

Participation of Children with Autism and Nondisabled Peers in a Cooperatively Structured Community Art Program

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Abstract:

Two groups (one younger, one older) of children with autism participated in monthly art activities with same-age nondisabled peers at a children's museum. The study sought to investigate the feasibility of offering a cooperatively structured art education class for students with autism and nondisabled students, and to evaluate the effect of joint participation on the students' interactions with one another. Results indicated that both groups of children with autism were targeted for interactions front nondisabled peers significantly more often during intervention than during baseline, even though positive social interaction bids by nondisabled peers were rarely reciprocated and hardly ever initiated by peers with autism.

Article:

Various methods to promote social inclusion of students with significant disabilities, including students with autism, have been advanced in recent years. One frequently used strategy is the "Special Friends" program (Voeltz et al., 1983), which encourages the development of dyadic relationships between students with severe disabilities and nondisabled peers through participation in weekly information sessions for nondisabled Special Friends, and participation of students with and without disabilities in everyday leisure activities that stress socialization. Socialization and the development of positive attitudes by nondisabled children, rather than curricular skill acquisition by the children with disabilities, are emphasized (Voeltz, 1980, 1982) in Special Friends programming.

Other interventionists rely on strategies to teach individuals with disabilities to initiate interactions with nondisabled persons appropriately (Brady et al., 1985; Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984), or prompt nondisabled peers to make social initiations to their peers with significant disabilities (Odom, Hoyson, Jamieson, & Strain, 1985). In preschool and lower elementary grades, activities, and activity participation characteristics, may be modified to promote affectionately oriented responses (McEvoy, Twardosz, & Bishop, 1990; Twardosz, Nordquist, Simon, & Botkin, 1983).

Program leaders who advocate a cooperative learning approach (D. W. Johnson & Johnson, 1984; Rynders, Johnson, Johnson, & Schmidt, 1980) group several nondisabled participants with a few children who have disabilities during recreation activities. Participants are trained in how to complete a project together, support the effort of teammates with expressions of encouragement and praise, making certain that each member contributes toward achievement of a common goal, often with a group reward given for accomplishment. This strategy, formerly used primarily in academic environments (D. W. Johnson & Johnson, 1975, 1984; D. W. Johnson, Johnson, & Maruyama, 1983; R. T. Johnson & Johnson, 1981), is gaining popularity in inclusive

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community leisure/recreation environments as well (Rynders & Schleien, 1991; Rynders et al., 1993; Schleien, Fahnestock, Green, & Rynders, 1990).

Participation by children with autism in inclusive education and leisure/recreation programs is becoming more frequent (Odom & Strain, 1984). Students with autism have been integrated into recess periods (Strain, 1983), school leisure environments (Gaylord-Ross et al., 1984; Schleien, Cameron, Rynders, & Slick, 1988), physical education classes (Schleien, Rynders, Mustonen, & Fox, 1990), playground programs (Schleien, Olson, Rogers, & McLafferty, 1985), and dyadic leisure activities in the classroom and community (Blew, Schwartz, & Luce, 1985). Interestingly though, few published articles address participation of students with autism in art activities (Schleien, Ray, Soderman-Olson, & McMahon, 1987; Schleien, Rynders, & Mustonen, 1988). This is an unfortunate omission since several authors have argued that children with disabilities, including autism, should participate in structured art education activities. For example, Dalke (1984) recommended that art educators and special educators work together to develop art curricula for children with disabilities. Gair (1980) suggested that art education can assist children who have disabilities to acquire behavioral, academic, and aesthetic skills. Acquisition of art skills, according to Gair, may be measured by the achievement of art-related goals and objectives on a student's individualized education plan (IEP). Morreau and Anderson (1984) and Schleien, Rynders, et al. (1988) recognized art as a leisure skill and recommend assessing a student's preference for it in order to develop improved LEP objectives, assessing generalization of art skills from school to nonschool environments as an important long-term IEP goal. Art is also a lifelong skill with the potential for becoming one's vocation. Katz (1994) described the National Institute for Art and Disabilities, a community-based art center where adults with developmental disabilities work with practicing artists to produce works that are shown in galleries, museums, and other environments, and sold in gift shops.

