Play Techniques with Neurologically Impaired Preschoolers

Joyce W. Sparling

A pilot project was undertaken to study the effect of educational play as an intervention approach. The study was conducted with 14 neurologically impaired, physically handicapped preschool children, parents, community teachers, and developmental center staff. Educational play consisted of art and drama group activities presented according to the normal sequence of play development, from sensorimotor, to symbolic, to sociodramatic play. After a 7-week course of intervention, the children’s performance, as measured by items in the Vulpse Assessment Battery, improved in six areas of development. Overall improvement was statistically significant. In addition, participating adults began to value the use of play as an essential component of child development. Results suggest the need for a systematic study of play in intervention with preschool, neurologically impaired, and physically handicapped children.

Daryl F. Walker

Occupational and physical therapy intervention with the physically handicapped child is based on a combination of sensory and motor procedures. These intervention approaches are termed sensory integrative, neurodevelopmental, and sensorimotor and reflect the present level of knowledge about the developing nervous system. The highly specialized techniques of these approaches elicit adaptive responses in the child. Repetition of these responses is assumed to develop competency at one level of nervous system development and prepare the child for the next level. The purpose of this study is to explore the use of play as an activity to augment this developmental process in children limited in their play by neurological impairment.

Reports and studies of normal and neurologically impaired children suggest that play may offer an appropriate context for intervention (1-5). Occupational therapists have been vocal about the value of play in child development and have provided a philosophy and some assessments necessary for play’s application (6). It has been posited that for play to be used effectively in intervention with the preschool child, it must first be valued by parents, teachers, and therapists (7). Once interest in the value of play has been established, the present level of knowledge of play development, in concert with knowledge of the developing nervous system, should provide insights for guiding early childhood intervention.

Julie Singdahlsen

Play, an essential component of the developmental process, was used to organize an intervention program for neurologically impaired preschoolers with physical handicaps. The specific purposes of this pilot study were as follows: 1) to develop a program of sequenced sensorimotor, symbolic, and sociodramatic play activities for the preschool child, it must first be valued by parents, teachers, and therapists (7). Once interest in the value of play has been established, the present level of knowledge of play development, in concert with knowledge of the developing nervous system, should provide insights for guiding early childhood intervention.

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for impaired preschoolers; 2) to assess the effect of these activities on one group of neurologically impaired preschool children; and 3) to stimulate the development of positive community attitudes toward the educational value of play.

**Review of Literature**

Several authors (8-11) have suggested that there is a sequence that occurs consistently in normal play development. This sequence originates prior to 12 months of age, culminates at 21 months with symbolic play, and continues as sociodramatic play, as depicted in Figure 1.

Piagetian researchers (12, 13) suggest that the foundations of play in normally performing children lie in the second substage of the sensorimotor period, from 1 to 2 months of age. Play at this stage is indiscriminate, with mouthing of rattles or rings. Play becomes more directed with simple visual and manual manipulations of blocks or pegs. In functional play, the child appropriately manipulates an object, for example, spinning the wheels of a toy car. Functional is succeeded by relational play in which two objects are brought together, for example, banging two blocks together. In functional-relational play, occurring from 8 to 11 months, realistic objects are used appropriately, for example, when a child drinks milk from a cup. From 16 to 19 months, children become more centered in their activity, as observed by extension of their play beyond themselves. During this time, play becomes more complex with the possibility of sequencing several schemes rather than pretending with one scheme, for example, feeding one's self, followed by feeding a doll. From 20 to 22 months, the child is able to plan pretend activities prior to their enactment. At this point in develop-
ment, it is the child's mental representation of an act, more than any toy characteristic, which initiates play activity (14).

Present research describes symbolic play as the quintessence of the play sequence. Symbolic play is characterized by dualities (15) as follows: 1) inanimate objects are treated as animate objects (e.g., a doll is fed milk from a bottle); 2) ADL proceed without their concrete objects (e.g., the bottle feeding occurs without any real milk); 3) actions are enacted that characteristically are enacted by another person (e.g., child assumes the role of mother in bottle feeding); 4) activities are initiated but not completed (e.g., bottle feeding is short-lived and not a complete feeding); and 5) one object substitutes for another (e.g., a pencil substitutes for the bottle). Symbolic abilities observed in play are interpreted as markers of cognitive development (14, 16) and as precursors to the major language achievement of two-word utterances (9, 17). The relationship between language and play is noted also in older preschoolers whose language usage is more expressive than referential and whose play is more symbolic than realistic (8).

