

Effects of quality early care on school readiness skills of children at risk

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Brain research has strengthened our understanding of the first five years of a child's life as a critical period. Quality early care is important to the healthy development of young children, and their later success in school. Concurrently, many families depend on childcare outside the home. Programs that have knowledgeable and skilled staff, offer a stimulating and supportive environment, provide individualized and developmentally appropriate activities for each child, reach out to parents to gain their involvement, collaborate with community resource partners and empower the family's capacity to ensure optimal care for their children have shown much success. Many of these comprehensive programs have been particularly effective with children identified as having special needs, being economically disadvantaged or speaking a native language other than English. The Judith P. Hoyer Early Child Care and Family Education Centers (Judy Centers), implemented by the Maryland State Department of Education, is one such initiative. Through the Judy Centers, schools or childcare facilities provide quality and comprehensive early care and development services to children age birth to five and their families. Early indications are that the Judy Center services are significantly effective in ensuring children who have special needs, receive free or reduced meals, and qualify for English as a Second Language services are prepared for school and ready to learn.

Keywords: *Quality early care; School readiness*

Introduction

Quality early learning experiences contribute to the healthy development and well-being of children. Recent findings substantiate the critical role of the environment for optimal neurological development, particularly in the early years. Nationally, nearly

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60% of children ages five or younger are in childcare on a regular basis and 44% of infants are in childcare for more than 30 hours a week. Additionally, the number of dual-income families and single parents is increasing, resulting in less parental care at home and more use of childcare in centers and family homes.

The National Education Goals Panel, along with the No Child Left Behind Initiative, has identified five major areas of development critical for school readiness: health and physical development, emotional well-being and social competence, approaches to learning, communication skills, and cognition and general knowledge (Saluja *et al.*, 2000). Results of a recent study (Wertheimer & Croan, 2003) report that approximately 31% of kindergarten students had at least one health or physical challenge, 20% lagged behind in cognitive development and 31% were behind in social and emotional development. Consequently, it is critical to ensure the availability of quality childcare and comprehensive developmental programs that assist families in preparing children to be ready for school and lifetime opportunities.

Research

Quality early care and learning

According to the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network (1993), participation in a quality early care and education program has been shown to enhance child performance outcomes. When childcare settings provide appropriate learning opportunities and have caregivers who are emotionally supportive and responsive to children's needs, children are happier, have closer and more secure attachments to caregivers and perform better on standardized cognitive and language tests (NICHD Early Child Care Research Network, 1999). According to the NICHD Early Child Care and Research Network (1998) the quality of early care is the number one predictor of child behavior. It is also widely accepted that high-quality childcare enhances cognitive developmental and socialization of children and improves performance on indicators of school readiness, regardless of ethnicity (Burchinal & Cryer, 2003). Similarly, Booth and Kelly (2002) concluded that children with significant development delays or biomedical risk factors showed more appropriate adaptive behaviors when exposed to quality early environments.

Quality early care and education programs are a precursor to optimal school readiness. Preschoolers who perform well on standardized cognitive tests had caregivers with higher levels of education and relevant training. These children also have better language skills, are more persistent in completing tasks, and are better prepared for school (Burchinal *et al.*, 2000). In the Carolina Abecedarian Project, children from low-income families who received full-time, high-quality child care from infancy through age five had higher cognitive test scores though age 21 than those who did not attend such a program. Specifically, academic achievement in reading and mathematics was higher for this population, and they were more likely

to continue their education to college. The Perry Preschool Project provided similar results about the value of comprehensive and quality care to three to four year olds. This long-term study tracked the participants through age 27. On average, those in the Project had fewer arrests, earned on average \$2000 more each month, owned their own homes, had graduated from high school or received a GED, and had higher achievement scores at age 14 and literacy scores at age 19 than their counterparts with similar social and economic challenges (High Scope Educational Research Foundation).