Schleien et al. (1987) enlisted professionals in therapeutic recreation, special education, and art education to develop an inclusive art education program for children with moderate to severe cognitive disabilities and non-disabled same-age students. Activities revolved around visits by special education and regular education students to a children's museum where they participated in cooperatively structured art activities designed to teach basic art skills and facilitate social interactions. A significant increase in social interactions between students with and without disabilities occurred. Additionally, nondisabled children received higher scores on an acceptance scale at the end of the study.

Based on the success experienced by Schleien et al. (1987), the current study was designed to integrate students with autism into age-appropriate art activities with nondisabled peers. The purpose of the study was to evaluate the effects of inclusive art activities, activities designed to encourage cooperation and positive interactions, on the frequency of social interactions between participants with and without autism.

METHODS

Subjects and Settings

Fifteen students with autism and 53 nondisabled students, all attending an elementary school in St. Paul, Minnesota, participated in the study which took place in KIDSPACE, a children's art gallery and studio at the Minnesota Museum of Art in St. Paul. Children with autism ranged from 4 to 11 years and attended self-contained classrooms interspersed with regular education classrooms throughout one wing of a regular elementary school. Students with autism were integrated physically into school activities such as assemblies, playground recess, and cafeteria lunch; however, no structured social inclusion programs had been implemented prior to the study, and children rarely, if ever, interacted with one another when they were in the same environment. Furthermore, children with autism and their non-disabled peers had little or no direct interpersonal contact with one another. Age, sex, and a brief description of each student with autism are presented in Table 1 as are raw scores and standard scores on the Topeka Association for Retarded Citizens (TARC) Assessment Inventory for Severely Handicapped Children (Sailor & Mix, 1975), a short-form behavioral assessment standardized on children with significant cognitive impairments from 3-16 years of age. According to the authors, this instrument "provides a quick assessment which stresses observable (measurable) behavioral characteristics.

Table I. Characteristics of Participants with Autism TARC

Name	Age	Sex	Raw score ^a	Standard score ^b	Diagnosis
Older group					
Dean	10	M	155	68	Autism/Severe mental retardation
Steve	8	M	180	81	Autism
Mark	11	M	174	79	Autism/Moderate mental retardation
Kurt	7	M	157	69	Autism/Moderate mental retardation
Edward	10	M	109	44	Autism/Severe mental retardation
Andy	11	M	149	64	Autism/Severe mental retardation
Brad	7	M	146	63	Autism/Severe mental retardation
Younger group					
Bill	5	M	90	34	Autism/Severe mental retardation
Roger	6	M	66	21	Autism/Severe mental retardation
Cindy	6	F	50	11	Retts Syndrome/Severe/Profound mental retardation
Sam	6	M	132	56	Autism/Moderate mental retardation
Todd	5	M	110	44	Autism
Travis	8	M	136	59	Autism
Mary	4	F	38	4	Retts Syndrome/Profound mental retardation
Doug	8	M	92	35	Autism/Profound mental retardation

^aRaw scores as reported on the TARC Assessment are the sum of the scores obtained in the Self-help, Motor, Communication, and Social Skills sections of the TARC Assessment (out of a maximum possible of 194).

^bStandard scores as reported on the TARC assessment are adjusted to reflect a mean of 50 and a standard deviation of 20.

It provides a 'snapshot' of the current level of functioning of a child (or a group of children, using averaged scores) on representative samples of skills, including Self-help, Motor, Communication, and Social domains" (p. 2). The school district used the assessment as a means of obtaining descriptive information about the students with autism, and to measure their progress in skill areas after implementation of educational interventions. Because the TARC was standardized on children who had significant impairments, its use is limited to comparisons of children with severe disabilities to one another. There is no correlation between TARC scores and degrees of mental retardation.

Students with autism were divided into two groups on the basis of age and classroom assignment. Nondisabled participants were members of a first-grade class, and a combined classroom of children in the fourth and fifth grades. All nondisabled students were of average intelligence with the exception of a fully mainstreamed student in the fourth—fifth grade class with mild mental retardation. The combined classroom of fourth—fifth graders was assigned to participate in art activities at the museum with Group 1, primarily older children with autism. The first graders were assigned to participate with Group 2, primarily younger children with autism.

