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ABSTRACT
                As an increasing number of Head Start classrooms are
including computers as part of their classroom equipment, it is important to
identify the impact of using computers on children's behavior. Noting that
previous studies have reported conflicting findings with regard to children's
cooperative behavior, this study explored the impact of an intervention
designed to increase children's cooperation and social problem solving when
working on computers in a Head Start classroom. Seventeen children were
encouraged by an adult facilitator to help each other and to share the mouse
across three classroom sessions. Sessions were videotaped, videotapes were
transcribed, and teacher and child behaviors were coded. Findings indicated
that the frequency of child requests for help was high and decreased across
sessions, while self-initiated helping increased. Refusals of help also
decreased over time. Sharing behaviors, however, remained similar over time.
On average, 60 percent of the time children either requested a turn or
negotiated over turntaking, 26 percent of the time involved sharing, and 14
percent involved refusals to share. The facilitator used more utterances in
regard to sharing (82 percent) than helping (18 percent). The facilitator
intervention decreased over time, though more for helping than for sharing.
(KB)

Using Computers to Facilitate Social Problem Solving in Head Start Classrooms

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Abstract

Increasingly, more attention is being paid to the social aspects of computer use. The present study explored the results of an intervention designed to increase children's cooperation and social problem solving when working on computers in a Head Start classroom. Seventeen children were encouraged to help each other and share the mouse across three classroom sessions by an adult facilitator. The frequency of helping behaviors was high and decreased across sessions, while self-initiated helping increased. Sharing behaviors, however, remained similar over time. Facilitator intervention decreased over time, though more for helping than for sharing. Children collaborated when working on computers. Classroom implications are discussed.

Introduction

An increasing number of Head Start classrooms are including computers as part of their classroom equipment. Commonly, it is thought that computers may enhance cognitive skills, increase self-esteem, and serve as a motivator for learning (Shade & Watson, 1990). A more recent emphasis, however, has been on the social aspects of computer use (NAEYC, 1996). While some studies indicate that children work cooperatively at the computer (Muller & Perlmutter, 1986; Shade, Nida, Lipinski, & Watson, 1986), others show lower levels of cooperative play than other centers, and aggression in obtaining access to the computer (Anderson, 1998). These conflicting findings indicate that children may need to be taught to cooperate when using computers, similar to other areas of the classroom.

This exploratory study examines the effects of an intervention designed to encourage children to use the computer cooperatively in a Head Start classroom. We focused primarily on two situations involving the computer: sharing the mouse and helping a friend. These situations require somewhat different skills. For example, 'sharing the mouse' involves negotiating with another child over turntaking. 'Helping a friend' encourages a child to assume a collaborative role with a peer. While both situations involve conflict management skills, we predicted that sharing the mouse would involve a higher level of conflict than helping (Lauren, Hartup, & Koplas, 1996).

Our study examined changes in adult intervention and children's ability to cooperate across three classroom sessions. Over time, we expected less facilitator intervention and more cooperation among children (Benyamini, Pak, & Castelan, 1997).

Methods

Subjects

Seventeen children from a classroom at a Head Start facility were included in the study. There were 7 girls and 10 boys, with an age range of 43-60 months ($\underline{M}$ = 52.41 , $\underline{SD}$ = 6.04) . Three children declined to participate, so the final sample size was 14 (5 girls and 9 boys).

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Procedure

An adult facilitator familiarized children with the program 'Millie's Math House' in small groups. Next, three pictures illustrating the computer rules were posted next to the computer: 'find a friend', 'share the mouse', and 'help a friend'. Children worked with at least one other child during three one-hour 'center' sessions. An adult facilitator sat behind the children at the computer, encouraging them to follow the picture rules and 'use their words'. We videotaped the sessions, transcribed the videotapes, and trained two coders to 85% reliability. At least two people coded 70% of the tapes, and all disagreements were discussed.

We coded all teacher statements that encouraged helping and sharing behavior, including instructions 'we are taking turns' 'why don't you help him by pointing where he needs to click', explanations 'we are sharing so everyone can have a turn', and evaluative feedback 'I really like how you helped each other' (Tharp & Gallimore, 1991). For the children, we tallied requests for help and turntaking, helping and sharing behavior, and refusals to accept help or share. We also examined whether helping and sharing were spontaneous or elicited by a peer, a teacher, or a peer with teacher support (Muller & Perlmutter, 1985).

