

## Acquisition and Generalization of Leisure Skills From School to the Home and Community by Learners with Severe Multihandicaps

By: [Stuart Schleien](#), Jennifer Cameron, John Rynders and Carla Slick

Schleien, S., Cameron, J., Rynders, J., & Slick, C. (1988). Acquisition and generalization of leisure skills from school to the home and community by learners with severe multihandicaps. *Therapeutic Recreation Journal*, 22(3), 53-71.

Made available courtesy of National Recreation and Park Association: <http://www.nrpa.org/>

**\*\*\* Note: this document may be reprinted and distributed for non-commercial and educational purposes only, and not for resale. No resale use may be made of material on this web site at any time. All other rights reserved.**

### **Abstract:**

This study demonstrated the acquisition and generalization of leisure skills, social interactions, and appropriate and cooperative play behaviors by two children with severe multi-handicaps. The leisure skill program occurred in an elementary school. Systematic training procedures, incorporating task analysis, error correction, and contingent reinforcement (i.e., behavior specific positive feedback), were implemented by the leisure skill instructors in school. Parents of children with severe multihandicaps received instructional training on the systematic training procedures and then provided additional instruction to their children at home. The results, gathered using a multiple-baseline design across behaviors and replicated across children, indicated that chronologically age-appropriate leisure skills (i.e., Toss Across; Flash, The Electronic Arcade Game; Simon) were learned by the children. Furthermore, additional training by parents facilitated acquisition of skills, generalization to the home, and maintenance across time.

**KEY WORDS:** Age Appropriate, Community Recreation, Generalization, Integration, Leisure Skills, Parent/Home training, Social Interaction, Severe Multihandicapped, Therapeutic Recreation

### **Article:**

Many individuals with severe multihandicaps manifest deficits in communication, cognitive, motor, and social skills. Consequently, they may require extensive, long-term opportunities to develop competencies to achieve a normalized quality of life. Leisure education offers great promise for developing competencies which can improve the quality of life for persons who have handicaps (Anderson & Allen, 1985; Bender, Brannan, & Verhoven, 1984; Mundy & Odum, 1979; Schleien & Wehman, 1986). Furthermore the domains of home, school, and community are all essential, interrelated arenas where the individual with severe multihandicaps can learn leisure skills and thereby improve his/her quality of life (Ray, Schleien, Larson, Rutten, & Slick, 1986; Verhoven, Schleien, & Bender, 1982).

While it is expected that the community recreator has the requisite knowledge and skills to plan and implement appropriate leisure skill instructional programs for the neighborhood constituency, seldom does he or she operate alone in this process. The key to developing an independent leisure lifestyle and facilitating successful integration into community leisure environments depends greatly on the amount and quality of networking that is done. Networking involves making connections with significant individuals involved in the life of an individual with a handicap. It is a process which seeks to establish an ongoing and productive relationship between special education teachers, therapeutic recreation specialists, community recreators, and careproviders who are all striving for independent living in the community on the part of an individual who has a handicap (Rainforth & York, 1987; Ray, Schleien, Larson, Rutten, & Slick, 1986).

Many innovative and effective practices to teach age-appropriate leisure skills to persons with severe handicaps have been developed by therapeutic recreation specialists and special educators. (Nietupski, Hamre-Nietupski, & Ayres, 1984; Schleien & Yermakoff, 1983). However, few studies have included individuals with severe

multihandicaps using an ecological perspective (e.g., programs involving family members and careproviders in selection of activities, incorporating programs into community activity). This is unfortunate since an ecological perspective considers skill development within the complete range of environments in which an individual functions (Certo & Schleien, 1982; Certo, Schleien, & Hunter, 1983; Ford et al., 1984; McGregor, 1982). Certo and his colleagues described an ecological inventory to enable teachers, therapists, and careproviders to develop functional, age-appropriate, leisure skills instructional content. They believed that this approach, coupled with longitudinal planning, would increase opportunities for individuals with severe handicaps to participate actively in normalized leisure activities in integrated community settings. If individuals with developmental disabilities, including children with severe multihandicaps, are to develop repertoires of age-appropriate play and social skills, and participate cooperatively in community settings alongside nonhandicapped persons, leisure skills instruction will probably need to occur in school and home environments.

With regard to social skills, of special interest is the individual who engages in socially appropriate behavior in certain activities or environments and not others. Vandercook (1987) reported that as persons with severe handicaps became more proficient during each of two leisure skills (pinball, bowling), their social repertoires also became more sophisticated. A likely hypothesis for this phenomenon is that more efficient leisure skill performance enables participants to expend greater efforts monitoring their social behavior. Hence, if tenable, it is important to document systematically not only one's performance on a targeted leisure skill, but the influence it has on the social repertoire of a person who is severely multihandicapped. If adaptive behavior (e.g., social competencies, friendship) could be improved, "incidentally", within the context of age-appropriate leisure skills, valuable intervention time could be saved and the participant could acquire social competencies within activities in which they are expected to be expressed. The benefits that could arise from participation in a mainstream program would lend further support to the movement of people with handicaps to integrated leisure services.

The purpose of this study was to teach three chronologically age-appropriate leisure skills to two students with severe multihandicaps in their special education classroom, and to provide supplemental training through the students' families in their homes. Additionally, the investigators attempted to facilitate social interactions, and appropriate and cooperative play behaviors within the context of an integrated leisure skill program. Probes in neighborhood community-recreation centers and at the participants' homes were conducted by parents to facilitate generalization and maintenance of the targeted leisure skills.

## **Methods**

### ***Setting***

The setting was a K-6 elementary school with five of the classrooms being devoted to special education. The school's special education students, ages 4 to 11 years, had disabilities ranging from mild mental retardation to severe mental retardation with multihandicaps.

