
Fine Motor Activities in Head Start and Kindergarten Classrooms

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KEY WORDS

- curriculum development
- early childhood
- skill link

OBJECTIVE. The purpose of this study was to describe and compare the fine motor activities in Head Start and kindergarten classrooms in order to open a dialogue between the two contexts about the fine motor activities children in preschool will face in kindergarten.

METHODS. Children in 10 Head Start and 10 kindergarten classrooms were observed for 1 day each. Time spent in activities was categorized into four groups: fine motor activities with no academic purpose, fine motor activities with academic purpose, academic activities with no fine motor component, and nonacademic activities with no fine motor component. Percentages of time were calculated and *t* tests were used for comparison between contexts.

RESULTS. Children in Head Start spent 27%–46% (mean of 37%) of the in-class day in all fine motor activities whereas children in kindergarten spent 36%–66% (mean of 46%). For children in kindergarten, 42% of total fine motor activity time involved paper and pencil activities. In contrast, children in Head Start spent 10% of total fine motor activity time in paper and pencil activities.

CONCLUSION. The higher mean percent of time spent in fine motor activities in kindergarten classrooms suggests a developmentally appropriate increase in fine motor demands. The percent of paper and pencil activity time the children engaged in substantially increased from Head Start to kindergarten. The findings describe a difference between the two environments, informing Head Start of the fine motor demands their graduates face in kindergarten.

Marr, D., Cermak, S., Cohn, E. S., & Henderson, A. (2003). Fine motor activities in Head Start and kindergarten classrooms. *American Journal of Occupational Therapy, 57*, 550–557.

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The acquisition of fine motor skills is an important aspect of children's developmental growth as fine motor skills enable children to participate in valued occupations in the areas of activities of daily living, education, play, and social participation. National education goals describe fine motor skills as one of the dimensions needed by kindergarten children for learning readiness (National Education Goals Panel, 1993). Both early childhood educators and pediatric occupational therapists focus on developing fine motor skills in preschool children to enhance readiness for learning (Case-Smith, 2000; Kagan, Moore, & Bredekamp, 1995). Within the educational community the specific fine motor criteria for school readiness have not been universally established. Before fine motor criteria for school readiness can be established, greater understanding of the current fine motor activities of early learning environments such as preschool and kindergarten classrooms is needed. This increased understanding may assist educators and therapists to better prepare preschool children, especially those at-risk for fine motor delays, for the kindergarten experience. The purpose of the present study is to describe and compare the fine motor activities in preschool and kindergarten classrooms.

School Readiness

School readiness has been defined as a process of acquiring the foundational skills needed to learn new activities (Slavin, Karweit, & Wasik, 1994). Traditionally, school readiness refers to specific skills acquired by children before entering kindergarten. The National Association for the Education of Young Children (NAEYC) rejects this definition of school readiness as it is based on an assumption that there is a predetermined set of skills children need before entering school (NAEYC, 1990, 1995). Instead, NAEYC argues that early learning and development are multidimensional, complex, and influenced by individual, cultural, and contextual variation. For the NAEYC, school readiness is considered a fluid process and is not meant to be used as a threshold criterion for the preschooler's admission into kindergarten. School readiness represents guidelines that can inform parents and preschool teachers on developmental progress. Readiness, as defined by the NAEYC, encompasses the five dimensions outlined by the National Education Goals Panel (1993): (1) physical well being and motor development, (2) social and emotional development, (3) approaches toward learning, (4) language development,

and (5) cognitive and general knowledge. Fine motor skill is included in the first dimension and is further defined by the panel as the developmental sequence of manual skills requiring precision and manual dexterity (e.g., cutting with scissors or fastening buttons).

The U.S. Department of Education and the National Center for Research Statistics have proposed a conceptual framework of readiness (West, 2000). The framework is based on the assumption that the development of readiness for school begins at birth and continues until the child enters school. Proposed factors contributing to readiness are interrelated and include the child's characteristics, family resources, health care resources, nonparental care and education programs, and community resources (see Figure 1). The framework identifies the development of fine motor skill as an outcome of growth and development, but this development clearly is influenced by all other factors in the framework.