Participants traveled together by bus from their school to the Minnesota Museum of Art, a distance of approximately 5 miles. Integrated art activities were conducted in KIDSPACE/Gallery 540, a section of the museum designed especially for children ages 5 to 12. The first 10 to 15 minutes of each 2-hour visit were spent in a room of the museum (a gallery) containing an exhibit of art work that had been designed to be manipulated by children. For example, square canvas panels painted various colors and decorated with a Greek key design had been affixed to the wall with Velcro, and integrated groups of children were encouraged to rearrange the squares to create a design of their choice. A floor puzzle consisting of large foam wedges was arranged to encourage integrated groups of children to work together to move the pieces and reassemble the puzzle. Grecian style columns in one of the rooms glowed and flashed when light and heat sensors in the bases of the columns were activated by movement in the room or when flashlights were aimed at the sensors. Manipulative art activities, which took place during the remainder of the visit, were held in a large room (a studio). Here,

children worked together on projects on the floor or at small tables. Because classroom teachers and school administrators were concerned about the students' infrequent exposure to art instruction, due to not having an art teacher on staff, manipulative activities, particularly those which introduced students to basic art skills and concepts, were emphasized.

Participants with autism and nondisabled students were accompanied by classroom staff on all trips to the museum. Each group of students with autism was accompanied by a licensed special education teacher with several years of experience, a master's level speech pathologist, and several paraprofessional teaching assistants. Nondisabled peers were accompanied by their classroom teacher, a licensed elementary school teacher. Regular education teachers had minimal exposure to children with autism, although the fifth-grade teacher had a mainstreamed student with mild mental retardation in her class.

Research Design

A multiple baseline design across groups (Barlow & Hersen, 1984; Dattilo, Gast, & Schleien, 1993; Tawney & Gast, 1984) was used to evaluate the effects of activities structured to encourage cooperative ("You need to work together to paint . . .") rather than individualistic ("Improve on the project you made last week") participation, and friendship-like interaction training for nondisabled peers. The design was selected because it allowed the demonstration of the controlling effects of the intervention procedure, and ensured that both groups would be exposed to the intervention procedures, providing for the possibility of replication.

Procedures

Curriculum Development. An art education curriculum was developed by art education staff from the Minnesota Museum of Art. The investigators, who have professional certifications in therapeutic recreation (first and second authors) and special education (third author), assisted the art education staff to devise and/or modify art activities to facilitate cooperation between students with and without disabilities. Art education staff were taught to use principles of cooperative goal structuring (D. W. Johnson & Johnson, 1975, 1984; D. W. Johnson et al., 1983; R. T. Johnson & Johnson, 1981), including structuring directions to encourage activity completion on an interdependent basis by small groups of students, and inclusion of a student with disabilities into a group of several nondisabled students who had been prepared to interact cooperatively, during intervention. Prior to involvement in the study, art education staff had minimal experience and no training in the use of cooperative goal structuring or teaching art to students with autism.

Culminating Activity. The first four sessions for each small group consisted of activities designed to teach the concepts of line, shape, color, and texture. During the remaining sessions, each small group worked together to develop "kid-spaces," "moms" made with large sheets of cardboard and decorated with paint, colored paper, and so forth. Parents and friends were invited at the close of the project to see these unique kid-spaces.

Staff Training Prior to Baseline. Regular and special education teachers, educational assistants, and classroom aides attended a meeting with the investigators prior to the first trip to the museum. Staff attending the meeting were given copies of the baselining procedures (e.g., refraining from prompting any of the students to engage in cooperative behaviors or reinforcing them for doing so). Roles of school staff members were clarified and they were given an opportunity to ask the investigators questions about their roles. Adult participants were assured that they could intervene at any time, at their own discretion, if they perceived a threat to child safety.