Special education teachers at the school (i.e., state certified in mental retardation-severely handicapped) and the investigators developed the leisure skill instructional program. Its goals were to increase positive social interactions between students with severe multihandicaps and their peers who were not disabled, and to allow students with severe multihandicaps to acquire the skills needed to participate in age-appropriate recreational activities in their homes and community recreation centers.

### ***Subjects***

Participants were two children with severe multihandicaps and two same-age peers without handicaps.

Amy (real names not used), a 5-year-old girl whose diagnosis was congenital cytomegalic virus inclusion (CMV) disease with microcephaly, was nonambulatory with very limited use of her left side. Amy used a wheelchair and could also roll on the floor for mobility purposes. Her score of 118 on the Bayley Scale of Infant Development (a ratio I.Q. score of 32) placed her in the severe to profound range of mental retardation. She showed high rates of inappropriate crying during activity transitions, particularly when events did not go her way (e.g., termination of free play to begin instruction on activities of daily living). Crying rarely occurred

during highly motivating activities or when she received one-on-one attention by her teacher or parent. She communicated using informal methods (i.e., pointing, touching, moving hands).

Bobby, an 8-year-old boy whose diagnosis was a hypotonic form of cerebral palsy, crawled or scooted for mobility and was beginning to walk with assistance. He functioned in the severe to profound range of retardation, which was determined through criterion-referenced behavioral observations (a standardized test score was not available for him). Bobby recognized people he had met and communicated with simple gestures (i.e., pointing with finger, hand flailing). At the time this study was conducted, Amy and Bobby were not participating in any age-appropriate leisure activities.

Nonhandicapped friends were selected from a second-grade class from the same school. Permission slips to participate in the program were sent home with each student. When slips indicating consent were returned to school, two female students were chosen randomly to participate, one time each week, in the integrated program. The friends' ages were 8 years, 6 months and 7 years, 6 months.

### *Program*

Three games: Toss Across (Milton-Bradley, \$19.95); Flash, The Electronic Arcade Game (Ideal Co., \$19.97); and Simon (Ideal Co., \$24.99) were selected for leisure skill instruction. The rationale for the selection of these games included the following concerns: (a) age-appropriate—played by nonhandicapped peers of the same chronological age; (b) functional—can be played in homes, schools, parks, and other environments; (c) social—encouraged to socially interact by allowing two or more players to participate in the activity simultaneously; (d) motor—required motor skills that were written into the students' Individual Education Plans (IEP's) (e.g., use of the upper extremities for grasping and releasing, gross motor movements of throwing, tossing, and reaching); (e) reactive—responded to players' manipulations with sensory reinforcement (e.g., visual and auditory stimulation); and, (f) family "friendly"—family members expressed interest in their children participating in the selected activities.

### *Operational Definitions*

The following operational definitions were used throughout the integrated leisure skill program:

**Appropriate Behavior:** The student engages in goal-directed activity, including appropriate use of materials and/or equipment in a chronologically age-appropriate manner, and/or orienting toward activity or instructor, in position to engage in activity.

**Inappropriate Behavior:** The student engages in nongoal-directed activity, including inappropriate use of materials and/or equipment in a chronologically age-inappropriate manner, and/or not orienting toward activity or instructor, not in position to engage in activity.

**Cooperative Play Behavior:** The student engages in same activity as peer at same time and/or appropriately watches as peer engages in activity. Must respond to or simulate peer. This includes offering, receiving, or sharing activity or activity materials.

**Initiates Social Interaction:** The student actively seeks social contact with peer by touching peer, gesturing to, vocalizing to, or talking to peer in an appropriate and positive manner.

**Receives Social Interaction:** The student is touched, gestured to, given directions or questioned by peer in an appropriate and positive manner. Accidental touches within the context of an activity are not coded as receiving.

### *Baseline and Observational Procedures*

Dyads were formed between the children with severe multihandicaps and their nonhandicapped peers. At the outset of the program, a baseline was used to determine preinstruction competency levels of learners with handicaps on the following dependent variables: (1) skill acquisition on the targeted leisure activities, (2) appro-

priate social behavior, and (3) cooperative play behavior. The baseline level for each participant with a severe multihandicap was derived by the instructor (i.e., second and fourth authors) giving a verbal cue (e.g., "Amy, play Toss Across.") and recording the steps of the task that were performed correctly without assistance within 5 seconds. If the participant did not perform a step of the task analysis independently within the required 5 seconds, the instructor performed that step without providing instruction and proceeded to assess performance on the next step of the activity. Concurrently, a trained (i.e., achieved a 90% reliability criterion prior to program commencement) observer recorded appropriate social and cooperative play behavior.

During baseline, instruction was not given to the children without disabilities on how to be friends with their peers with severe multihandicaps. Appropriate and inappropriate behaviors, cooperative play, and initiated and received social interactions among the nonhandicapped peers and the children with severe multihandicaps were observed and recorded by a behavioral observer during the activities. Appropriate and inappropriate behavior and cooperative play behavior of the participants with severe multihandicaps and social interactions between all students were recorded during eight of the 14 sessions (i.e., during first three baseline sessions and one session per week, thereafter). A combination of interval and duration measures was used to assess the participants' behaviors. To collect these data, the observer (two observers during interrater reliability checks), using a cassette tape-recorder, recorded instances of these behaviors. The audio tape informed the observer(s) as to which student and the type of behavior to observe. During instructional sessions, 30-second observations (10-second recording intervals) were conducted to determine the number of seconds (stopwatch used) that each student exhibited appropriate and/or inappropriate behavior. Also at this time, the occurrence and direction (i.e., initiated or received) of social interactions between peers and the occurrence of at least 5 consecutive seconds of cooperative play behavior during one interval were recorded.