Some educators use the term readiness to imply that schools need to be "ready" for children rather than children being ready to enter school (Saluja, Scott-Little, & Clifford, 2000). A school is "ready" when teachers have a solid

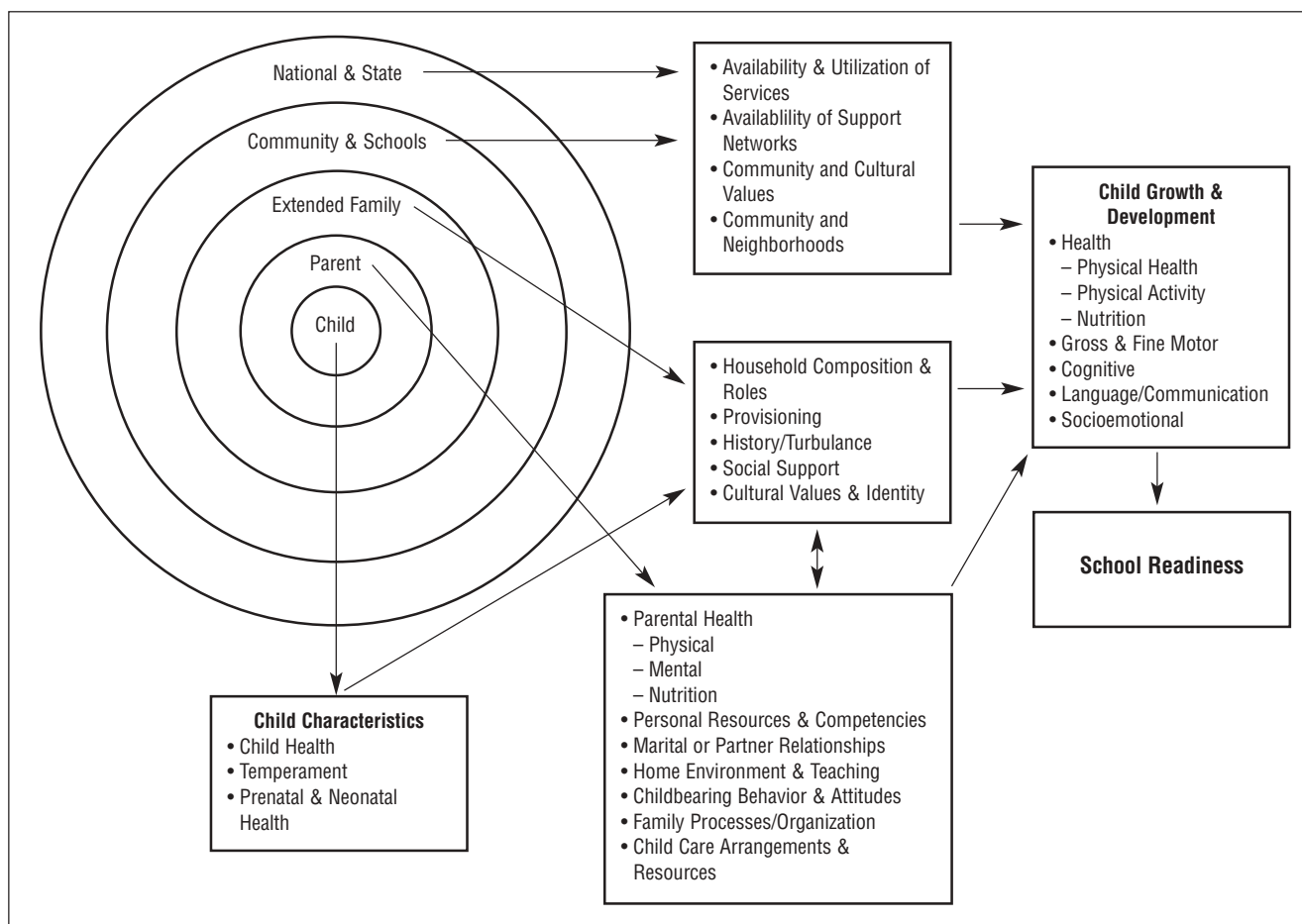


Figure 1. Readiness Model (West, 2000, p. 8)