Results

Children's helping behaviors changed across the three sessions $\chi^2 (4, N = 287) = 33.488$, $p < .0001$. Over time, the frequency of requests for help increased at session 2 and then decreased at session 3 as children learned the program. The frequency of helping was high and gradually decreased over time. In addition, refusals of help decreased over time (see figure 1). The percentage of helping that was self-initiated versus elicited was also significantly different across the three sessions $\chi^2 (4, N = 164) = 18.913$, $p < .001$. Self-initiated helping increased, help provided when asked for by a peer decreased, and help elicited by a teacher increased from session 1 to session 2, and then decreased during session 3 (see figure 2). Children were more skilled by the last session, and were more likely to either not need help or work collaboratively, rather than answering questions or responding to a teacher. Peers considered this collaboration appropriate as shown by the decrease in refusals of help.
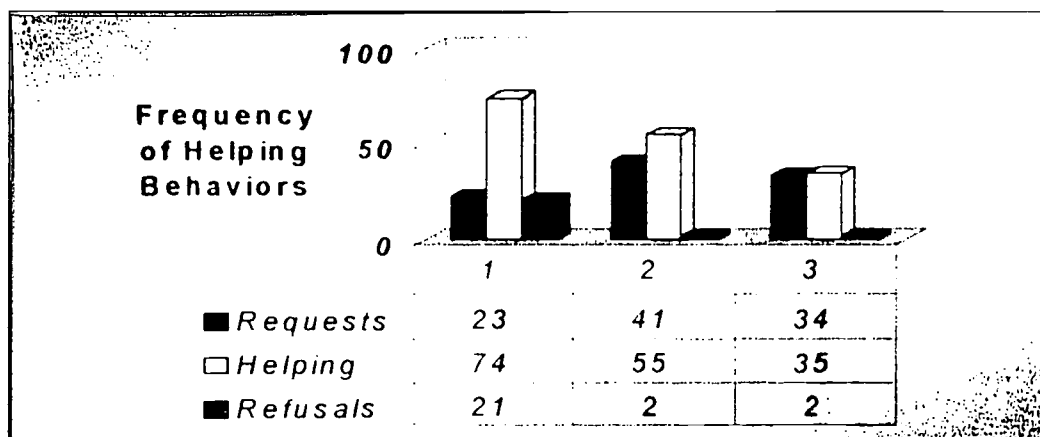

	1	2	3
■ Requests	23	41	34
□ Helping	74	55	35
■ Refusals	21	2	2

Figure 1: Frequency of Requests, Helping, and Refusals of Help Across Sessions.

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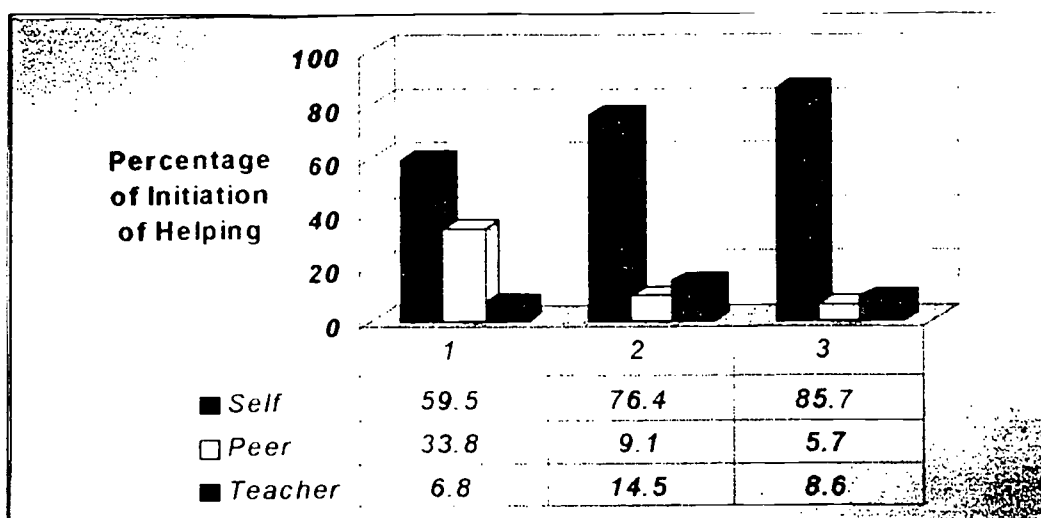
Figure 2: Percentage of Self-Initiated, Peer-Initiated, and Teacher-Initiated Helping Across Sessions.