Sociodramatic play (18) is the logical extension of both sensorimotor and symbolic play. Through sociodrama, previously acquired play skills are practiced and applied to more complex skill development, such as solving problems, delaying actions, and attending to the requests and needs of others (19). Capability for sociodramatic play in the normal child is established by 3 years of age (9).

Although delayed, play development appears to be similarly sequenced for emotionally disturbed and Down's syndrome children (16, 20). There is no information available, however, on the sequence of play development in physically handicapped children. What is known about play development in normal children provides clinicians with a framework for the play development of physically handicapped children. Consistent findings derived from the study of play in normal children are as follows: 1) knowledge of objects through manipulation is preliminary to pretending with objects; 2) simple activities precede complex sequenced ones; 3) self-directed play precedes play with objects and people; 4) inappropriate object behavior precedes appropriate object behavior, which precedes pretend object behavior; and 5) representational play progresses, with pretend objects becoming more distant and dissimilar than the objects they represent (9). These findings were organized into a rationale to support the play intervention used in this study and described as "educational play."

Educational play consists of two intervention techniques: educational drama (ED) and educational art (EA). Essential to each technique is the philosophy that process rather than product is the critical factor for the preschool child (21, 22). The process consists of identifying situations, objects, and persons, then learning to react to them in a way that is adaptive. Educational art is the adaptive process used in creating a graphic product. The emphasis is on the creative process through the unique manipulation of these objects. Emphasis is not on the product itself. In this study, the developmental sequence in drawing and using colors and shapes was combined with the sensorimotor stages of play development. Opportunities were provided for reaching and grasping along with material exploration, manipulation, and combination.

Educational drama is an intervention technique with drama as its focus. The essence of drama is conflict or contradiction. Conflict describes a state of imbalance when two or more persons have contradictory wants or needs. Participation in dramatic activities attempts to resolve this conflict, whether it be deciding where to go on a scooter board or what to wear to school. Educational drama is defined as a process through which conflict is recreated, permitting imitation of one's own and others' experiences to resolve the contradiction and foster adaptation. These objectives are achieved through interaction with other people.

Educational drama and educational art were systematically designed for presentation to a preschool population of impaired children. The hypothesis of the study was that young, neurologically impaired, physically handicapped children would improve in cognitive, language, social-emotional, and motoric development through art and drama intervention presented according to the developmental sequence of play.

Methodology
Subjects. Fourteen neurologically impaired, physically handicapped children, who made up the total population of a United Cerebral Palsy Developmental Center in North Carolina, were the subjects of this pilot project. Information related to them is given in Table 1. The mean chronological age was 4.55 years (SD = .98). Eight
### Table 1

**Description of Subjects**

<table>
<thead>
<tr>
<th>Child</th>
<th>Sex</th>
<th>Chronological Age</th>
<th>Mental Age</th>
<th>Diagnosis</th>
<th>Attendance</th>
<th>Number of Siblings</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ED</td>
<td>EA</td>
<td>Mother</td>
</tr>
<tr>
<td>1</td>
<td>F</td>
<td>3.1</td>
<td>Avg</td>
<td>Spastic (moderate)</td>
<td>5/7</td>
<td>5/7</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>3.7</td>
<td>EMR</td>
<td>Myelo-meningocele</td>
<td>7/7</td>
<td>7/7</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>3.6</td>
<td>TMR</td>
<td>Spastic (severe)</td>
<td>5/7</td>
<td>5/7</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>3.7</td>
<td>Avg</td>
<td>Spastic (moderate)</td>
<td>7/7</td>
<td>7/7</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>3.4</td>
<td>Avg</td>
<td>Tension athetoid</td>
<td>7/7</td>
<td>7/7</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>4.0</td>
<td>TMR</td>
<td>Multiply handicapped</td>
<td>7/7</td>
<td>3/7</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>4.7</td>
<td>Avg</td>
<td>Athetoid (severe)</td>
<td>7/7</td>
<td>6/7</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>5.2</td>
<td>Avg</td>
<td>Spastic (severe)</td>
<td>5/7</td>
<td>5/7</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>5.8</td>
<td>EMR</td>
<td>Spastic (moderate)</td>
<td>5/7</td>
<td>5/7</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>5.5</td>
<td>Avg</td>
<td>Athetoid (severe)</td>
<td>6/7</td>
<td>6/7</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>4.4</td>
<td>Avg</td>
<td>Muscular dystrophy</td>
<td>6/7</td>
<td>6/7</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>6.1</td>
<td>TMR</td>
<td>Spastic (severe)</td>
<td>7/7</td>
<td>7/7</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>6.0</td>
<td>EMR</td>
<td>Spastic (moderate)</td>
<td>2/7</td>
<td>2/7</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>4.5</td>
<td>TMR</td>
<td>Seizure disorder</td>
<td>5/7</td>
<td>0/7</td>
<td>1</td>
</tr>
</tbody>
</table>