Baseline Procedures. The two, age-differentiated, integrated, groups of students participated in separate trips to the museum. Upon arrival, students and teaching personnel were escorted to a large classroom where the KIDSPACE museum art teacher described the activities that were to follow and assigned children to subgroups on a random basis so that subgroups contained one student with autism and a group of three or four nondisabled peers. All of the children then walked to the studio where activities consisted of several hands-on small group projects involving cutting, pasting, drawing, and painting. Activities had been structured to allow cooperation if students chose to participate in that manner, and the instructor informed all participants that they could work together or independently; the choice was theirs. No attempts were made to induce interactions between

students with autism and nondisabled students during either gallery or studio activities, nor were students reinforced for interacting. Identical procedures were adhered to for all remaining baseline sessions. Baselines for both groups were held approximately 1 week apart. Lengths of baselines were limited to two sessions for the older group and four sessions for the younger group for several reasons. First, numerous school districts had scheduled visits at the museum, resulting in few openings throughout the academic year. Second, museum staff were committed to offering art classes throughout the day, beginning in early June, limiting the length of the program to 7 months, and precluding the possibility of continuing into the summer.

Intervention Procedures. Following the baseline sessions, and prior to the first intervention session, each classroom of nondisabled students participated in a 45-minute information session designed to introduce them to ways in which they could interact as friends with children who were autistic. During this session nondisabled students viewed a slide program showing children with significant disabilities and nondisabled children engaged together in various recreation activities, including art. An accompanying audiotape described what a relationship with a child who is significantly disabled can be like, and invited the children to make friends with someone who had a disability. Children were told they would be divided into small groups the next time they went to the museum, that they would stay in those groups for the remainder of the visits to the museum, and that a child with autism would be included in each group. Each nondisabled student was asked to be a Special Friend (Voeltz et al., 1983) to the child with autism in his or her group. ["Special Friends" (Voeltz et al., 1983) is a term used to describe a semistructured, dyadic relationship between a student with a severe disability and a nondisabled peer that emphasizes friendship and participation in mutually enjoyable activities. Socialization and positive attitudes, rather than skill acquisition by children with disabilities, is encouraged.] Toward the end of this orientation session, nondisabled children were taught specific ways that they could interact successfully with peers with autism during art projects (Rynders & Schleien, 1991; Voeltz et al., 1983). Nondisabled students were encouraged to stay near their companions with autism, smile, talk pleasantly, and provide encouragement. They were also taught how and when to give assistance to their peers with autism by first encouraging their participation (e.g., saying, "Want to paint together?"), then by modeling appropriate task performance (e.g., saying, "Watch me! Hold the brush like this."), and finally offering physical assistance in a gentle manner if necessary for ensuring task completion (e.g., saying, "Let's hold the brush together."). Activities in both the gallery and studio were planned by the KIDSPACE art instructor to engender cooperative interaction, but without forcing it. For example, in the gallery, children were encouraged to help each other to assume a physical position representing an art image ("How does a big, bright circle look?"). In the studio, large wedge-shaped pieces of cardboard were handed out, one to each small integrated subgroup, along with pieces of yarn, various types of seeds, jars of paint, etc. Group members selected from these objects together. Thereafter, the "pizza pieces" were created interdependently and then laid side-by-side to create a "whole pizza" following the art teacher's instruction.

Staff Training Prior to Intervention. Following the information session for students without disabilities, the second author met with the special education teachers to review intervention procedures and their responsibilities as interaction facilitators. She explained the procedures for supervising activities, which included staying with their assigned group, remaining as nondirective as possible, and removing a student from an activity only if implementation of a school-required behavior management strategy was necessary. Staff were asked to refrain from prompting interactions, but were encouraged to reinforce their positive occurrence. Each staff member received a copy of the procedures that would be in effect during intervention and were given an opportunity to ask questions.

The Intervention. The older and younger groups participated in separate monthly intervention sessions. The schedule and type of gallery and studio activities that followed were identical to the schedule and type of activities that occurred during baseline. Intervention procedures, in addition to those described above, consisted of directions from the KIDSPACE art teacher as to how to complete the art project in the gallery and studio for that day, and a single statement encouraging children to remain in groups and to work together to complete the art project. No other prompting to interact socially was provided on any given day except for one initiating prompt in the gallery and one in the studio.

