/no, who, where, and “what-doing” questions with 100% accuracy.

George communicated via speech approximations (11 words were understandable to familiar and unfamiliar partners), gestures, pointing, light-technology communication boards (e.g., communication boards with Picture Communication Symbols used to express needs and wants in a classroom setting), eye pointing, and the DynaMyte®, a computer-based VOCA with a dynamic display using the DynaSyms® symbol system. George was able to independently navigate 80 different pages on his computer-based VOCA. The pages were organized according to (a) activities at school (e.g., circle time, music, calendar), (b) activities done with particular people (e.g., speech-language therapy, occupational therapy, physical therapy), (c) activities done at home (e.g., television programs, computer), (d) food and drink items, (e) personal and emergency information, and (f) jokes or other “fun” vocabulary (e.g., vocabulary to facilitate playing games). Most messages on his VOCA were full sentences retrieved by selecting a single icon (e.g., “My head hurts”). Some pages contained items with carrier phrases to be used with other items on a page (e.g., “I would like...” “Today is...”).

Beth, the other AAC user who participated in the program, was farsighted; however, her vision was within normal limits when she wore corrective lenses. Beth’s hearing was within normal limits, she had limited range of movement in her arms, and she was able to localize one finger to point to desired items.

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1 Alternating hemiplegia of childhood is a rare neurologic disorder in which weakness and/or total paralysis alternate between one side of the body and the other. The weakness can vary in intensity and duration. Symptoms of alternating hemiplegia of childhood may also include temporary paralysis of eye movement, involuntary facial and limb movement, excessive sweating, and fluctuation of body temperature and skin color. The symptoms generally appear before 18 months of age. The cause of the disorder is unknown, although in some cases it has been attributed to a hereditary genetic trait (National Organization for Rare Disorders, Inc., 1999).

2 Picture Communication Symbols include approximately 3,000 line drawings representing a range of concepts. They are available from the Mayer-Johnson Co., P.O. Box 1579, Solana Beach, CA 92075-7579, USA. Tel: 800-588-4548; Website: http://www.mayerjohnson.com/.

3 The DynaMyte is a small, portable, computer-based, dedicated AAC system that uses a liquid crystal, touch-sensitive display with voice output via DECTalk™ synthesized speech. The display screen is 5 1/4" x 3 1/4". The DynaMyte is available from DynaVox Systems Inc., 2100 Wharton St., Suite 400, Pittsburgh, PA 15203, USA. Tel: 800-344-1778; Website: http://www.sentient-sys.com/.

4 DynaSyms is a line-drawn, rule-based symbol system. Some of the symbols can be animated on Sentient Systems products. Website: http://www.sentient-sys.com/.
According to informal evaluations using different-sized matrices and parent and school personnel report, Beth was able to access a display of eight items (2 × 2 in) on her VOCA. However, she had difficulty moving away from midline and would sometimes require assistance from others to do so. Positioning and accessing were often challenges; Beth was not able to ambulate independently, and she used a manual wheelchair.

Beth attended a self-contained classroom for children with multiple disabilities part time and a first-grade class part time. According to structured observations, criterion-referenced elicitation tasks, and reports from parents and school personnel, Beth followed one-, two-, and three-step commands with 100% accuracy; was able to identify all letters of the alphabet; and responded to who, "what doing," what, where, and when questions with 100% accuracy. Beth communicated via gestures, facial expressions, light-technology communication boards (e.g., three- to eight-item boards with Picture Communication Symbols used in classroom activities to respond to questions about shapes, colors, numbers, and people and to communicate about activities of daily living), vocalizations, speech approximations, eye pointing, and a DynaVox 2c, a computer-based VOCA with a dynamic display and the DynaSyms symbol system. Reports from Beth’s classroom teachers indicated that her use and accuracy of spoken word approximations were increasing. Beth’s speech was unintelligible to unfamiliar listeners.

The pages on Beth’s VOCA were organized according to activities at home (e.g., playing with Spin Art, watching videos) and at school (e.g., calendar, colors, and names of children in her classroom). Beth’s classroom aid reported that, due to access problems, Beth needed assistance with navigating through the pages on her VOCA. For example, Beth would often unintentionally activate choices when attempting to select other vocabulary items. Most messages on her VOCA were full sentences programmed under a single icon (e.g., “Let's play Spin Art,” “Let's watch a video”). Some pages contained items with carrier phrases to be used with other items on a page (e.g., “I want to work with...”). Beth was reported to be able to combine two icons to communicate messages. Her multiple-icon messages tended to be attribute-object messages (e.g., “yellow hair,” “big circle”).