ED, educational drama; EA, educational art. Mental age: Avg, average 90–110; BRD, borderline 70–90; EMR, educable mentally retarded 52–70; TMR, trainable mentally retarded, below 52. Education: 1, grade school attendance; 2, high school attendance; 3, college attendance; 4, graduate school attendance. * Mothers attending course.

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Children were severely impaired, and six were moderately impaired. There was a range in mental age from trainably mentally retarded (under 52) to average (90-110) as determined by two standardized intelligence tests: the Columbia Test of Mental Maturity (23) and the French Pictorial Test (24). Inability to respond motorically or to maintain attention prevented the completion of standardized testing for subjects 3, 5, 6, 12, and 14. Intellectual designations for these five subjects were derived from nonstandardized test performance and subjective staff ratings.

Adult participants in the presentation of ED and EA included three groups: nonworking parents (n = 3), staff members (n = 8), and teachers and therapists from community schools (n = 7). All parents were invited to attend. Those parents able to participate in the sessions played with children other than their own in one-to-one situations. To encourage teacher participation, teachers received continuing educational credits, mandatory for continued teaching in this state, for participation in this program. Teacher participation also supported transitional mainstreaming activities between the developmental center and the public school.

**Instrumentation.** The Vulpe Assessment Battery (Vulpe) (25) as-
sesses the following six areas: gross motor, fine motor, language, cognition, ADL, and social-emotional development. For each item, the Vulpe uses a 7-point Performance Analysis Scale ranging from 1, in which no attention to task is noted, to 3, in which physical assistance is required to participate in task, to 7, in which transfer of task to a different setting has occurred.

The Individual Educational Plan (IEP) objectives of each child were used to identify which skills would be assessed. These objectives had been established prior to this study and met the requirements of the local public school system. The IEP format and the transdisciplinary framework in which it was presented have been previously discussed (26) and describe the context of this study.

A questionnaire consisting of 20 questions was designed to tap knowledge of child development and attitudes toward play in terms of art and drama. The art/drama questionnaire was used to document perceived changes in knowledge and attitudes as a possible result of the intervention and to record anecdotal comments of participating adults. Responses were in written narrative format and were intended to be qualitatively discussed and provide further information to triangulate on the play of impaired children. The questions were appropriate to the educational level of the participating adults. Pretesting with the art/drama questionnaire on three adults uninvolved in the intervention elicited varying levels of knowledge and attitudes about the value of play in development.

Procedure Testing. Each child’s annual total Vulpe results were used prior to the initiation of the study to establish IEP objectives for each child. These objectives were the performance criteria on which pretesting and posttesting were based. Performance of these objectives was measured 1 day prior to the initiation of the project and 2 days after termination of the project by three Vulpe test items appropriate to the objective. The objectives were different for ED and EA, and thus the test items to assess them were different. The assessments were completed independently by the physical therapist, special educator, and communication specialist, all of whom were trained Vulpe assessors. This percent agreement (agreements divided by agreements plus disagreements) was 95% between raters 1 and 2, 91% between raters 2 and 3, and 88% between raters 1 and 3. Percent agreements were based on agreements within one point. During intervention the three testers worked with each of the 14 children but were not responsible for any one child.

The art/drama questionnaire was given simultaneously to the 18 adult study participants. A 9-week testing interval for children and adults was assumed sufficient to eliminate the effect of recall of past scores and performance on posttesting.

Procedure Intervention. Educational drama and educational art were presented to all students enrolled in the preschool developmental center according to the format shown in Table 2. Taken together, they describe the independent variable. All adults were active participants in the intervention. Activities were developed by the staff physical therapist and an art and a drama teacher from the local community. The teachers were minimally experienced with neurologically impaired, physically handicapped children. The IEP objectives for each child were known by the teachers and determined the selection of specific activities in both ED and EA.