### ***Instruction***

**Friends Training.** Following the baseline phase of the program, and before training on the leisure skills, nonhandicapped peers were given instructions on how to become friends (Voeltz et al., 1983). The goals of the friends program were to develop positive, mutually rewarding personal relationships between children with severe multihandicaps and peers who were nonhandicapped and to support the development of their social competencies. Within a 1-hour information and discussion session children without disabilities were provided with curricular content which dealt with the following questions: 1) What is a disability?; 2) Do you know anyone who has a disability?; 3) How do you feel about persons with disabilities?; 4) What is the "friends" program about?; 5) How do we communicate with someone who has a disability?; 6) What is a prosthesis?; 7) How can we play together?; 8) What is a friend?; and, 9) What are things that friends can do together?

Discussion between the friends and two instructors followed each session. Also, the friends met with the special education teacher, who provided short descriptions of each student who was severely multihandicapped and answered questions about handicapping conditions. Following friends instruction, the nonhandicapped children returned to their dyads and instruction commenced on the leisure activities. During activities, dyads were socially reinforced (e.g., verbal praise, smile) on a contingent basis for interacting socially. However, social interactions between children were not prompted by the instructors.

**Leisure Skill Instruction.** Two graduate students studying to be therapeutic recreation specialists at a large midwestern university served as instructors for the leisure skill program. They received training in the use of instructional techniques and contingent reinforcement strategies, providing each dyad with instruction during a 1-hour time period, 2 days per week. The friends participated in leisure skill instruction alongside their peers with severe multihandicaps during only one of these sessions each week since the regular education teacher allowed her students to participate as friends only one time per week. Observers collected data for 15 minutes of each session, always allowing for a 5-minute warm-up where data were not collected.

Each leisure skill was task analyzed (See Table 1) and instruction was provided using an assistance hierarchy or error correction procedure (Day, 1987), as follows: The task was presented with the initial cue (i.e., "Let's play Toss Across."). A correct response was rewarded with behavior specific positive feedback (BSPF). An error re-

sponse, or no response within 5 seconds, was followed by a verbal cue from the instructor (e.g., "Amy, pick up the bean bag."). If a correct response occurred it was rewarded with BSPF. An error response, or no response within 5 seconds, was followed by the instructor repeating the verbal cue and modeling the correct response (i.e., picking up the bean bag). If the modeling did not evoke the correct response, the instructor repeated the verbal cue while physically guiding the learner through the activity and providing BSPF.

**Table 1.**

**Task Analyses for Three Leisure Skills**

- 
- I. Toss Across
1. Attend to game.
  2. Pick up first bean bag with preferred hand.
  3. Stand at appropriate distance from game.
  4. Face target.
  5. Move arm backward to underhand throwing position.
  6. Toss first bean bag at target.
  7. Wait for next turn while attending to partner's first toss.
  8. Pick up second bean bag with preferred hand.
  9. Stand at appropriate distance from target.
  10. Face target.
  11. Toss second bean bag at target.
  12. Wait for next turn while attending to partner's second toss.
  13. Pick up third bean bag with preferred hand.
  14. Stand at appropriate distance from target.
  15. Face target.
  16. Move arm backward to underhand throwing position.
  17. Toss third bean bag at target.
  18. Attend to partner as s/he takes third turn.
  19. Count number of squares flipped-over.
  20. Retrieve all bean bags from floor.
- II. Flash, The Electronic Arcade Game
1. Attend to game.
  2. Turn on/off switch to "on" position.
  3. Press start panel.
  4. Pick up first bean bag with preferred hand.
  5. Stand at appropriate distance from target.
  6. Face target.
  7. Move arm backward to an underhand throwing position.
  8. Toss first bean bag at target.
  9. Check target for "hit" by listening for "hit" signal.
  10. Wait turn while attending to partner's first toss.
  11. Pick up second bean bag with preferred hand.
  12. Stand at appropriate distance from target.
  13. Face target.
  14. Move arm backward to underhand throwing position.
  15. Toss second bean bag at target.
  16. Check target for "hit" by listening for "hit" signal.
  17. Wait turn while attending to partner's second toss.
  18. Pick up third bean bag with preferred hand.
  19. Stand at appropriate distance from target.
  20. Face target.
  21. Move arm backward to underhand throwing position.
  22. Toss third bean bag at target.
- II. Flash, The Electronic Arcade Game
23. Check target for "hit" by listening for "hit" signal.
  24. Wait turn while attending to partner's third toss.
  25. Listen for "end of game" signal.
  26. Turn the on/off switch to "off" position.
  27. Retrieve bean bags from floor.
- III. Simon
1. Slide the on/off switch to "on" position.
  2. Slide the game selector switch to "1" position.
  3. Slide the skill level switch to "1" position.
  4. Press start button.
  5. Look at "lighted" panel and/or listen to its sound.
  6. Press "lighted" panel within 5 seconds. If matching error occurs, wait for next turn while attending to partner. If correct panel is selected, wait turn while attending to partner.
  7. Slide the on/off switch to "off" position.
-

**Home Training.** The children with severe multihandicaps received additional training on the leisure skills by their parents, at home, once each week to facilitate generalization to the natural environment and skill maintenance. Initially, parents were familiarized with the three games (i.e., Toss Across; Flash, The Electronic Arcade Game; and Simon). During the first home session, the instructors demonstrated the use of the task analysis, and the error correction procedure, and also trained them in the use of BSPF. However, since the first session at home served as a generalization "probe", a non-reinforced baseline session was conducted (i.e., leisure skill instruction was not provided to the children). For the remaining five home sessions, parents provided instruction to their children with the instructors present, but not interactive.

Siblings were encouraged to participate in the activities. However, they did not receive the training that was given to their parents because spontaneous interaction rather than tutorial-type relationships between siblings was desired. Since interactions between siblings were not controlled, both friendly and tutorial-type interactions were exhibited during home sessions.