Three nondisabled children also participated in the theater arts program: Emma (8 years old), Cathy (8 years old), and Lisa (8 years old). They all had hearing and vision within normal limits and no known delays in receptive and expressive language skills. Cathy and Lisa had no previous experience with individuals using AAC. Emma was Beth’s neighbor and knew Beth prior to involvement in the theater program.

### Description of the Theater Arts Program

The program was held five mornings a week from 9 AM to 12:00 noon over a 2-week period during the summer. Each day’s schedule included activities selected from a bank of activities that employed the theater arts techniques of ensemble building, pantomime, unscripted role play, and scripted role play (Savignon, 1997). Table 2 lists all activities, their goals, and their basic procedures. Enrichment activities (e.g., word association games, mirroring the physical movements of a partner) were also offered periodically to provide additional challenges for Emma, Cathy, and Lisa. All of the children also participated in

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**TABLE 1: Demographic Information on the Children Who Used AAC**

<table>
<thead>
<tr>
<th>George</th>
<th>Beth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>7</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Alternating hemiplegia of childhood</td>
</tr>
<tr>
<td>Comprehension skills</td>
<td>1- and 2-step commands (100% accuracy)</td>
</tr>
<tr>
<td>Yes/no, who, “what doing,” what, where questions with 100% accuracy</td>
<td>Yes/no, who, “what doing,” what, where, when questions with 100% accuracy</td>
</tr>
<tr>
<td>Educational placement</td>
<td>Self-contained classroom</td>
</tr>
<tr>
<td>AAC systems</td>
<td>Speech approximations, gestures, pointing, facial expressions, communication boards, DynaMyte</td>
</tr>
<tr>
<td>Access</td>
<td>Able to direct select with finger/thumb in a display of 20 items (0.5 × 0.5 in)</td>
</tr>
</tbody>
</table>

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5The DynaVox 2c is a computer-based, dedicated AAC system that uses a liquid crystal, touch-sensitive display with voice output via DECTalk synthesized speech. The display screen is 8” × 6”. The DynaVox 2c is manufactured by DynaVox Systems Inc., 2100 Wharton St., Suite 400, Pittsburgh, PA 15203, USA. Tel: 800-344-1778; Website: http://www.sentient-sys.com/.
daily arts and crafts and snack activities; however, data were not collected during these activities. Personnel were three graduate student clinicians, one clinical supervisor, and one undergraduate student who operated the video camera. One of the graduate student clinicians led the large-group activities; the other two were each assigned to small groups, when such activities took place. The clinicians were aware that their participation was part of a study into an integrated theater arts program, but they were unaware of any of the specific variables being measured.

To maintain variety within repeated activities, expose the children to a wide range of vocabulary and situations, and keep the children interested and motivated, the specific content of the activities revolved around changing themes: the beach, the farm, royalty/fairy tales, and outer space. Three days were devoted to the first theme, and each subsequent theme continued over a 2-day period. The final day was an open house day that involved all of the themes.

**Vocabulary**

To ensure that George and Beth had the necessary vocabulary to participate fully within the theater arts program, specific vocabulary was selected for each theme (Appendix) as a means of supplementing the personal vocabulary already available in Beth’s and George’s AAC systems. Vocabulary items were represented on George’s and Beth’s computer-based VOCA using DynaSyms, with a written word above each symbol to maintain consistency with their systems. The maximum number of items programmed on a page was eight, with most pages having six to seven items. The items were approximately 2 × 2 in size to accommodate the children’s accessing needs.

Light-technology systems were also provided. These included black and white printouts of the pages on George’s and Beth’s computer-based VOCA and hand-drawn symbols for required vocabulary that was not programmed into systems. New vocabulary was added as the need arose.

**Data Collection Procedures**

Data were collected from repeated viewings of videotapes that were shot by a camera that was positioned in front of the group and moved as necessary when an adult obstructed the camera’s view. Twenty 10-minute samples were analyzed, two from each day of the program (a total of 200 minutes). Samples were chosen to reflect the range of activities covered in the program, including large- and small-group activities.