Intervention was developmentally based (see Figure 1) within each session and over all sessions. Educational drama was presented in a group format weekly over a 9-week period; there were seven ED and seven EA sessions. One session was missed because of school holidays. In any one activity all 14

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-10:00 AM</td>
<td>ED group activities led by drama teacher</td>
<td>Children (14), parents (3), staff (8), teachers (3)</td>
</tr>
<tr>
<td>10:00-11:00 AM</td>
<td>ED discussion and training session</td>
<td>Adults only</td>
</tr>
<tr>
<td>1:30-2:00 PM</td>
<td>EA preparation of materials, discussion</td>
<td>Staff (8), teachers/therapist (5)</td>
</tr>
<tr>
<td>2:00-3:00 PM</td>
<td>EA one-to-one activity (led by art teacher in group format)</td>
<td>Children (13), staff (8), teachers/therapist (5)</td>
</tr>
<tr>
<td>3:00-3:30 PM</td>
<td>EA group discussion</td>
<td>Adults only</td>
</tr>
</tbody>
</table>

ED, educational drama; EA, educational art.

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children were not necessarily di-
rectly task involved because of the
children's varying cognitive, social,
and physical skills and the volun-
tary nature of participation. Vol-
untary play was achieved consist-
ently, with the children selecting if and how they would initiate or
respond. Once an idea was pre-
sented by an adult or child, it was
developed by the participants.
When attention of the majority
waned, a new but sequenced ac-
tivity was introduced.

Art was selected as an appro-
priate medium to stimulate chil-
dren of different cognitive levels
while providing necessary early
manipulative experience (27, 28).
Educational art was presented as a
sensorimotor process. For ex-
ample, printmaking was presented
in one EA session and enabled the
children to express manipulative,
functional, and relational skills.
Children used their feet or hands,
wood or string, or brushes or
brayers to make their mark on
paper. The objective was to
achieve a sustained contact with
two materials of the child's
choosing to create a unique pat-
tern. Some children moved from
printing to more advanced func-
tional-relational experience. Pen-
cils with built-up handles, large
crayons with nonrolling edges,
and brayers requiring little resis-
tance to a movement allowed chil-
dren to make their unique scrib-
bles, write their names, or draw
their pictures. The adults either
assisted the child with whom they
were working over the seven ses-
sions or created their own print as
a coplayer with the child, but they
did not make a print for a child.
No matter what the degree of par-
ticipation, the objective of the ex-
ercise was success and adaptation.
For one child, this meant making
her mark by rolling the wheels of
her scooter board over the paper-
covered floor.

Educational drama included in
its activities both the conflict es-
ternal to dramatic experience
(29–33) and the duality inherent
in pretend or symbolic play (15).
Drama was selected to provide ac-
tivities of interest to a diverse age
group, while providing necessary
early symbolic experience. Activi-
ties presented at the start of each
intervention were sensorimotor in
nature as described in Figure 1.
For example, circle objects were
shown to the group and manipu-
lated by some children. Round
shapes on one's body were noted
e.g., one child suggested bent
knees as being round), and circle
objects were visually identified
within the room. Transitional pre-
symbolic activities were then intro-
duced: a story of a magic disc en-
abled children to climb aboard
mentally and travel throughout
their community, identifying ob-
jects that were circles (e.g., one
child suggested pothole covers).
When children tired, a break
suggested in which pretend
language and in the social-emo-
tional area. Improvement scores
for individual subjects suggested
that some students improved more
in drama and some in art (see
Figure 2). Mean improvement
scores in the six areas of develop-
ment (see Figure 3) indicated that
drama had a greater effect on
gross motor, cognitive, and social-
emotional performance, whereas
ED and EA had a similar effect on
fine motor, language, and ADL.

By use of Kendall's tau-beta sta-
tistic, ED results showed a signifi-
cant association (p < .01) between
gross motor and fine motor and
between social-emotional develop-
Figure 2
Mean improvement scores for 13 DD children

Figure 3
Mean improvement scores for 6 areas of development

Results are for 13 children. EA, educational art; ED, educational drama; GM, gross motor; FM, fine motor; L, language; C, cognitive; ADL, activities of daily living; SE, social emotional.