Table II. Definitions of Social Interaction^a

Initiates positive social interaction: Student actively seeks positive contact with peer by touching peer, gesturing to, vocalizing to, or talking to peer. Contact must be directed toward a specific person. Accidental touches within the context of an activity are not initiations.

An initiation is any behavior that begins an interaction between two children who have not interacted for the previous 3 seconds. Initiations must be separated by at least 3 seconds to be coded as multiple initiations.

Receives positive social interaction: Student is touched, gestured to, given direction or questioned by peer. Contacts must have been specifically directed toward student. Accidental touches within the course of an activity are not coded as having received an interaction.

An interaction is coded as having been received only when the received interactions that preceded it are separated by 3 or more seconds. Social interactions that are received must be separated by 3 or more seconds to be coded as multiple interactions.

^o*Positive social interactions include giggles, laughs, smiles, questions, comments, praise, pats, and/or hugs that are directed toward a peer or received from a peer.*

Dependent Variables

Dependent variables in the study included (a) frequency of positive social interactions directed toward students with autism by their peers with autism and by nondisabled peers, (b) frequency of positive social interactions initiated by the students with autism toward their peers with autism and nondisabled peers, and (c) appropriate and inappropriate behavior of students with autism. Each variable was observed in both the gallery and the studio areas of the museum.

Social Interaction. Using predetermined definitions of social interactions, an observer monitored the behavior of a student with autism. Definitions of initiated and received social interactions are found in Table 11.

Observation Procedures. An individual with extensive previous experience in recording behaviors of children with autism (not one of the authors) was employed as the primary observer for this investigation. (The authors conducted reliability observations only.) Observations of each child with autism during group activities in both the gallery and studio areas were conducted using a modified split-interval recording system. The first 15 seconds of the interval consisted of observations of appropriate—inappropriate behavior,² followed by a 5-second recording period. During the second 15-second period, observations of social interactions occurred, followed by a 5-second recording period. Intervals totaled 40 seconds in length. Tape-recorded instructions and tones delivered via headphones plugged into a cassette tape player signaled the observer when to observe, the type of behavior to monitor (i.e., initiator or recipient of positive social interaction), and when to record her observation on a data collection form. Beginning with the first student with autism, a tape-recorded voice instructed the observer to monitor the student's positive social interactions. The student was observed for 15 seconds when a tone again sounded. The observer was allotted 5 seconds to record each positive social interaction that was initiated by the student with autism to a nondisabled peer or a peer with autism, and each initiation directed toward the student with autism by either type of peer during that interval. A tone signaled the end of the first interval. The observer had 10 seconds to locate the next student and move to a position where the child could be easily observed. Observations continued in the same manner until all students had been observed. The observer then returned to the first student and continued the cycle of observations until the session ended. Students in the older group were observed an average of 1137 intervals during each baseline and intervention phase of the study. Students in the younger group were observed an average of 11.66 intervals during these two phases.

RESULTS

Interobserver Agreement

Interobserver agreement was obtained using the formula:

$$\text{Percentage agreement} = \frac{\text{agreements}}{\text{agreements} + \text{disagreements}} \times 100$$

²These data were not analyzed due to an accelerating baseline trend, a trend that could not be accommodated experimentally because of the scheduling restrictions described earlier.

Reliability probes were conducted during one of the two baseline sessions scheduled for the older group, and during three of the six intervention sessions. For the younger group, interrater reliability probes took place during two of the four baseline sessions and three of the five intervention sessions. Interobserver agreement on the dependent variable of appropriate/inappropriate behavior ranged from 77.5 to 97.3%, averaging 88% across *baseline* and intervention conditions. Interobserver agreement on social interactions ranged from 80.5 to 100%, averaging 91.7% across baseline and intervention phases. Since there were numerous intervals during which neither observer recorded social interaction behaviors, percentage of agreement calculations included intervals of nonoccurrence.