**Measures**

Four measures were analyzed: time engaged, opportunities for communication, fulfillment of these opportunities, and success in communication. The measures were chosen to reflect the elements of effective instruction (Berliner, 1985).

**Time Engaged**

How long the children were engaged in theater activities was measured to determine the extent of their attention to and involvement with the activities. The definition of time engaged was developed post hoc, based on the definitions used in various studies of children with disabilities (e.g., Hollowood et al., 1994; Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994; Logan et al., 1997; Sindelar et al., 1986). A child was considered engaged if she or he was (a) responding to a direct question posed by an adult or other student; (b) offering a comment, shared experi-

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**TABLE 2:** List of the Theater Arts Activities and Their Corresponding Goals and Procedures

<table>
<thead>
<tr>
<th>Activity</th>
<th>Goal</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>I See</td>
<td>Learn new nouns and phrases</td>
<td>Adult gives setting and asks “What do you see?”; children move or act like what is seen. Or, each child takes a turn driving a magic bus and the adult asks “What do you see?”; children move or act like what is seen.</td>
</tr>
<tr>
<td>You’re in Charge</td>
<td>Give commands/follow commands</td>
<td>One person in the middle of the group gives commands others must act out or follow.</td>
</tr>
<tr>
<td>Writer’s Workshop</td>
<td>Write basic story sequences</td>
<td>Adult facilitator provides scaffolding for collaborative work. Children act out the story when done.</td>
</tr>
<tr>
<td>Act Out</td>
<td>Use communication modes other than natural speech</td>
<td>Adult gives hypothetical scenario and children act it out using multiple modalities.</td>
</tr>
<tr>
<td>Reporting Live</td>
<td>Ask and answer questions</td>
<td>One child chooses an animal or thing to be, others ask questions to discover what it is. Done in pairs or as a group.</td>
</tr>
<tr>
<td>Group Activity</td>
<td>Socialize with others; move with others in a group</td>
<td>Moving in a circle in different ways, making a web, breaking apart, and coming back together.</td>
</tr>
</tbody>
</table>
in one of the current imaginative settings; (c) attending to a speaker or other participant in a group activity as demonstrated by body orientation and gaze; or (d) accessing a computer-based communication device to communicate (i.e., accessing the device in any way except that would turn off or sabotage the use of the device for communication purposes). A child was considered not engaged if he or she was (a) acting in a manner that interfered with the participation of another child, (b) looking away from the speaker or other participants in a group activity, (c) communicating about unrelated topics or issues, or (d) turning off or sabotaging the use of the computer-based VOCA.

In some situations, it was unclear whether a child was accessing a communication device to take part in or to avoid an activity. In these situations, a separate code (an “access question”) was used if George or Beth was either activating a message on a different page from the one directly associated with the activity or navigating through the pages. If there was direct evidence from a clinician that the navigation was leading toward turning off or sabotaging the use of the device, the segment was coded as “not engaged.”

Time engaged was analyzed by time sampling using a 10-second interval. Suen and Ary (1989) recommended that the interval size in time sampling be small enough to ensure representativeness of the sample yet not so small that coding becomes physically difficult. An observer viewed the video samples five times to code each child separately. Every 10 seconds during each viewing, the observer viewed the target child and coded whether the child was engaged, if there was a question as to the intent of the child’s access to his or her AAC system, or if the child was out of view. To ensure measurement reliability, the specific starting time for each segment was noted on a videotape recorder timer. The same videotape recorder was used for all analysis.

The “play” buttons on the videotape recorder and the audiotape recorder were pressed simultaneously. The audiotape recorder contained 10 minutes of tape and included a tone that sounded every 10 seconds. The same audiotape recorder and tape were used for all measurements. All data were summarized for each child separately, with time engaged calculated by dividing the number of times a child was engaged by the total number of observed intervals in which the child was in view. Some children were not visible on the videotape at all times because of the size of the group, camera position, and limited camera angle. Children who were out of view during samples were noted and not included in the analysis.