**Generalization.** One generalization probe on all three leisure activities was conducted at a neighborhood community recreation center for each participant with severe multihandicaps. To accomplish this, the instructors met the parents and participants at the recreation center. One friend attended one session and participated in all activities, but the other friend was unable to attend her generalization session due to illness. At these sessions, a parent was instructed to give a general verbal cue to the participants and a maintenance probe was conducted. The participants' behaviors were observed and recorded by the instructors. Interrater reliability on the task analyses for the three games, across both learners with severe handicaps, was 100% during generalization probes.

### ***Research Design***

The research was conducted using a multiple-baseline design across similar activities (Herren & Barlow, 1976; Tawney & Gast, 1984). Three similar, yet independent, activities (i.e., Toss Across; Flash, The Electronic Arcade Game; and Simon) were taught to the two children with severe multihandicaps. Proficiency on each targeted activity was observed and recorded concurrently and continuously under the same environmental conditions for a predetermined number of baseline sessions. Leisure skill instruction commenced on the first activity (Toss Across) while baseline was continued for the other two activities. Following three instructional sessions on Toss Across, instruction commenced on the second activity, Flash, The Electronic Arcade Game. Following two instructional sessions on Flash, The Electronic Arcade Game, instruction commenced on Simon. Although the number of baseline sessions for each skill were predetermined, if a significant upward trend reflecting skill acquisition had occurred during any of the three pre-instructional baselines, the baseline would have been extended. In this manner, baseline rates would be descending or stable before the introduction of leisure skill instruction. Also, a quasi-experimental (A-B), single subject research methodology was used to examine the effects of the leisure skill program on the play behavior of children with severe multihandicaps, and their social interactions with their nonhandicapped friends.

## **Results**

### ***Reliability***

Interrater reliability was established by having two observers simultaneously observe and record the targeted behaviors of the students during five of the eight integrated sessions. A double-jack earphone connected to the battery operated cassette tape-recorder informed the observers when to begin observing (i.e., 30-second interval) and recording (i.e., 10-second interval) each student's performance. Interrater reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements. Average reliability across both students and across appropriate play, cooperative play, and social interactions and baseline and intervention conditions was 88%, with a range from 73% to 99%. Interrater reliability on the task analyses for the three games, across both learners and all conditions, averaged 95%, with a range from 85% to 100%.

**Leisure Skill Acquisition.** Figures 1 and 2 illustrate students' performances across the three leisure skills throughout the baseline and instructional phases of the program.