understanding of child development, respect the individualized nature of development, and incorporate various cultural and ethnic issues into curriculum (Edwards, 1999; NAEYC, 1996). Educational systems as a whole can be “ready” for children by providing strong transitional services from preschools to kindergartens. These services include improved communication from preschool to kindergarten in order to create a “skill link.” A “skill link” is when preschools are informed of the skill expectations of the kindergarten classes and develop curriculum to promote those skills (Kraft-Sayre & Pianta, 2000).

To facilitate the creation of skill links between preschool and kindergarten environments, the demands of both contexts should be examined and compared. In the fine motor domain, knowing the types of fine motor activities kindergartners commonly face will help educators and therapists develop curricula to prepare preschool children for those fine motor activities. McHale and Cermak's (1992) observations of the fine motor demands in typical 2nd-, 4th-, and 6th-grade classrooms help us understand the fine motor activities in these grades. Across the three grades, a range of 30% to 60% of the children's school day was spent in fine motor activities. An average of 85% of the total fine motor time across the three grade levels was spent on paper and pencil activities. These findings indicate the high demand for fine motor skill in middle to older elementary children. Descriptions of the fine motor activities in preschool and kindergarten classrooms in a similar manner are not available.

Preschool children from families with limited financial resources may be at risk for delayed skills including fine motor skills, limiting their readiness for kindergarten. Bowman and Wallace (1990) found that 22 preschool children from low to low-middle economic communities scored significantly lower on the Developmental Test of Visual Motor Integration (VMI; Beery, 1997) than 22 matched children from high socioeconomic communities. Performance on the VMI relies on fine motor skill as children must use a pencil to copy geometric shapes. In a national study of 22,000 kindergartners conducted by the U.S. Department of Education, 12% were children from families who utilized Assistance to Families with Dependent Children (AFDC). The study found that 44% of kindergartners from families using AFDC scored one or more standard deviations below the mean on fine motor skills indicating they are possibly at risk for later fine motor developmental difficulties (West, Denton, & Germino-Hausken, 2000). Head Start is a federal preschool education program specifically designed to help children from families with low income (Ripple, Gilliam, Chanana, & Zigler, 1999; Washington & Bailey, 1995; Zigler &

Valentine, 1979). West et al. (2000) found that children from families with incomes below poverty who had attended Head Start in the prekindergarten year ($n = 712$) had significantly lower fine motor skills in kindergarten than children from families with incomes above poverty who had not attended Head Start ($n = 12,377$). These results suggest that preschool children from families with low income are at risk for delayed fine motor skills that may influence their school performance in the early elementary years.

Because children in Head Start programs may be at risk for fine motor delays, research is needed to examine features of the Head Start experience that may influence fine motor development and to provide information regarding a fine motor skill link between Head Start and kindergarten classrooms. The present study begins this process by describing and comparing the fine motor activities of prekindergarten children in Head Start classrooms with the fine motor activities of children in kindergarten classrooms. The question addressed in this study was: What are the types of fine motor activities and what is the time spent in those activities in Head Start and kindergarten classrooms?

Methods

Design and Participants

A descriptive design was conducted with a convenience sample of Head Start and kindergarten classrooms. Written or verbal contact was made with prospective teachers in a two-county region and those responding positively were included in the study. Recruitment of classrooms ended when 10 Head Start and 10 kindergarten teachers agreed to participate. Informed consent from individual children was not obtained as the study was found to be exempt from human subjects approval by the Institutional Review Board of Boston University since the participants were the “classrooms” and the data collected were typical classroom activities.