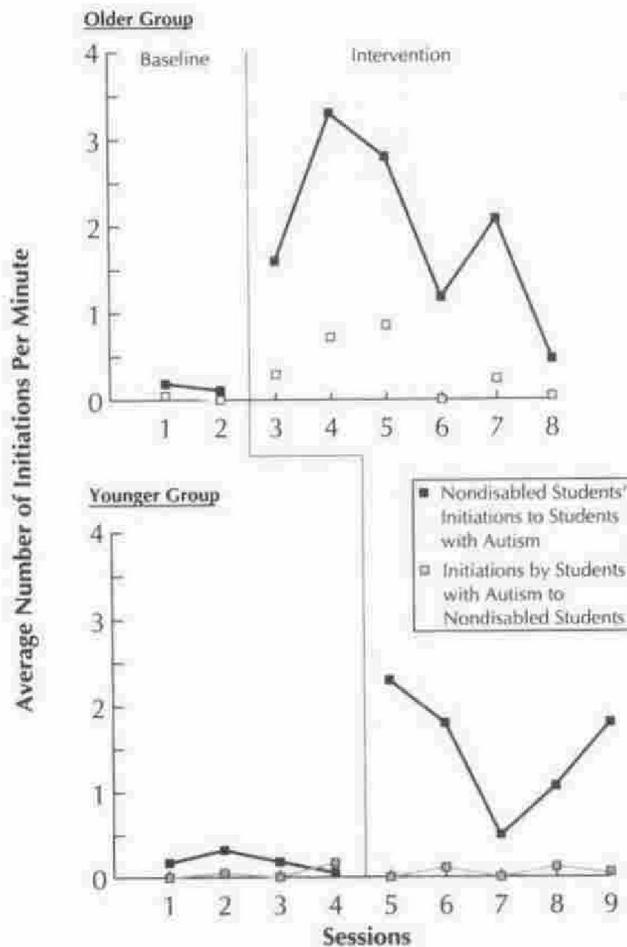


Fig. 1. Social interactions of students with autism and nondisabled peers across experimental conditions.

Data Analysis

Data collected during monthly visits to KIDSPACE/Gallery 540 were analyzed in several ways. Data on the social interactions of each student with autism were grouped with that of other students with autism. The average number of social interactions per minute directed toward students with autism by their nondisabled peers were calculated and graphed across experimental conditions (Figure 1).

Statistical analyses of the data were undertaken to determine if numerically significant changes occurred in the social interactions of students with autism with nondisabled peers across experimental phases. Data were analyzed through the use of the Statistical Package for the Social Sciences (SPSS; Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). Paired *t* tests were used to determine if significant differences existed between the social interactions of the older group and the younger group from baseline to intervention (Table III). Also, paired *t* tests based on the means of grouped participant data for social interactions directed at participants with autism by nondisabled peers and initiated by participants with autism during each session were conducted to determine if significant differences existed between experimental conditions for the older and younger groups (Table IV).

Table III.

***t* Tests Comparing Social Interactions Directed Toward and Initiated by Students with Autism During Baseline and Intervention Conditions**

Variable	Baseline		Intervention		<i>t</i> value <i>t</i> (6)	Two-tailed <i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Older group						
Interactions directed toward students with autism	0.152	0.209	1.940	1.050	4.03	.007 ^a
Interactions initiated by students with autism	0.071	0.131	0.376	0.673	1.13	.300
Younger group						
Interactions directed toward students with autism	0.214	0.297	1.466	0.847	3.56	.012 ^a
Interactions initiated by students with autism	0.047	0.071	0.061	0.098	0.55	.604

^aSignificant at *p* = .05.

Table IV.

***t* Tests Comparing Older and Younger Groups of Students with Autism on Social Interactions Directed Toward and Initiated by Students with Autism**

Variable	<i>t</i> value	Two-tailed <i>p</i>
Interactions directed toward students	0.95	.363
Interactions initiated by students	1.08	.323

Social Interactions

Older Group. Data on positive social interactions are displayed in Figure 1. Positive interactions directed toward the students with autism by nondisabled peers increased significantly at the .05 level ($t = 4.03$). However, interactions initiated by the students with autism toward their non-disabled peers remained low and stable across conditions for the younger group. The older group showed a slight increase during the first three intervention sessions, which declined to baseline levels during the final three sessions.