## BOBBY

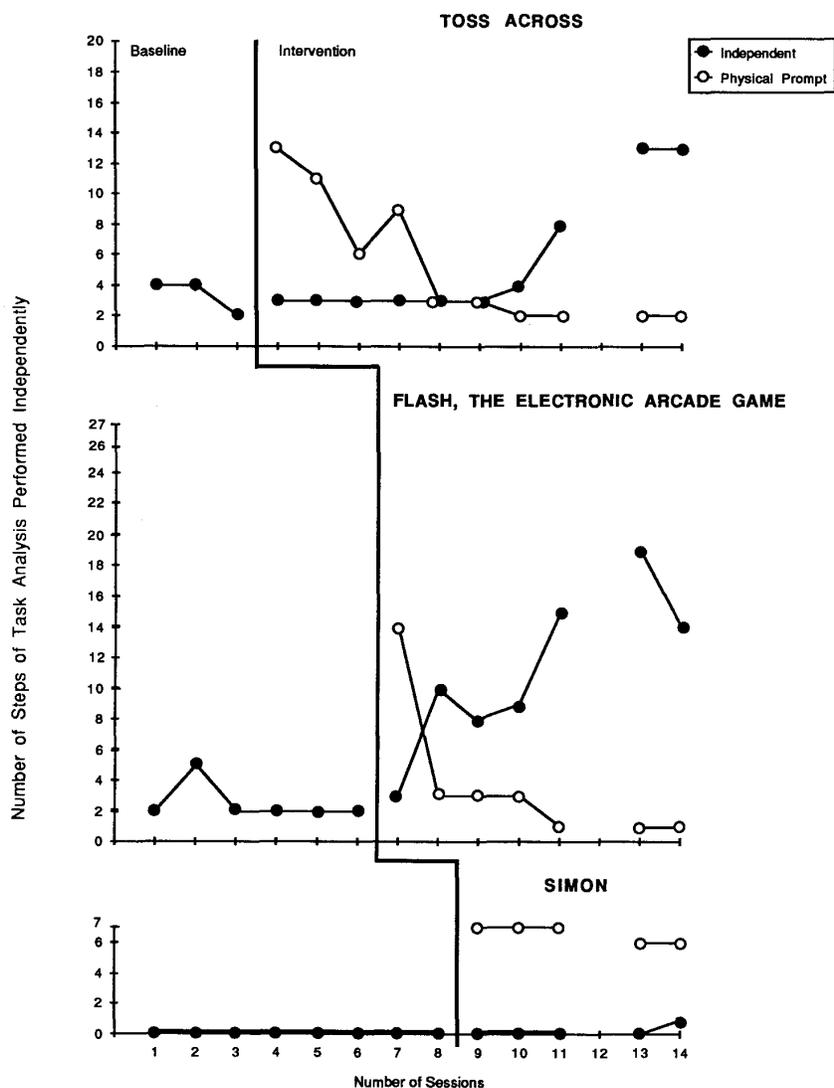


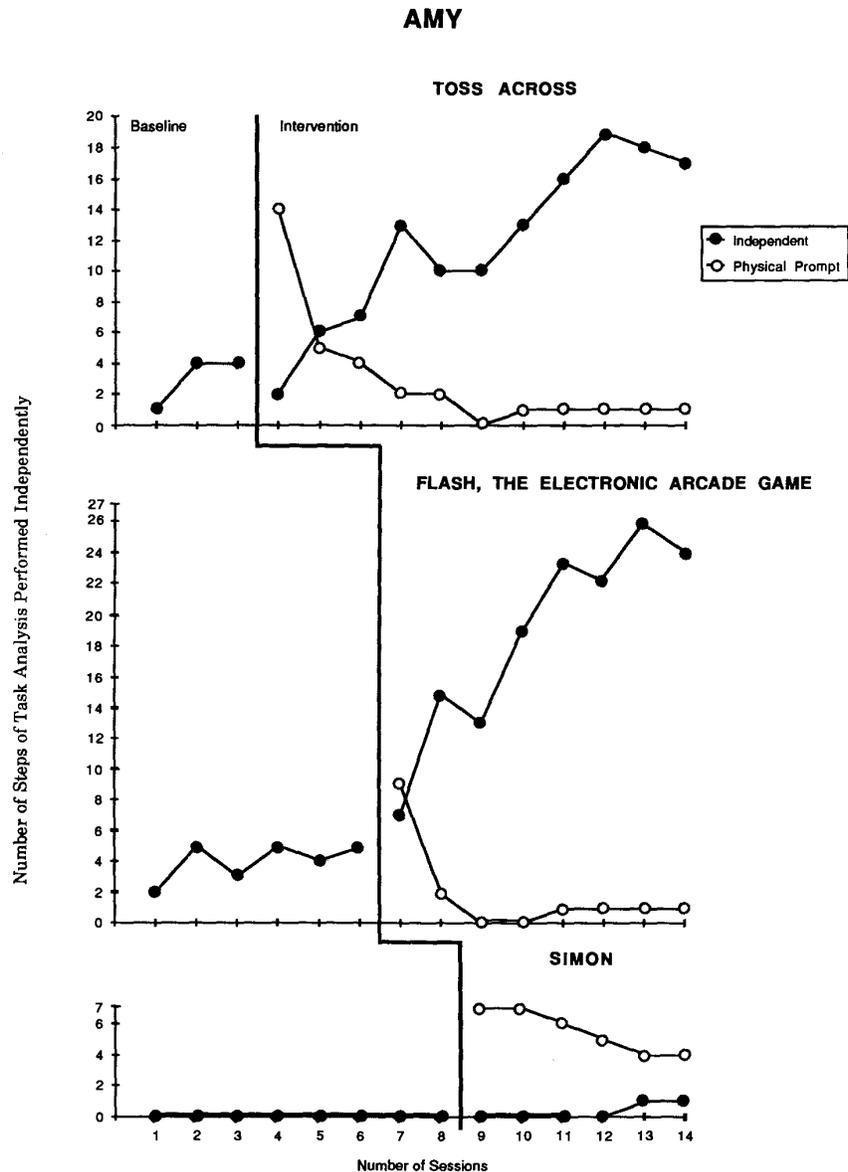
FIGURE 1. NUMBER OF STEPS OF TASK ANALYSES PERFORMED INDEPENDENTLY OR WITH PROMPT BY BOBBY ACROSS THREE LEISURE SKILLS.

Individual graphs reveal low and stable baseline performances on each leisure skill with the exception of Amy's performance on Flash, The Electronic Arcade Game, which shows a slight increase in performance. In the baseline session immediately preceding the intervention phase of the program, Bobby demonstrated independent performance in 2 (10%) of the task analytic steps of Toss Across, 2 (7%) of the steps of Flash, The Electronic Arcade Game, and 0 (0%) of the steps of Simon. His overall mean baseline performance on the three leisure skills were 17%, 9%, and 0%, respectively. Amy performed independently in 4 (20%) of the task analytic steps of Toss Across, 5 (18.5%) of the steps of Flash, The Electronic Arcade Game, and 0 (0%) of the steps of Simon during the final baseline session. Her overall mean baseline performance on the same three leisure skills were 15%, 14%, and 0%, respectively.

As can be seen (Table 2), during nonreinforced baseline probes generalization from one leisure setting to another is apparent but minimal (i.e., school, to home, to recreation center). The ability to transfer training to other environments only slightly was especially noticeable when the leisure skills were introduced into the community center.

Bobby returned to baseline levels of performance following the introduction of a leisure skill to a new environment except for Flash, The Electronic Arcade Game, where he improved slightly. Amy's rate of

independent leisure skill performance also decreased in the new environments, with the exception of Flash, The Electronic Arcade Game, but not to baseline levels of performance. Both learners demonstrated increases in their levels of independent performance following instruction on the activities in the new leisure environments. Both Bobby and Amy displayed minimal improvement in the third leisure skill, Simon, due possibly to the fact that the students received only five to six instructional sessions on how to play Simon in school because of the extended baseline and the termination of the school year. Moreover, it is possible that Simon was a more complex task relative to the other activities, necessitating more sophisticated motor and cognitive skills.



**FIGURE 2. NUMBER OF STEPS OF TASK ANALYSES PERFORMED INDEPENDENTLY OR WITH PROMPT BY AMY ACROSS THREE LEISURE SKILLS.**

**Appropriate and Cooperative Play Behavior.** In the baseline session immediately preceding the intervention phase of the program, Bobby played in a socially appropriate manner 50% of the time. He did not exhibit any cooperative play behavior during the last baseline session. During intervention, Bobby exhibited appropriate play behavior during an average of 62% of the intervals, with a range of 50% to 75%. He played cooperatively for at least 5 consecutive seconds during any one interval, on the average of 87% of the intervals, with a range of 70% to 100%.

Amy exhibited appropriate play behavior 62% of the time in the baseline session immediately preceding the intervention phase of the program. She also did not exhibit any cooperative play behavior during the last baseline session. During intervention Amy exhibited appropriate play behavior on the average of 90% of the

intervals, with a range of 83% to 94%. She played cooperatively for at least 5 consecutive seconds during any one interval on the average of 94% of the intervals with a range of 85% to 100%.