Observations were scheduled at the convenience of the teacher and observer and were conducted for 1 full day in each of 10 full-day Head Start classrooms and 10 full-day kindergarten classrooms. The Head Start classrooms were from a single Head Start agency whereas the kindergarten classrooms were from four different school districts, all in a single suburban–rural area of upstate New York. The average income of families in the two counties represented in the study was \$32,494 (National Association of Counties, 2001). This average was lower than the \$36,369 average income for New York State (U.S. Census Bureau, 2002).

Measures and Procedure

Before each observation began, each Head Start and kindergarten classroom teacher was asked to identify one boy and

one girl in his or her classroom who had average fine motor skills. The teachers were not provided with a specific definition of average fine motor skills but were asked to “think of a child who was neither the best nor the worst, someone in the middle.” In Head Start classrooms, to focus on the prekindergarten children, only the 4-year-old children were considered for observation. The two identified children were selected to represent the classroom and served as the focus of the observation. Their activities were recorded for 1 entire school day. Since many times during the day different activities were going on at the same time, it was necessary to observe individually identified children. In total, 40 children were observed (20 boys and 20 girls). None of the children had observable disabilities; no other descriptive data on the children were collected.

Throughout the observation, either the first author or a trained research assistant sat in an unobtrusive location in the classroom and did not participate in the children’s activities. Data were recorded and coded using a method adapted from McHale and Cermak (1992). This method included recording the clock time when activities started and stopped as well as a narrative description of the actual activities in which the children were engaged.

Prior to data collection, interrater reliability on observation and coding between the first author and the research assistant was established using percent agreement and the Kappa statistic, a chance-corrected measure of agreement (Portney & Watkins, 2000). To establish observation reliability, both observers simultaneously observed six children on 3 different school days (two children per observation). The percent agreement and Kappa statistic were calculated by comparing minute-by-minute agreement on the documented activities of each child. The average percent agreement for the six observations was .76. The average of the six observations using the Kappa statistic was .67 (range .64–.73). To establish coding reliability, each observer separately observed, documented the time, and described the activities of three children on 3 different school days. The two observers then independently coded the activities into the four categories described below. The average percent

agreement was .82. The average Kappa statistic was .76 (range .51–.93). Both Kappa results are considered substantial (Portney & Watkins, 2000).

Data Analysis

Classroom activities were coded into four categories adapted from McHale and Cermak (1992): fine motor activities with no specific academic purpose; fine motor activities that had specific academic purpose; academic activities that did not include a fine motor component; and nonacademic, non-fine motor activities (see Table 1 for examples of activities in each category). Fine motor activities were defined as those tasks requiring major use of one’s hands. An activity with an academic purpose was defined as one where an educational concept was being taught or reinforced such as letter recognition or categorization. The children’s time spent in each of the four categories was calculated. The time spent in activities that took place outside the classroom (i.e., lunch for kindergarten, recess for both classrooms, and “specials” such as music, physical education, library, computer training, art for both classrooms) was excluded from analysis, as these were not directly observed. Lunch took place in the classroom for children in Head Start but was excluded from analysis for consistent comparison across classrooms. The clock time for the two children in each class was averaged to reflect the mean time spent on fine motor experiences in each classroom. This calculation resulted in 10 observations of each context for analysis. To determine the total minutes of in-class activities during the school day, excluded activity minutes (i.e., lunch, recess, and specials) were subtracted from the total number of minutes in the school day resulting in adjusted school-day minutes.