Each activity had 60 intervals for analysis. The total number of intervals for 20 activities was 1,200. The children were “out of view” for a mean of 241 intervals (20%), ranging from 191 intervals (16% of the total sample) for Cathy to 329 intervals (27% of the total sample) for Lisa. Even with the omission of “out of view” segments, the data analyzed were still based on sufficiently large samples of interactions (mean = 959).

### Opportunities for Communication

The definition of opportunities for communication was developed post hoc based on the literature (e.g., Light, Binger, Agate, & Ramsay, 1999) and on the interaction styles in the program. In general, the researcher and the clinicians guided activities and elicited the majority of communicative turns. Opportunities for communication occurred following (a) direct questions addressed to a specific person (e.g., “What should we do now, Beth?” would be one opportunity for Beth), (b) questions to the group (e.g., “What else do they have on a farm?” would be one opportunity for everyone in the group), (c) any spontaneous comment directed to an individual or to the group (e.g., Cathy said, “One time, I went to the beach and got some shells”), and (d) an extended pause (greater than 10 seconds).

Because of the infrequent number of opportunities children who use AAC have for communication in general (Light et al., 1985), and because a time sampling measure might be skewed because of increased accessing time for individuals using AAC, a measure that captured the frequency of opportunities was determined to be more appropriate for this study. An observer viewed all interactions selected for analysis and coded for each child the total number of opportunities for communication within each of the 10-minute samples. Frequencies of opportunities for communication were calculated for each child, for each activity.

### Fulfillment of Opportunities

Fulfillment of a communication opportunity was defined as any purposeful act (e.g., eye gaze, facial expression, gesture, vocalization, high-technology voice output, light-technology access) performed spontaneously or in response to a communicative turn issued that was initiated by someone else. Children were coded as fulfilling an opportunity if they (a) initiated appropriately, (b) responded to a question, or (c) acted something out. The following situations were not coded as fulfilled opportunities for communication: (a) a child’s exact repetition of someone else’s question (unless the purpose was for clarification), (b) any communication unrelated to the activity (e.g., Lisa says quietly to one of the clinicians, “It’s hot in here,” during the explanation of an activity), (c) prompts from peers or repetitions of the clinician’s questions by peers (e.g., the clinician asks, “What should we do now, Beth?” and Emma prompts, “What should we do now, Beth?”), (d) any communication to confirm a choice (e.g., after Beth selects “pig,” the clinician asks, “We should be pigs?” and Beth answers, “Yes.”). For each communication opportunity for each child, the researcher coded whether the child fulfilled the opportunity (with facial expression, eye pointing,
Success of Communication

Because theater activities generally do not have right or wrong answers (Herman & Smith, 1988), successful communication was largely dependent on children fulfilling communication opportunities and having someone respond to or acknowledge the attempt. A communicative act issued by a child was considered successful if an adult or a peer responded to the act (e.g., children feed animals after a message to do so, children run away after Beth says she saw an alien) or acknowledged the act (e.g., “Yes, you could see that at the beach,” “We’d better get out of here, then”). A communicative act was coded as unsuccessful if no one responded to the act (e.g., Beth says, “Feed” for feed the animals, but the others do not understand and do not follow her instruction) or no one acknowledged the act (e.g., Beth says, “That was fun,” and looks at the clinician, but the clinician did not hear or acknowledge her). The percentage of successful communication acts was calculated by dividing the number of successful acts by the total number of acts for each child.

Reliability

At least 20% of the samples across children and activities were randomly chosen and coded by a separate trained observer to determine the reliability of each of the measures. Interobserver agreement was determined by calculating the number of agreements divided by the number of agreements, disagreements, and omissions. Reliability of the data was as follows: a mean of 90% agreement for time engaged (range of 77% to 100%), a mean of 87% agreement for opportunities for communication (range of 78% to 92%), a mean of 84% agreement for fulfillment of opportunities by the children (range of 74% to 90%), and a mean of 84% agreement (range of 70% to 100%) for success of the children’s communication.

RESULTS

Time Engaged

All children were highly engaged across the range of theater activities. For the children using AAC, engagement was reported as a range. This range was determined by first considering instances when the child was accessing an AAC system without a known result as unengaged behavior and then by considering it as engaged behavior. The results were as follows: 78% to 94% engaged time for George and 87% to 88% engaged time for Beth. Therefore, George was accessing his AAC system without a known result for 16% of the total time sampled; Beth was accessing her AAC system without a known result for 1% of the total time sampled. The results for the engaged time of the nondisabled children were 88% for Emma, 88% for Cathy, and 93% for Lisa.