DD, developmental disabilities; EA, educational art; ED, educational drama.

Objectives were attained and ADL, as shown in Table 3. Educational art results indicated a significant association \( (p < .05) \) between social-emotional development and activities of daily living and social-emotional development and cognition, as shown in Table 4.

Descriptive data suggest effects on children's performance due to mother's presence, number of siblings, sex, mental age, diagnosis, and parental education. These findings are suggestive and merely posit questions for further research. Three of the six non-working mothers attended the drama sessions. The improvement in their children's scores in ED when compared with EA showed individual differences. Subject 4 performed slightly better without mother present, and subjects 6 and 7 performed better with mother present. When mean scores of children with siblings \((n = 6)\) were compared with mean scores of children without siblings \((n = 8)\), performance was slightly better for those with siblings. Also, girls \((n = 5)\) scored slightly higher than
Table 3
Correlations Between Improvement Scores Within Educational Drama (Kendall’s tau-beta)

<table>
<thead>
<tr>
<th>Gross motor</th>
<th>FM</th>
<th>L</th>
<th>C</th>
<th>ADL</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>.578*</td>
<td>.012</td>
<td>.337</td>
<td>.112</td>
<td>.132</td>
</tr>
<tr>
<td>Fine motor</td>
<td>1.0</td>
<td>.209</td>
<td>1.0</td>
<td>.293</td>
<td>.399</td>
</tr>
<tr>
<td>Language</td>
<td>.012</td>
<td>.209</td>
<td>1.0</td>
<td>.355</td>
<td>.371</td>
</tr>
<tr>
<td>Cognitive</td>
<td>.337</td>
<td>.355</td>
<td>.371</td>
<td>1.0</td>
<td>.679†</td>
</tr>
<tr>
<td>Activities of daily living</td>
<td>.112</td>
<td>.293</td>
<td>.355</td>
<td>.371</td>
<td>1.0</td>
</tr>
<tr>
<td>Social emotional</td>
<td>.132</td>
<td>.399</td>
<td>.371</td>
<td>.679†</td>
<td>1.0</td>
</tr>
</tbody>
</table>

GM, gross motor; FM, fine motor; L, language; C, cognitive; ADL, activities of daily living; SE, social emotional. *p < .001. †p < .005.

boys (n = 9). Those rating average or above in mental age had slightly higher scores than those testing as educable or trainable mentally retarded, especially in EA. The effect of diagnosis, severity of impairment, and parents’ education was not clear.

The adult questionnaires were interpreted separately for art and drama. Art responses after intervention indicated a decreased hesitancy on the part of adults to vary equipment and environment to meet children’s needs and an increased awareness of the need to integrate learning domains, methods, and learning tools. Responses were permeated with comments relating to the potential for boredom within the handicapped population and the handicapped child’s need for more activity. Educational drama responses stated an increased awareness of the child’s need for play and for interaction with adults. The adults noted their increased knowledge of ways to adapt learning situations and their increased ease of relating to children with different handicapping conditions. They noted the importance of extemporaneous, improvisational activity rather than exact imitation in the teaching of physically handicapped children. Understanding the value of spontaneous enactment of an idea, along with communication through action and dialogue, was described as a major benefit of the ED approach.

Discussion
Results suggest that play in the form of EA and ED can be used to organize and provide specific intervention with the neurologically impaired, physically handicapped preschool child. Further studies must be systematically designed and implemented to validate these initial positive findings. The present research was conducted during actual clinical programming and describes a design known to be weak as discussed by Campbell and Stanley (34). Research problems in clinical settings are familiar. For example, performing under a federal grant to serve all students, a control group cannot be secured by withdrawing treatment from one-half of the subjects. Additionally, staff limitations prevented pretesting and post-testing with the full Vulpe rather than with selected items from the Vulpe. Measurement on qualitatively different items as was done in this study is the usual case when dealing with IEPs. This pilot study does suggest the potential for coordinating dyadic or group interaction with specific sensory or motor activities to enhance the child’s development and the parent’s involvement in and enjoyment of interaction. Previous research (5) has suggested that mothers of impaired children have a more positive attitude toward their children when involved in play than when interacting in therapeutic intervention. Gralewicz (35) has shown that when the therapeutic time of impaired children is added to their playtime, the composite time is equal to that spent by nonimpaired children in play. It is posited by this study that if therapy were couched in a developmentally appropriate play framework, both the child and the parent might benefit.