Results

The mean length of the Head Start and kindergarten day and the mean number of adjusted minutes (total minutes minus excluded activity minutes) are presented in Table 2. Since there was a significant difference in the number of

Table 1. Examples of Activities Coded for Each Category

Fine Motor/ No Academic Content	Fine Motor/ With Academic Content	Academic Content/ No Fine Motor	No Academic Content/ No Fine Motor
Eat snack or breakfast	Fingerplays	Oral spelling	Waiting
Fingerplays	Write letters or numerals	Reciting	Gross motor activity
Art activities	Cut or glue on a worksheet	Oral Counting	Sing songs
Manipulative play (i.e., Legos®, playdough)	Draw or color on a worksheet	Teacher instructing	Watch a video
Play in centers (i.e., blocks, sandtable)	Point to letters or words	Teacher reading	Clean up
Hygiene tasks	Read or look at a book	Sing songs	Talk to teacher
Don/doff coats			Rest time

Note. Some activities could be coded in more than one category based on the specific content of the activity (i.e., fingerplays with fine motor and academic content were concerned with counting while fingerplays with fine motor but no academics revolved around a holiday theme only)

Table 2. Mean and Range of Minutes in the Head Start and Kindergarten Day

	Head Start	Kindergarten
Total Minutes in School Day		
<i>M</i>	346	374
<i>SD</i>	9	20
range	337–368	344–400
Total Excluded Activity Minutes		
<i>M</i>	55	102
<i>SD</i>	27	25
range	15–98	75–108
Total Adjusted Minutes		
<i>M</i>	291	272
<i>SD</i>	23	32
range	248–326	199–311

total minutes daily between Head Start and kindergarten classrooms ($t = 3.9, p < .001$), data were examined using percent of minutes. The mean number of minutes, range of minutes, and mean percent of adjusted school-day minutes children spent in each category of classroom activity across all of the Head Start and kindergarten classrooms are presented in Table 3. Using the Bonferroni method, each t test required a p value of .01 for significance. When comparing Head Start and kindergarten classrooms in each of the four categories, a statistically significant difference was found for percent of time in three of the four categories: fine-motor, nonacademic; non-fine motor with academics; and non-fine motor, nonacademics (see Table 3). In Head Start, fine motor nonacademic activities and non-fine motor, nonacademic activities constituted a majority of the in-class activities (90% total), while time spent in the kindergarten day was more evenly split among the four categories. The range of minutes for each category was large in both Head Start and kindergarten indicating that there was a wide variation in the way time was scheduled in both types of classroom.

To compare the amount of time spent in fine motor activities in the Head Start and kindergarten classrooms, the two fine motor categories (with and without academics)

Table 3. Percent of Adjusted Minutes in Categorized Activities^a

Activity Category	Head Start	Kindergarten	t (df)
Fine Motor; Nonacademic			
<i>M</i>	35%	26%	2.5 (18)
range	27%–44%	14%–45%	
Fine Motor; With Academics			
<i>M</i>	2%	20%	-4.5* (18)
range	0%–8%	3%–44%	
Non-Fine Motor; With Academics			
<i>M</i>	8%	23%	-6.3* (18)
range	4%–15%	12%–37%	
Non-Fine Motor; Nonacademic			
<i>M</i>	55%	31%	6.4* (18)
range	47%–64%	14%–46%	

Note. df = degrees of freedom.

^aPercent is based on the adjusted minutes, which are the total number of minutes in a school day minus the minutes for specials, recess, and lunch.

* $p < .01$

were combined to describe total fine motor time. Children in Head Start spent, on average, 37% (range of 27%–46%) whereas children in kindergarten spent 46% (range of 36%–66%) of their categorized classroom activities engaged in fine motor activities. While these mean percentages of total fine motor time are only nine percentage points apart, a breakdown of total fine motor time reveals that children in Head Start spent a higher percent of the day in fine motor, nonacademic activities (35%) with only 2% in fine motor with academic activities. In contrast, children in kindergarten spent more equal amounts of time in fine motor, nonacademic (26%) and academic (20%). As would be expected, the younger children (in Head Start) spent relatively more time than children in kindergarten in fine-motor, nonacademic activities, whereas the older children (in kindergarten) spent more time than Head Start children in fine motor activities with academics.