**Social Interactions.** Prior to the implementation of the friends training program, Bobby received at least one social initiation from his nonhandicapped friend, on the average, during 20% of the recording intervals. He did not respond to any of his friend's initiations. Following the friends training program, Bobby's friend initiated at least one social interaction on the average of 67% of the intervals observed, with a range of 40% to 90%, on a daily basis. During intervention, Bobby responded to his friend's initiations on the average of 26% of the intervals, with a range of 0% to 60%.

**Table 2.**  
**Number of Task Analytic Steps Performed Independently by Two Participants with Severe Multihandicaps Across Three Leisure Activities**

	Toss Across			Flash, The Electronic Arcade Game			Simon		
	Rec			Rec			Rec		
	School	Home	Center	School	Home	Center	School	Home	Center
<b>Bobby</b>									
Sessions: 1	*4			*2			*0		
2	*4			*5			*0		
3	*2			*2			*0		
4	3			*2			*0		
5	3			*2			*0		
6	3			*2			*0		
7	3	*2		3	*4		*0	*0	
8	3			10			*0		
9	3	3		8	*5		0	*0	
10	5			9			0		
11	8	7		15	5		0	*0	
12	NA	7		NA	12		NA	0	
13	13	11		19	16		0	0	
14	13	10	*3	14	15	*6	1	NA	*0
<b>Amy</b>									
Sessions: 1	*1			*2			*0		
2	*4			*5			*0		
3	*4			*3			*0		
4	2			*5			*0		
5	6			*4			*0		
6	7			*5			*0		
7	13	*10		7	*9		*0	*0	
8	10			15			*0		
9	10	12		13	*10		0	*0	
10	13			19			0		
11	16	13		23	17		0	*0	
12	19	14		22	20		0		
13	18	18		26	20		1	0	
14	17	15	*9	24	25	*14	1	0	*0

\* Nonreinforced baseline probe.

During baseline probes conducted prior to the implementation of the friends training program Amy received at least one social interaction from her friend, on the average, during 30% of the intervals. She responded to her friend's initiations 67% of the time. Following friend's training, Amy's friend initiated social interactions toward her during an average of 80% of the intervals with a daily range of 55% to 100%. Amy responded to the initiated social interactions on the average of 76% of the time with a daily range of 50% to 100%.

### APPROPRIATE PLAY

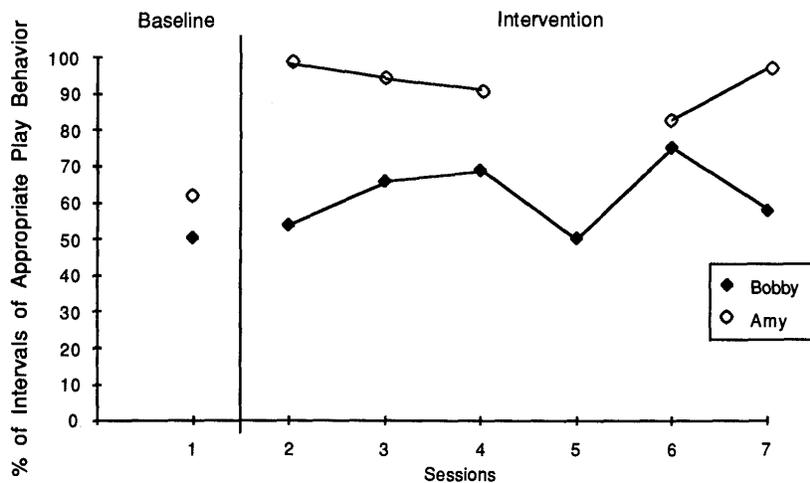


FIGURE 3. PERCENTAGE OF APPROPRIATE PLAY BEHAVIOR EXHIBITED BY BOBBY AND AMY ACROSS SESSIONS.

### COOPERATIVE PLAY

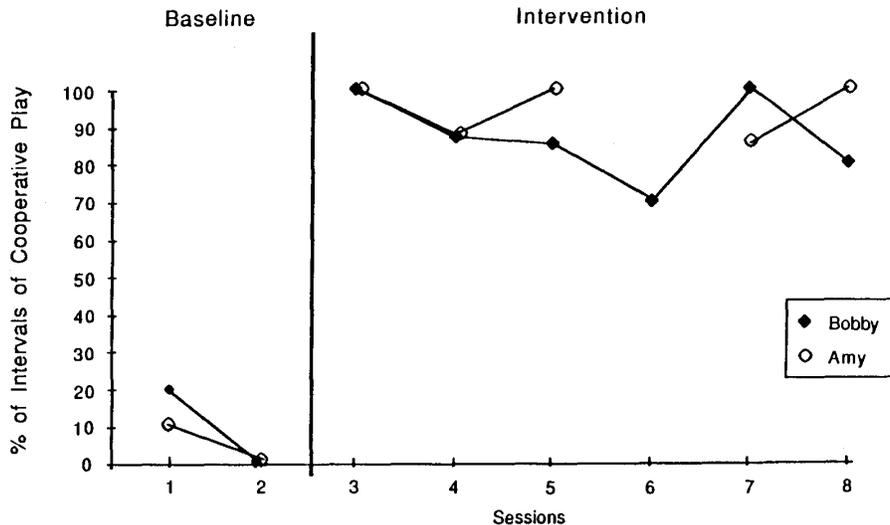


FIGURE 4. PERCENTAGE OF COOPERATIVE PLAY BEHAVIOR EXHIBITED BY BOBBY AND AMY ACROSS SESSIONS.

## Discussion

Both children with severe multihandicaps gained enough skill to participate "independently" in two of the three targeted leisure skills. The use of task analysis and other behavioral procedures, including behavior-specific positive feedback (BSPF), contingent reinforcement for positive social interactions, and parent/home training within an integrated leisure setting were effective in developing their play repertoires and, to some extent, their social skills.