Younger Group. Paired t tests revealed significant increases (at the .05 level) in interactions directed toward students with autism by nondisabled peers ($t = 3.66$). Interactions initiated by students with autism to nondisabled peers did not increase or decrease significantly, as was the case in the older group.

Older Group Versus Younger Group. No significant differences between groups were revealed in paired t -tests of interactions directed toward the students *with* autism by nondisabled peers, or interactions initiated by the students with autism to nondisabled peers across conditions.

DISCUSSION

The purpose of the study was to investigate whether participation in inclusive art activities would have a positive influence on social interactions between students with autism and their nondisabled peers. Social interaction data from both groups reveal that positive interactions from nondisabled peers toward peers with autism were higher during intervention than during baseline. However, among both groups of students with autism and their peers, rates of positive interactions per minute varied greatly from session to session, perhaps due to the nature of some of the art activities developed for this program. Quilitch and Risley (1973) and Vickery, McCabe, and Field (1983) noted that giving students certain types of play materials (e.g., crayons, play dough) actually reduced their frequencies of interactions with their peers, while other materials (e.g., checkers, cards, board games) appeared to promote social interactions. It may be that some of the art activities used in this study were so interesting in and of themselves that children focused their attention on the activity rather than on their peers.

The dramatic increase in social interactions, which did not occur until the first intervention session for both groups was under way, demonstrates the effectiveness of the procedures (i.e., a preparation session that included specific training for nondisabled students in how to encourage peers with autism to participate in joint art activities and adaptation of art activities to allow and encourage cooperation) for increasing social interactions between students with and without autism. However, since social interactions for both groups of students varied through the remainder of the intervention sessions, it appears that these procedures could be strengthened. One means to improve the effectiveness of these procedures may be for program leaders (e.g., community recreation professionals, teachers, education assistants) to observe groups of nondisabled students engaged in art activities structured to encourage cooperation in order to determine how frequently group members interact with one another, and to analyze the types of interactions that transpire. Instructions aimed at increasing interaction and cooperation to normative levels (e.g., prompts for joint participation, sharing materials, helping one another) could then be developed for use during inclusive art activities. These strategies could be implemented whenever program leaders observed interactions occurring between nondisabled students and peers with disabilities becoming qualitatively different from those occurring between nondisabled individuals engaged in the same types of activities.

The results of this investigation support the use of inclusive art classes as a vehicle for promoting social interactions directed toward children with autism by their nondisabled peers. Modification of art education activities to encourage cooperation within small groups of children of varying abilities, combined with the provision of information and training for nondisabled students, were found to have a positive influence on the nondisabled children's initiated social interactions. Future studies should probe the contribution of various independent variables employed, such as the effect of modifications to art activities alone, or the effect of information and training alone, in order to gain a clearer understanding of the amount and type of intervention needed to facilitate interactions in the most effective manner. Also, it is important to learn if strategies are

available to facilitate reciprocal social interactions, where students with autism are initiating, as well as receiving, interactions with their peers.

A limitation of this investigation is that no efforts were made to assess whether or not social interactions initiated by the nondisabled peers that occurred in the museum were generalized to school or home settings. A topic for future research is to assess the children's social interactions in other generalization sites and other activities. It could also be valuable to investigate whether generalization of social interactions occurs during art activities and other activities that are not structured specifically for cooperation.

The results of this study should be encouraging to those who wish to include children with autism into art-related activities in environments with nondisabled peers. Art skills introduced during museum activities are readily implemented during school and after-school recreation programs, community education classes, and home leisure pursuits. Although this study transpired in a community museum, the procedures can be adapted easily for use in home, school, and community environments (Schleien & Ray, 1988; Schleien, Rynders, & Mustonen, 1988). Even though art classes are usually structured so that participants work independently to complete projects, this study demonstrates that art activities can be restructured to emphasize cooperative art project outcomes. Obviously, not all art projects should be organized in this manner. But if the instructor is interested in promoting cooperation, teaching fundamental art skills, and fostering the values inherent in a high-quality integrated experience, this approach appears to be extremely effective.

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