Opportunities for Communication

Mean frequencies of opportunities for communication per 10-minute activity for each child are displayed in Figure 1. George and Beth, the two children using AAC, had the highest frequencies of opportunities to communicate. George had a mean of 14 opportunities per 10-minute activity (SD = 7), whereas Beth had a mean of 16 opportunities (SD = 6). The three nondisabled children also had frequent opportunities for communication in the 10-minute activities. Emma had a mean of 12 opportunities (SD = 6), Cathy had a mean of 13 (SD = 6), and Lisa had a mean of 8 (SD = 4).

Fulfillment of Opportunities

As can also be seen in Figure 1, all of the children fulfilled more than 70% of the opportunities provided for communication. George fulfilled 78% of his opportunities per 10-minute activity, and Beth fulfilled 81% of hers. Two of the nondisabled children (Emma and Cathy) had the highest percentages: 88% and 90% of opportunities, respectively. Lisa, the third nondisabled peer, had the lowest percentage of fulfilled opportunities at 72%.

Success of the Children’s Communication

The mean number of successful communicative turns for each child that were successful is displayed in Figure 1. All of the nondisabled children were successful in every fulfilled communication opportunity (a mean of 11/11 for Emma and Cathy and 5/5 for Lisa per 10-minute activity). George and Beth were each unsuccessful in one communication opportunity on average (10/11 for George and 12/13 for Beth per 10-minute activity). The nondisabled peers experienced slightly higher rates of success (100%) than the children using AAC (mean greater than 90%), but all of the participants experienced high levels of success.

DISCUSSION

The results of the present study suggest that theater arts activities are an effective instructional milieu for communication intervention with children who use AAC and their nondisabled peers.

Time Engaged

Time Engaged for AAC Users

Unfortunately, there are no data to compare the levels of engagement observed in this study with those
in other theater-based interventions in integrated settings. The levels of engagement for the AAC users (78% to 94% for George, 87% to 88% for Beth) seem comparable with levels of engagement reported by other researchers studying students with severe disabilities in classroom-based settings (e.g., Hollowood et al., 1994; Hunt et al., 1994; Logan & Keefe, 1997). It should be noted, however, that the definition of what constituted engagement in the current study was broader than in the classroom-based studies because theater activities may promote learning whether the communicator is directly communicating with or is listening and preparing to respond to others (Livesstone, 1983). Listening and direct communication were treated separately in the classroom-based studies, but if combined into one measure, the results from Logan and Keefe (1997) would show that children with disabilities were engaged 95% of the time when using a definition of engagement that was similar to the one used in the current study. The differences in expectations and tasks still make direct comparisons with classroom-based results difficult.

**Figure 1.** Mean number of opportunities, opportunities fulfilled, and opportunities fulfilled successfully for the five children per 10-minute activity.

**Opportunities for Communication for the Children**

Unfortunately, the classroom studies that have examined children’s engagement in integrated settings did not report the number of opportunities the children had to communicate—something that is especially important because individuals using AAC are often placed in passive roles in conversations (Light et al., 1985) and may be preempted from opportunities to communicate (Calculator, 1988).

The results of the present study demonstrate that all children had frequent opportunities to communicate at a rate of approximately one opportunity per minute in each activity. Of particular note is that the AAC users had more opportunities to communicate than their nondisabled peers; one possible explanation may be that the clinicians tended to offer the children who used AAC more opportunities for communication. Furthermore, because of the high clinician-to-child ratio,
a clinician was often sitting with an AAC user and may have provided additional opportunities that the nondisabled children might not have had.

Of the three nondisabled peers, Emma and Cathy had more opportunities to communicate than did Lisa; one possible explanation could be that Emma and Cathy tended to seek out more opportunities for communication (e.g., by raising their hands and/or offering additional information), or, perhaps because Lisa tended to be a less talkative individual, she had the fewest opportunities for communication.