	1	2	3
■ Self	59.5	76.4	85.7
□ Peer	33.8	9.1	5.7
■ Teacher	6.8	14.5	8.6

In contrast, children's sharing behavior was similar across the three sessions χ^2 (4, N = 190) = 2.01, ns. On average, 60% of the time children either requested a turn or negotiated over turntaking, 26.3% involved sharing, and 13.7% refusals to share (see figure 3). The amount of self-initiated versus elicited sharing remained similar across the three sessions χ^2 (4, N = 50) = .51, ns. Most sharing or sharing offers occurred when elicited by a peer's request (44%), a teacher request (24%), self-initiated (18%), and when supported by a teacher (14%) (see figure 4). Interestingly, self-initiated sharing increased, and sharing in response to facilitator supported peer requests was non-existent during the third session, indicating somewhat more independent conflict resolution.
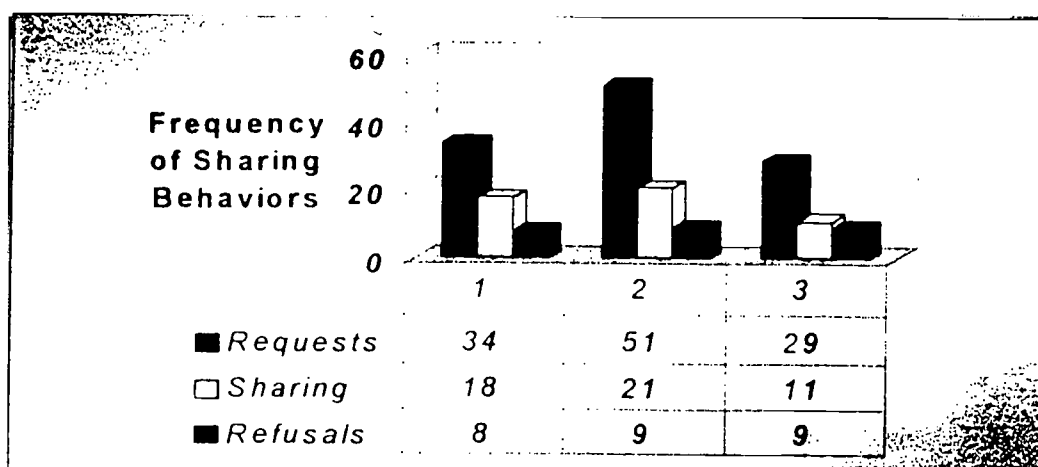

	1	2	3
■ Requests	34	51	29
□ Sharing	18	21	11
■ Refusals	8	9	9

Figure 3: Frequency of Requests, Sharing, and Refusals Across Sessions.
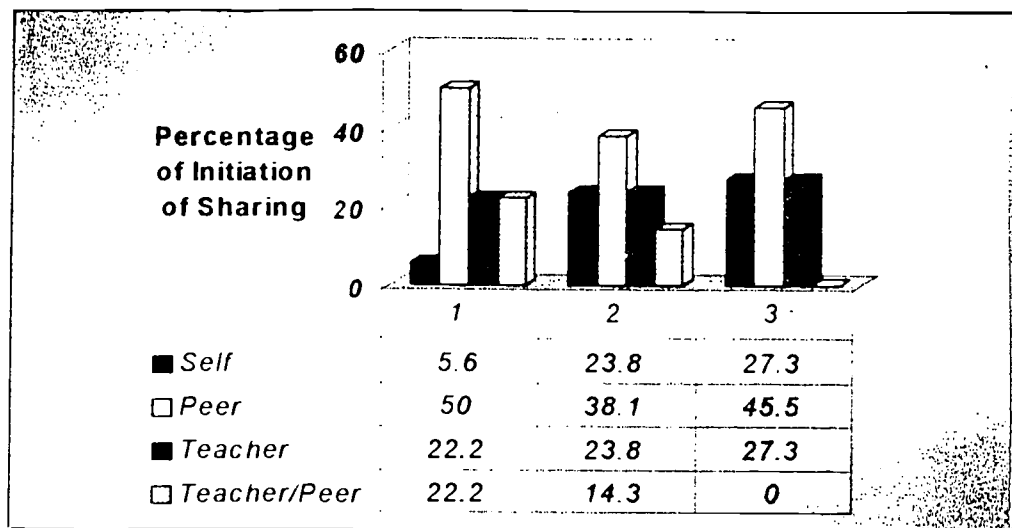
Figure 4: Percentage of Self-Initiated, Peer-Initiated, Teacher-Initiated, and Teacher/Peer-Initiated Sharing Across Sessions.

Children shared the mouse 41 times across the 3 sessions (13 times session 1, 18 times session 2, 10 times session 3). However, 9 additional times when the mouse was offered students did not take it. The majority of these refusals (8/9) involved children with motor delays, who were eventually coaxed by the teacher to use the mouse with the help of a peer.