A further finding indicates that adult attitudes toward play were

Table 4
Correlations Between Improvement Scores Within Educational Art (Kendall’s tau-beta)

<table>
<thead>
<tr>
<th>Gross motor</th>
<th>FM</th>
<th>L</th>
<th>C</th>
<th>ADL</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>.133</td>
<td>.153</td>
<td>1.0</td>
<td>.312</td>
<td>.400</td>
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<tr>
<td>Fine motor</td>
<td>.151</td>
<td>.029</td>
<td>.312</td>
<td>1.0</td>
<td>.538*</td>
</tr>
<tr>
<td>Language</td>
<td>.071</td>
<td>.350</td>
<td>.000</td>
<td>.403</td>
<td>.465*</td>
</tr>
<tr>
<td>Cognitive</td>
<td>.274</td>
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<td>.400</td>
<td>.538*</td>
<td>1.0</td>
</tr>
<tr>
<td>Activities of daily living</td>
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<td>.403</td>
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<tr>
<td>Social emotional</td>
<td>.274</td>
<td>.110</td>
<td>.400</td>
<td>.538*</td>
<td>1.0</td>
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</table>

GM, gross motor; FM, fine motor; L, language; C, cognitive; ADL, activities of daily living; SE, social emotional. *p < .05.
enhanced in this intervention. The adult participants came to understand play as a voluntary activity that is a developmental prerequisite for other activities. It has been suggested that play must be valued as an educational tool if it is to be used effectively by parents, staff, and therapists (7). Indeed, Krathwohl et al. (36) suggest that affective and cognitive development are intertwined. Comments from the art/drama questionnaire suggested that learning specific play tasks in a developmental sequence helps adults understand and value the role of play in development.

The determining factor in obtaining positive results in intensive intervention has been suggested as the tutorial effect (87). Because intervention at this school was intensive prior to this study, most often conducted on a one-to-one basis using neurodevelopmental and cognitive/developmental approaches, and was showing less improvement on the annual Vulpe testing than in this study, this does not seem a likely rationale for these effects. The lack of improvement of one student, assumed to be due to lack of attendance, suggests that positive results were related to some aspect of intervention as opposed to maturation. Whether these short-term gains were maintained, whether improvements would be similar for EA or ED offered separately, and whether gains would be obtained with other IEP objectives on another sample of neurologically impaired children is not known.

Individual differences and preferences for intervention techniques existed with these children. Some children performed better and gained more on their IEP objectives with EA, others performed better with ED intervention. With such a small sample, it was difficult to relate these differences to any consistent source, that is, diagnosis, maternal education, or mental age. It appears that educational play offers a range of tasks that sometimes facilitates cognitive or language performance and other times stimulates gross motor or social-emotional performance.

The anticipated specific effect of drama on social-emotional development was supported, because drama’s medium is personal interaction, in contrast to the material interaction emphasized in the art process. Because some children had not attained fine or gross motor development commensurate with their cognitive status, it was anticipated that art, emphasizing earlier sensorimotor skills, might have been more beneficial for these children than drama, which emphasized later sensorimotor and preoperational play. This was not supported, suggesting the need for a wide range of activities to tap into these children’s variable performance levels. Of extreme interest was the effect of both EA and ED on language. One possible explanation is that intensive group activity is more essential to facilitating communication at this level than is one-to-one intervention. The significant interaction of ADL with social-emotional and cognitive development suggests the need to emphasize functional activities in this population. Finally, the intervention enabled adults and children to become engaged in a dialogue. This mutual exchange of thoughts, feelings, and responses (29) describes a process of verbal or nonverbal communication between learners. The essence of this approach is cooperative instruction and learning. There is no need or purpose for adults to do the work of the child. However, there is a need for adults to create an environment in which children can learn.

Conclusion
The realities of persisting primitive reflexes in concert with the reality of emerging conceptual thinking suggest the need for a comprehensive, flexible intervention technique that is developmentally appropriate for the varying performance levels of the neurologically impaired child. A pilot project was organized using developmental play techniques of art and drama to enhance cognitive, language, social-emotional, motoric, and ADL skills of neurologically impaired, physically handicapped children. Results of this pilot project suggest that educational play permits the child to gain an “holistic understanding of the world which is both a complement of and a preparation for later analytical activities” (38, p 226).

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