As mentioned previously, due to the extended baseline and limited number of instructional sessions, both students did not acquire more than one step of the task analysis of the third game, Simon. The lack of skill acquisition suggests that game selection, based on learner preference, is a vital part of the leisure skill instructional process. Several authors advocate for and provide strategies to select activities for instruction, including consideration of learner preference (Dattilo, 1986; Dattilo & Rusch, 1985; Favell & Cannon, 1977; Voeltz & Wuerch, 1981; Wehman & Schleien, 1980; Wehman & Schleien, 1981). Simon was probably not a preferred leisure activity since both learners continued to select a game other than Simon at home during free-

choice periods following leisure skill instruction by a parent. It is also possible this lack of skill acquisition was due to the more difficult nature of the Simon game as compared to the other two activities and/or because the training procedures were not powerful enough.

**Table 3.**  
**Percentage of Intervals that Child with Severe Multihandicaps Received Social Interaction and Responded**

	<b>Friend To Child With Handicap</b>	<b>Child With Handicap Responds To Initiation</b>
<b>Bobby</b>		
Session: 1	*20%	*0
2	*20%	*0
3	50%	20%
4	85%	33%
5	56%	0
6	40%	0
7	83%	60%
8	90%	47%
	<b>Friend To Child With Handicap</b>	<b>Child With Handicap Responds To Initiation</b>
<b>Amy</b>		
Session: 1	*30%	*67%
2	*30%	*67%
3	60%	83%
4	55%	80%
5	87%	50%
6	NA	NA
7	100%	71%
8	100%	100%

\* Baseline probes conducted prior to implementation of friends program and contingent reinforcement for social interactions.

The students' with severe multihandicaps minimal abilities to generalize the newly acquired leisure skills to the home and community recreation center support the findings of existing generalization research that has identified lack of transfer of training to non-trained environments as a problem (Horner, Albin, & Ralph, 1986; Homer, Williams, & Knobbe, 1985; Stokes & Baer, 1977). Only after systematic instruction was provided by parents in the home setting (which Stokes and Baer refer to as "Train Sufficient Exemplars") did the learners with severe multihandicaps in the present study perform at acceptable rates (i.e., 75% proficiency) in the leisure activities. In fact, following every training session at home on Toss Across and Flash, The Electronic Arcade Game, Bobby and Amy improved their leisure skill performance in school. These data support Horner, Williams, & Knobbe's (1985) findings concerning the "opportunity to perform," implying that newly acquired skills will be maintained in natural performance settings only if there are additional opportunities to perform the skills following acquisition. Thus, the willingness of parents and other careproviders to follow through on school training programs appears to be critical. In fact, Marchant and Wehman (1979) found that demonstration and behavior rehearsal provided by a careprovider of a child who was severely retarded was instrumental in facilitating generalization of table game skills from the classroom to the home. The careprovider-leisure skill instructor partnership is vital to the maintenance of leisure activity repertoires in persons with severe multihandicaps.

Continuing the focus on generalization, only one non-reinforced generalization probe was conducted in the student's respective neighborhood recreation center. It is possible that if additional training in the community had been provided, the children would have performed more competently in school and at home, in addition to the community-based environment. Perhaps participants could have acquired age-appropriate leisure skills more rapidly if instruction had been provided concurrently in the school, home, and community recreation center, environments in which the student could participate naturally (McGregor, 1982; Schleien & Ray, 1988; Williams et al., 1986).

Eleven months following the study's completion, maintenance probes were conducted by the two leisure skill

instructors and parents to determine whether participants were continuing to play with the targeted leisure skills. During these home probes, Bobby and his siblings played regularly and appropriately with Toss Across and Flash, the Electronic Arcade Game. He also developed an interest in Simon and played it occasionally with his parents. Amy continued to receive verbal encouragement from her parents while playing with Toss Across and Flash, the Electronic Arcade Game. Her parents stated that these games were played more often in the warmer weather when they could be played outdoors (Amy acquired the skill indoors). Amy did not exhibit any interest in Simon.

Our findings involving social interaction, cooperative play, and appropriate play support the integration of children with severe multihandicaps and nonhandicapped same-age peers. Both participants in the present study demonstrated improvements in these behaviors from baseline to intervention. Indeed, we found a fairly steady increase in the receiving of social interactions by the participants with severe multi-handicaps from their friends and their subsequent responding to these initiations. These increases in social contacts may have been due to several factors including: increased level of mastery of the targeted leisure skills, BSPF provided for their socializing appropriately, friends training, increases in cooperative play exhibited by the children with severe multihandicaps, and familiarity between participants.

Finally, during "down time" in the classroom following integrated leisure skill instructional sessions, the nonhandicapped friends, when given the choice to return to their classroom or remain where they were, consistently remained to continue to play with their new friends. Moreover, both friends had asked the special education teacher for Bobby's and Amy's home addresses and expressed interest in maintaining their friendships. Opportunities to continue to play together and develop their friendships are made possible by the childrens' proximal living, schooling, and playing arrangements.