A more detailed examination of the fine motor activities in which the children engaged revealed three broad types of activities for both classroom settings; self-care, manipulative, and paper and pencil activities. The first category, representing 45% of total fine motor time in Head Start and 14% of total fine motor time in kindergarten, was self-care (e.g., handwashing, toileting, opening milk and treats for snack, eating breakfast, and donning and doffing a coat). The second category, labeled manipulating objects or the hands for play or learning, included such activities as cutting, Legos®, playdough, puzzles, finger plays, and parquetry blocks; this category represented 46% of total fine motor time in Head Start and 44% of total fine motor time in kindergarten. In some classes, manipulative play was part of free play, but manipulative play was also used as an activity option in kindergarten for students once assigned seat work was completed. This option resulted in more manipulative time for students who finished their seat work quickly.

The third category of fine motor activity was paper and pencil activities for either play or learning. Paper and pencil activities were defined for this study as any activity involving writing or coloring with a pencil, crayon, or marker, or painting with a paintbrush. This category represented 10% of total fine motor time in Head Start and 42% of total fine motor time in kindergarten. Paper and pencil time was further divided into either teacher-directed paper and pencil activities, or paper and pencil activities observed during free play. Forty-one percent of paper and pencil time in Head Start was teacher-directed whereas the teacher-directed paper and pencil time during the kindergarten day was 93%. One half of one percent of paper and pencil activities in Head Start and 15% in kindergarten were projects combining writing or coloring with cutting and gluing activities.

Discussion

Children in Head Start spend a little more than one third (37%) and children in kindergarten spend almost one half (46%) of their in-class day in some type of fine motor activity. The difference in fine motor time between the two types of classrooms suggests that the fine motor demand in kindergarten increases from Head Start to kindergarten. The gap between the two environments is not large and suggests an appropriate developmental increase for this age group. McHale and Cermak (1992) found, on average, 30 to 60% of the 2nd- to 6th-grade day was spent in fine motor activities. The findings reported in this paper combined with the results from McHale and Cermak serve as a communication (skill link) to educators and occupational therapists on the fine motor time demands in the early school years.

Comparing the percent of fine motor time spent in more specific types of fine motor activities indicates that the percent of manipulative activities is very similar in Head Start and kindergarten classrooms (46% vs. 44%). The kindergarten teachers participating in this study expressed the opinion that preschool teachers should immerse children in manipulative play to prepare children's hands for the more challenging fine motor demands in kindergarten. The time engaged in manipulative activities would suggest that children in Head Start are, in fact, spending large amounts of time in fine motor activities. Further research to explore the assumption that preschool manipulative play prepares kindergarten children for handwriting and other paper and pencil tasks is needed.

The percent of time spent in self-care activities in the two environments is quite different (45% vs. 14%). This can be partially explained by the fact that every Head Start classroom had breakfast compared to only one kindergarten classroom. Additionally, Head Start curriculum emphasizes personal hygiene activities such as tooth brushing and hand washing. Both of these self-care activities occurred several times each day in the Head Start classroom schedule, but were less emphasized in kindergarten classrooms. The emphasis on self-care activities in Head Start is important and supports Head Start's focus on health (Head Start Bureau, n.d.).

The percent of time children spent in paper and pencil activities was also different in the two types of classrooms. McHale and Cermak (1992) reported that 85% of all fine motor time in 2nd-, 4th-, and 6th-grade classrooms was spent in paper and pencil activities, whereas the study reported here found children in kindergarten spending 42% of their fine motor time in paper and pencil activities. The children in Head Start spent 10% of their fine motor

time in paper and pencil activities. This increase across the preschool and elementary grades is appropriate as children in Head Start and kindergarten are only beginning to engage in paper and pencil activities, including handwriting, while in the older grades, handwriting is a basic tool of learning. The large increase in time spent on paper and pencil activities from Head Start to kindergarten serves as a skill link, informing Head Start of the paper and pencil time demands in the kindergarten classroom. Because Bowman and Wallace (1990) and West et al. (2000) both found that preschool children from low-income or poverty families scored significantly lower on fine motor evaluations than preschool children from nonpoverty families, Head Start personnel may consider whether the curriculum ensures that children graduating from Head Start have the readiness skills to successfully meet the paper and pencil demands in kindergarten.