**Fulfillment of Opportunities by the Children**

In the current study, the children using AAC fulfilled a high percentage of their opportunities for communication. Light et al. (1985) suggested that younger children who use AAC only fulfilled half of their opportunities for communicative turns. However, the researchers also noted that these younger children were more likely to respond in situations where a response was required (Light et al., 1985). In the current study, responses were often required (e.g., the clinician said, “Beth, what do you see at the beach?”) rather than optional (e.g., an extended pause after holding up a seashell).

Although the children using AAC were given more opportunities for communication than their nondisabled peers, two of the nondisabled children (Emma and Cathy) fulfilled more of the communication opportunities they were given than the AAC users. This could have been because Cathy and Emma fulfilled more of the opportunities that were offered to the group as a whole. Lisa fulfilled the fewest number of opportunities, and, again, this may have been the result of her less talkative style.

**Success of the Children’s Communication**

Berliner (1985) indicated that high achievement was correlated with children experiencing success 80% of the time. All of the children in the current study experienced levels of communication success well beyond 80%, although the broad definition of success may have contributed to the high percentages of success in opportunities for communication. Because the goal of the theater activities in the current study was for children to communicate, imagine, and explore new vocabulary, the definition of success reflected these goals.

Eggen and Kauchak (1994) reported that success is a highly important factor in learning. Not only does success lead to skill acquisition, but it is also motivating. Children are motivated by success and will tend to participate more in activities in which they are experiencing success (Eggen & Kauchak, 1994). Theater activities may help to encourage children who are reluctant communicators or who have abandoned communication attempts because of repeated perceived failures.

**Clinical/Educational Implications**

The results of the current study suggest that theater may be an effective medium for teaching communication skills to children who use AAC and their nondisabled peers. Theater activities are flexible enough to support thematic units in schools so that including classroom material and goals may help to generalize skills fostered through theater activities into classroom activities. Through theater activities, children can explore new vocabulary and concepts and have the chance to be in situations they might not otherwise encounter. Furthermore, the interactive design of theater activities provides a break from traditional recitation styles of teaching. Such a method is especially important for children who use AAC because they have less access to leisure activities (Dattilo, Light, St. Peter, & Sheldon, 1995).

Although the current study was designed for children without significant cognitive impairments, the activities are flexible enough to include children who use AAC and have cognitive impairments. However, it may be necessary to adapt the activities so that they are more concrete, visual, and less tied to imaginative contexts, depending on the level of impairment.

The high levels of engagement, participation, and success across children lend support to the use of theater activities in integrated settings—an approach that may provide a nontaxing way to help integrate children using AAC and their nondisabled peers.

**Limitations of the Study and Future Research Directions**

There are several limitations that should be considered when interpreting the results of the current study. For one, an experimentally controlled design was not employed to evaluate changes in communication by the children as a result of the theater program. As a result, it is not possible to make definitive statements about the specific effect of theater arts on the children’s language and communication learning. Future research should include controlled studies to evaluate these changes, with a larger number of children. In addition, it will be important to explore the effectiveness of theater as a medium for communication intervention with children who have other types of disabilities.

In addition, there were times during videotaping that the children were out of view; therefore, it is possible that they may have been less engaged than reported. Also, the samples chosen for analysis were selected on the basis that they reflected the variety of activities and to represent at least two activities from each day. The choice of samples was at times limited because of an incomplete videotape or the lack of a full 10-minute sample. However, it should be noted that the results reflect analyses of at least two samples of interaction every day for 10 days (approximately 200 minutes of communication interaction), a “large” com-
communication sample when compared to most research studies.

Clearly, there is a lack of research on theater arts and children who use AAC in integrated settings. More research into this area is needed, based on the positive results of this preliminary study and because of the potential benefits for both children using AAC and their nondisabled peers. Future research should include studies to evaluate the effect of theater arts activities on (a) social interaction between children who use AAC and their nondisabled peers, (b) initiations by children who use AAC, (c) nonobligatory turns fulfilled by children who use AAC, and (d) the relationship between teaching effectiveness variables and changes in communication patterns. Future research should also consider the effectiveness of theater arts activities carried out part time throughout an entire school semester or school year and the effectiveness of theater arts activities with different populations of children with disabilities.

There are many potential applications for theater arts activities in integrated settings with children who use AAC. These activities offer multiple social and teaching opportunities that may enhance social skills, promote communication skills, and facilitate creative expression in AAC users and their nondisabled peers.