## References

- Anderson, S. & Allen, L. (1985). Effects of a leisure education program on activity involvement and social interaction of mentally retarded persons. *Adapted Physical Activity Quarterly*, 2, 107-116.
- Bender, M., Brannan, S., & Verhoven, P. (1984). *Leisure education for the handicapped: Curriculum goals, activities, and resources*. San Diego: College-Hill.
- Certo, N. & Schleien, S. (1982). Individualized leisure instruction. In P. Verhoven, S. Schleien, & M. Bender (Eds.), *Leisure education and the handicapped individual: An ecological perspective* (pp. 121-153). Washington, D.C.: Institute for Career and Leisure Development.
- Certo, N., Schleien, S., & Hunter, D. (1983). An ecological assessment inventory to facilitate community recreation participation by severely disabled individuals. *Therapeutic Recreation Journal*, 17(3), 29-38.
- Dattilo, J. (1986). Computerized assessment of preference for severely handicapped individuals. *Journal of Applied Behavior Analysis*, 19, 445-448.
- Dattilo, J. & Rusch, F. (1985). Effects of choice on leisure participation for persons with severe handicaps. *Journal of the Association for Persons with Severe Handicaps*, 10, 194-199.
- Day, H. (1987). Comparison of two prompting procedures to facilitate skill acquisition among severely mentally retarded adolescents. *American Journal of Mental Deficiency*, 91, 366-372.
- Favell, J. & Cannon, P. R. (1977). Evaluation of entertainment materials for severely retarded persons. *American Journal of Mental Deficiency*, 81, 357-361.
- Ford, A., Brown, L., Pumpian, I., Baumgart, D., Nisbet, J., Schroeder, J., & Loomis, R. (1984). Strategies for developing individualized recreation and leisure programs for severely handicapped students. In N. Certo, N. Haring, & R. York (Eds.), *Public school integration of severely handicapped students: Rational issues and progressive alternatives* (pp. 245-275). Baltimore: Paul H. Brookes.
- Hersen, M. & Barlow, D. (1976). *Single case experimental designs: Strategies for studying behavior change*. New York: Pergamon.
- Homer, R., Albin, R., & Ralph, G. (1986). Generalization with precision: The role of negative teaching examples in the instruction of generalized grocery item selection. *Journal of the Association for Persons with Severe Handicaps*, 11, 300-308.
- Homer, R., Williams, J., & Knobbe, C. (1985). The effect of "opportunity to perform" on the maintenance of

- skills learned by high school students with severe handicaps. *Journal of the Association for Persons with Severe Handicaps*, 10, 172-175.
- Marchant, J. & Wehman, P. (1979). Teaching table games to severely retarded children. *Mental Retardation*, 17, 150-152.
- McGregor, G. (1982). Leisure and the domains of home, school and community. In P. Verhoven, S. Schleien, & M. Bender (Eds.), *Leisure education and the handicapped individual: An ecological perspective* (pp. 21-42). Washington, D.C.: Institute for Career and Leisure Development.
- Mundy, J. & Odum, L. (1979). *Leisure education: Theory and practice*. New York: John Wiley.
- Nietupski, J., Hamre-Nietupski, S., & Ayres, B. (1984). Review of task analytic leisure skill training efforts: Practitioner implications and future research needs. *Journal of the Association for Persons with Severe Handicaps*, 9, 88-97.
- Putnam, J., Werder, J., & Schleien, S. (1985). Leisure and recreation services for handicapped persons. In K. C. Lakin & R. H. Bruininks (Eds.), *Strategies for achieving community integration of developmentally disabled citizens* (pp. 253-274). Baltimore: Paul H. Brookes.
- Rainforth, B. & York, J. (1987). Integrating related services in community instruction. *Journal of the Association for Persons with Severe Handicaps*, 12, 190-198.
- Ray, M., Schleien, S., Larson, A., Rutten, T., & Slick, C. (1986). Integrating persons with disabilities into community leisure environments. *Journal of Expanding Horizons in Therapeutic Recreation*, 1(1), 49-55.
- Schleien, S. & Ray, M. (1988). *Community recreation and persons with disabilities: Strategies for integration*. Baltimore: Paul H. Brookes.
- Schleien, S. & Wehman, P. (1986). Severely handicapped children: Social skills development through leisure skills programming. In G. Cartledge & J. Milburn (Eds.), *Teaching social skills to children: Innovative approaches* (2nd ed.) (pp. 219-245). Elmsford, NY: Pergamon.
- Schleien, S. & Werder, J. (1985). Perceived responsibilities of special recreation services in Minnesota. *Therapeutic Recreation Journal*, 19(3), 51-62.
- Schleien, S. & Yertnakoff, N. (1983). Data-based research in therapeutic recreation: State of the art. *Therapeutic Recreation Journal*, 17(4), 17-26.
- Stokes, T. & Baer, D. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, 10, 349-367.
- Tawney, J. & Gast, D. (1984). *Single subject research in special education*. Columbus, Ohio: Charles E. Merrill.
- Vandercook, T. (1987). *Generalized performance of community leisure skills with peers*. Unpublished doctoral dissertation, University of Minnesota, Minneapolis.
- Verhoven, P., Schleien, S., & Bender, M. (1982). *Leisure education and the handicapped individual: An ecological perspective*. Washington, D.C.: Institute for Career and Leisure Development.
- Voeltz, L., Hemphill, N., Brown, S., Kishi, G., Klein, R., Fruehling, R., Levy, G., Collie, J., & Kube, C. (1983). *The special friends program: A trainer's manual for integrated school settings*. Honolulu: Department of Special Education, University of Hawaii.
- Voeltz, L. & Wuerch, B. (1981). Monitoring multiple behavioral effects of leisure activities training upon severely handicapped adolescents. In L. M. Voeltz, J. A. Appfel, & B. B. Wuerch (Eds.), *Leisure activities training for severely handicapped students: Instructional and educational strategies*. Honolulu: University of Hawaii, Department of Special Education.
- Wehman, P. & Schleien, S. (1980). Assessment and selection of leisure skills for severely handicapped individuals. *Education and Training of the Mentally Retarded*, 15(1), 50-57.
- Wehman, P. & Schleien, S. (1981). *Leisure programs for handicapped persons: Adaptations, techniques, and curriculum*. Austin, TX: PRO-ED.
- Williams, W., Fox, W., Christie, L., Thousand, J., Conn-Powers, M., Carmichael, L., Vogelsberg, R., & Hull, M. (1986). Community integration in Vermont. *Journal of the Association for Persons with Severe Handicaps*, 11(4), 294-299.
- Wuerch, B. & Voeltz, L. (1982). *Longitudinal leisure skills for severely handicapped learners*. Baltimore: Paul H. Brookes.