Several factors need to be considered when examining the difference in paper and pencil time. First, all Head Start classrooms observed included both 3-year-old and 4-year-old children, although only activities of 4-year-olds were observed for this study. While the 4-year-olds may benefit by having more paper and pencil time, the 3-year-olds may not be developmentally ready for such activities. Engaging the younger children in paper and pencil activities for which they are not developmentally ready may set them up for a negative experience. Second, trade-offs need to be considered. If additional time is spent in fine motor activities, there may be a reduction in other scheduled activities and experiences. A third consideration may be that time devoted to paper and pencil activities increases over the course of the school year. All classrooms were observed in the fall. Head Start teachers may modify schedules as the year progresses to include more paper and pencil activities for the prekindergarten children. Finally, offering an activity during the Head Start day, especially during free play time, does not ensure that children actually engage in that activity. All of the observed Head Start classrooms in the present study offered paper and pencil activities (e.g., a writing center) while only 14 of the 20 Head Start children in this study engaged in any of these paper and pencil activities during the course of the day. The discrepancy between offering an activity versus children actually engaging in the activity is another area for further research. With almost all of the paper and pencil time in kindergarten being teacher-directed, Head Start may wish to examine the effects of an adjustment in teacher-directed activities as well, especially for the prekindergarten children near the conclusion of the preschool year. The relationship between the amount of time spent in

preschool paper and pencil activities and readiness for kindergarten paper and pencil activities also needs further examination.

Limitations

A limitation of this study was the challenge of coding activity in the classroom, resulting in only moderately high interrater reliability for the present study. At times, the observers found it difficult to determine if all activities involving the hands and fingers such as holding up a flash card or covering the heart during the Pledge of Allegiance had a “strong enough” fine motor component to be categorized a fine motor activity. Another limitation of this observational study was the localized, rural geographical area of the classrooms thus minimizing generalization to broader areas or to urban districts.

Future Study

Further study comparing time use in non-Head Start preschool classrooms to Head Start classrooms may provide insight into the potential similarities and differences in these two preschool settings. Observing students from Head Start and non-Head Start programs into later elementary years would inform both occupational therapists and educators about the relationship of various levels of time spent in fine motor activities to preparedness of children for the fine motor demands of kindergarten. Finally, comparing the amount of time spent in fine motor activities at the beginning of the academic year to the latter part of the academic year would add further information about the changes in classroom experiences of children across the preschool year.

Conclusion

In summary, children in Head Start spent about one third of their day in fine motor activities while children in kindergarten spent about half of their day engaged in fine motor activities. Examination of the specific types of fine motor activities indicated that both groups spent similar amounts of time in manipulative activities (almost half of fine motor time) but children in Head Start spent relatively greater percentage of fine motor time in self-care activities, and kindergarten children spent a substantially greater percentage of fine motor time in paper and pencil activities. This difference in paper and pencil activity time serves to inform Head Start of the demands that their graduates will face in kindergarten. ▲

Acknowledgments

A special note of appreciation goes to Jennifer Doxtator, OTS, who served as a research assistant for this study.

This study was supported in part by a leadership training grant to Boston University from the U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau (MCJ-000-901), and by a grant from the American Occupational Therapy Foundation.

This study was completed in partial fulfillment of the first author's requirements for the degree of Doctor of Science in Therapeutic Studies at Boston University.