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REFERENCES


APPENDIX: List of Vocabulary Used for Each Theme

<table>
<thead>
<tr>
<th>Theme</th>
<th>Activity</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach</td>
<td>Act Out</td>
<td>I feel, you feel, happy, sad, scared, surprised, angry, yucky, wet, dry, sunburned, hot, cold, tired</td>
</tr>
<tr>
<td></td>
<td>I See</td>
<td>I see, a lobster, a crab, a sandcastle, a dolphin, an octopus, a clam, a fish, a shark, waves, a mermaid, seaweed, a sea monster, lemonade, sunglasses, a starfish, a beachball</td>
</tr>
<tr>
<td></td>
<td>You're in Charge</td>
<td>Swim, dive, kick, fish, float</td>
</tr>
<tr>
<td></td>
<td>Reporting Live</td>
<td>Where do you live?, What do you eat?, What do you like to do?, How big are you?, How do you move?</td>
</tr>
<tr>
<td></td>
<td>Comments</td>
<td>Oh no, Great, Me too, That was fun, I don't like this, Oh wow, Cool, That's too bad, I don't have a way to say that</td>
</tr>
<tr>
<td>Farm</td>
<td>Act Out</td>
<td>I feel, you feel, happy, sad, scared, surprised, angry, yucky, dirty, stinky, itchy, hot, sleepy, tired</td>
</tr>
<tr>
<td></td>
<td>I See</td>
<td>I see, a cow, a chicken, a horse, a pig, a dog, a cat, a duck, a goat, a mouse, a sheep, a barn, a fence, a tractor, a pick-up truck, a hoe, a shovel, corn, tomatoes, hay, dirt</td>
</tr>
<tr>
<td></td>
<td>You're in Charge</td>
<td>Plant, fly, feed the animals, crawl, gallop, milk the cows, gather the eggs, hoe</td>
</tr>
<tr>
<td></td>
<td>Reporting Live</td>
<td>Where do you live?, What do you eat?, What do you like to do?, How big are you?, How do you move?</td>
</tr>
<tr>
<td></td>
<td>Comments</td>
<td>Oh no, Great, Me too, That was fun, I don't like this, Oh wow, Cool, That's too bad, I don't have a way to say that</td>
</tr>
<tr>
<td>Royalty/ fairy tales</td>
<td>Act Out</td>
<td>I feel, you feel, happy, sad, scared, surprised, angry, funny, rich, lucky, proud, pretty, proper, powerful</td>
</tr>
<tr>
<td></td>
<td>I See</td>
<td>I see, the king, the queen, a princess, a prince, jewels, a sword, a crown, a dragon, an alligator, a moat, the royal throne, a jester, a carriage, a horse, an arrow, a bow, Merlin the Magician, servants, a knight, an army</td>
</tr>
<tr>
<td></td>
<td>You're in Charge</td>
<td>Sip the tea, clean the castle, wave at the people, bow to the king, dance at the royal ball, tie up the horses, fall into the moat, fight with your sword</td>
</tr>
<tr>
<td></td>
<td>Reporting Live</td>
<td>Where do you live?, What do you eat?, What do you like to do?, How big are you?, How do you move?</td>
</tr>
<tr>
<td></td>
<td>Comments</td>
<td>Oh no, Great, Me too, That was fun, I don't like this, Oh wow, Cool, That's too bad, I don't have a way to say that</td>
</tr>
<tr>
<td>Outer space</td>
<td>Act Out</td>
<td>I feel, you feel, happy, sad, scared, surprised, angry, yucky, weightless, heavy, dizzy, hot, cold, tired</td>
</tr>
<tr>
<td></td>
<td>I See</td>
<td>I see, a star, a moon, a spaceship, an alien, an astronaut, the sun, a rocket, the Earth, a telescope, the sky, clouds, the Big Dipper, a spacecoat, moonboots, a falling star, a rainbow</td>
</tr>
<tr>
<td></td>
<td>You're in Charge</td>
<td>Float, fly, moonwalk, jump, shoot, blast-off, force field up, chase</td>
</tr>
<tr>
<td></td>
<td>Reporting Live</td>
<td>Where do you live?, What do you eat?, What do you like to do?, How big are you?, How do you move?</td>
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