Adult Intervention

Overall the facilitator used more utterances in regard to sharing (82.2%) than helping (17.8%), indicating that sharing behavior required more intervention. As predicted, the number of adult utterances decreased over time, but more for helping than sharing χ^2 (2, N =197) = 8.134, p< .017 (see figure 5).
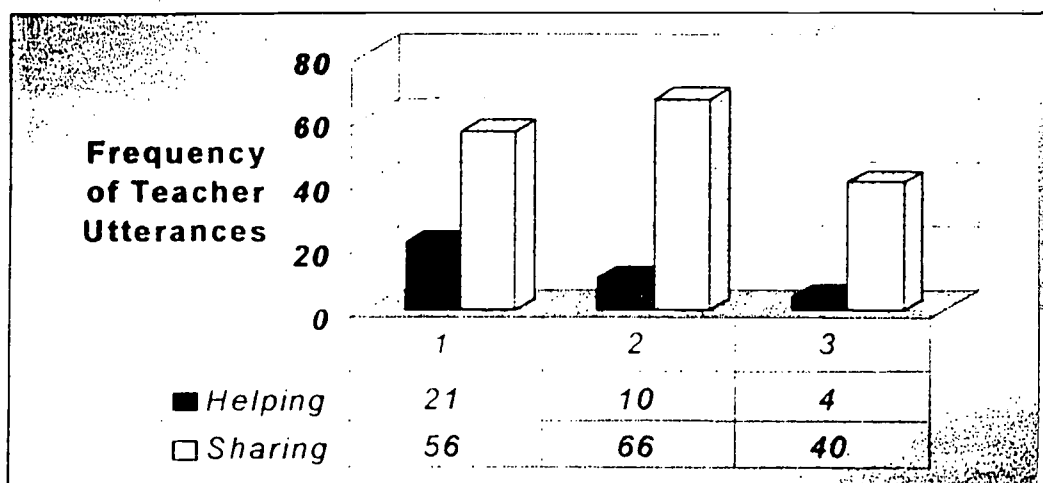
	1	2	3
■ Helping	21	10	4
□ Sharing	56	66	40

Figure 5: Frequency of Facilitator Sharing and Helping Utterances Across Sessions.

Discussion

As predicted, children improved in their ability to collaborate when using the computer, and adult intervention decreased. As expected for preschoolers, sharing was the more difficult task and required a higher level of facilitation by the adult. With additional sessions children may have become more skilled at negotiating over the use of the mouse. The computer, however, serves as a highly motivating tool to practice such skills in young children.

Overall, the affective tone at the computer was very positive, and children enjoyed working with each other. We were impressed by the amount of language used, particularly since eight of the fourteen children had some type of speech and/or language delay. One child was silent the entire time she was at the computer—except when helping a peer. Special attention, however, needs to be paid to children with motor difficulties, so they have the support needed to participate in computer activities.

Researchers have questioned the use of computers in the preschool classroom, indicating that high levels of adult assistance are needed, child control is decreased, play is diminished, and peers become isolated (Henninger, 1994). On the contrary, our results indicate that with some initial facilitation it is the children who 'run' the computer center, becoming experts in using the programs, collaborating together and assisting each other. Thus computers, when used appropriately, have the potential to facilitate the development of important social skills needed for entry into kindergarten.

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Examples of Collaboration Among Peers

Brittany: I can't do it (Brittany has the mouse).

Facilitator: Do you need some help?

Amanda: I will help you (and takes the mouse).

Facilitator: I was just going to say...that's the person you should ask. You can ask Amanda.

Brittany: Go to the one that matches this one [the pattern]...ok?

(Here, the computer user must pick shoe sizes that match what the computer says.)

Computer: I'm little, I need new shoes.

Dustin: Which shoes? (Dustin has the mouse.)

William: Sandals (pointing to small shoes).

Dustin: What shoes, Jordan?

Nathan: These ones (pointing to small shoes).

Jordan: No, these shoes (pointing to medium shoes).

Dustin: No Jordan, the ones Nathan said.

Taking turns

Dustin: We get two turns, OK? OK, Rachael?

Computer: There you go! 2. Now put the same number of objects on your stage.

Dustin: 1, 2. (gives the mouse to Rachael).

Facilitator: Good job.

Dustin: Rachael's turn.

Facilitator: Good job. I'm glad to hear you're sharing.

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Encouraging language use

(When at the computer, Katie was silent except when she helped Nathan.)

Computer: Here's little. I'm little. I have cold toes.

Katie: That shoe (pointing to the small one).
              Click that shoe.
              Here, I'll show you (and puts her hand on Nathan's to help).

Nathan: Wait a minute (but lets her help).

Computer: These fit. Thank you.

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