References

- Beery, K. (1997). *The Beery-Buktenica Developmental Test of Visual-Motor Integration* (4th ed.). Parsippany, NJ: Modern Curriculum Press.
- Bowman, O. J., & Wallace, B. (1990). The effects of socioeconomic status on hand size and strength, vestibular function, visuomotor integration, and praxis in preschool children. *American Journal of Occupational Therapy, 44*, 610–621.
- Case-Smith, J. (2000). Effects of occupational therapy services on fine motor and functional performance in preschool children. *American Journal of Occupational Therapy, 54*, 372–380.
- Edwards, D. (1999). Public factors that contribute to school readiness. *Early Childhood Research and Practice, 1*, 1–11. Retrieved August 24, 2000, from <http://ecrp.uiuc.edu/v1n2/edwards.html>
- Head Start Bureau. (n.d.). *Head Start fact sheet*. Washington, D.C.: Author. Retrieved August 27, 1998, from <http://www.acf.dhhs.gov/programs/hsb/hsbgen.htm>
- Kagan, S. L., Moore, E., & Bredekamp, S. (Eds.). (1995). *Reconsidering children's early learning and development: Toward shared beliefs and vocabulary*. Washington, DC: National Education Goals Panel. Retrieved December 27, 2000, from <http://eec.negp.gov/Reports/child-ea.htm>
- Kraft-Sayre, M., & Pianta, R. (2000). *Enhancing the transition to kindergarten*. Charlottesville, VA: National Center for Early Development and Learning. Retrieved December 29, 2000, from <http://www.fpg.unc.edu/~ncedl/PDFs/transman.pdf>
- McHale, K., & Cermak, S. (1992). Fine motor activities in elementary school: Preliminary findings and provisional implications for children with fine motor problems. *American Journal of Occupational Therapy, 46*, 898–903.
- National Association for the Education of Young Children. (1990). *Guidelines for appropriate curriculum content and assessment in programs serving children ages 3 through 8*. Washington, DC: Author.
- National Association for the Education of Young Children. (1995). *NAEYC position paper on school readiness*. Washington, DC: Author. Retrieved September 2, 2000, from <http://www.naeyc.org/about/psredy98.htm>

- National Association for the Education of Young Children. (1996). *Developmentally appropriate practice in early childhood programs*. Washington, DC: Author. Retrieved December 28, 2000, from http://www.naeyc.org/resources/position_statements/dap3.htm
- National Association of Counties. (2001). *About counties*. Washington, DC: Author. Retrieved March 4, 2002, from <http://www.naco.org>
- National Education Goals Panel. (1993). *Reconsidering children's early development and learning: Toward common views and vocabulary*. Washington, DC: Author. Retrieved March 27, 2000, from <http://www.negp.gov/reports/child-ea.htm>
- Portney, L., & Watkins, M. (2000). *Foundations of clinical research: Application to practice* (2nd ed.). Stamford, CT: Appleton & Lange.
- Ripple, C., Gilliam, W., Chanana, N., & Zigler, E. (1999). Will fifty cooks spoil the broth? *American Psychologist*, *54*, 327–343.
- Saluja, G., Scott-Little, C., & Clifford, R. (2000). Readiness for school: A survey of state policies and definitions. *Early Childhood Research and Practice*, *2*, 1–19. Retrieved December 29, 2000, from <http://www.ecrp.uiuc.edu/v2n2/saluja.html>
- Slavin, R., Karweit, N., & Wasik, B. (1994). *Preventing early school failure: Research, policy, and practice*. Needham Heights, MA: Allyn and Bacon.
- U.S. Census Bureau. (2002). *State and county quickfacts*. Retrieved April 17, 2002, from <http://quickfacts.census.gov/qfd/states/36000.html>
- Washington, V., & Bailey, U. J. (1995). *Project Head Start: Models and strategies for the twenty-first century*. New York: Garland Publishing.
- West, J. (2000). *Early childhood longitudinal study: Birth cohort 2000*. Washington, DC: National Center for Educational Statistics, U.S. Department of Education.
- West, J., Denton, K., & Germino-Hausken, E. (2000). *America's kindergartners*. Washington, DC: National Center for Educational Statistics, U.S. Department of Education.
- Zigler, E., & Valentine, J. (Eds). (1979). *Project Head Start: A legacy of the war on poverty*. New York: Free Press.