Teacher and staff knowledge and skills

A critical feature of any quality early care and learning program is knowledgeable and skilled staff. There is increasing evidence that exposure to positive relationships with adults can assist in protecting a child from negative early experiences (NICHD Early Child Care and Research Network, 1999). Young children who receive continuity of care by trained adults who understand and implement developmentally appropriate curriculum and activities are better equipped for life's academic and social emotional experiences (Peisner-Feinberg *et al.*, 1999; Howes *et al.*, 2000). Kagan and Neuman (1996) found that formal training in early childhood education not only yields higher quality teacher behaviors, but can be linked to improved child outcomes. Teacher training shows more significant results than years in service and education level in regard to language facilitation, concept promotion and quality caregiving, according to Hirallal and Honig (1998).

Family services and involvement

Parents with good literacy, parenting and job skills can increase the chance of their children's academic success, as well as improve the quality of life of the whole family. According to the 'Assets Framework' model for enhancing child outcomes, young people need support from families that are empowered to provide opportunities for their healthy development. Parents must be able to engage in and support their children's education at school and in the community, particularly during the early years.

Parents at risk are better able to foster their children's development when they receive support through school and community services such as family literacy, parenting education, job skills training, adult education and GED classes, and child care. Single-site centers and community partnerships between schools and community agencies have shown particular success in assisting parents in the child-rearing process (Dwyer, 1995; Tao *et al.*, 1998). Therefore, providing training to parents that enables them to be more personally successful and fulfilled, and to more effectively promote their children's learning at home and achievement in school is an essential component in any early learning and care program.

Methods

Subject sites

To enhance school readiness in Maryland, the General Assembly has invested more than \$4 million annually in a program designed to coordinate the essential services to children and families at-risk during their early years. Beginning in 2001, the state provided funds to the Maryland Department of Education (MDE) to establish Judith P. Hoyer Early Child Care and Family Education Centers (Judy Centers) to provide children and families with high-quality and comprehensive early care and education and support services. The mission of the Judy Centers is to provide comprehensive, integrated, full-day full-year services that promote school readiness for children birth through age five'. This mission requires the development of collaborative, integrated programs and approaches that support the young children in their development and families in their ability to support their child's early learning. Judy Centers foster a child's school readiness through programs and services that enhance social and emotional, linguistic and early literary, cognitive and physical development.

A central theme of the Judy Center service delivery model is collaboration. By establishing collaborative ventures among local community agencies that serve young children and their families, Judy Centers have the potential to efficiently align local resources to achieve the desired result of improved school readiness. Judy Centers are staffed by a variety of specialists who are trained to recognize when a child or family requires additional services and to help connect the child or family to the appropriate providers. Judy Centers ensure high-quality early care and education by facilitating the appropriate combination of coordinated services to address the child's and family's specific needs.

At a minimum, Judy Centers are required to operate five programs including Pre-Kindergarten, Kindergarten, Preschool Special Education, Infants and Toddlers Program, and Before and After Child Care Services. Judy Centers are also required to provide at least five of the following services: Head Start, Family Support Centers or Healthy Families programs; early childhood education programs associated with colleges or universities; parent involvement programs; family literacy programs; public libraries services; or other home visiting, community health and regional child-care resource centers. Additionally, in defining the array of local programs and services, Judy Centers must ensure that 11 program components are included in the service delivery model. These include full-day/full-year service, provision for breakfast and lunch, service coordination (family case management), integration of early education services, family support services, early identification/intervention, special education and health-related services, and staff development is aligned with the Maryland Model for School Readiness, family involvement and accreditation/validation.

In its first year, 13 counties in Maryland hosted Judy Center programs housed in or linked programmatically to public schools. The programs are located in low-income areas, where the majority of families speak English as a second language and meet the poverty level. By the second year, 11 more Judy Centers were established.

Judy Centers are staffed by an array of specialists who are trained to recognize and support the needs of children and families. Judy Centers ensure high-quality early care and education by facilitating the appropriate combination of coordinated services to address each child's and family's specifically identified needs. Local collaboration is organized and structured around this needs assessment and service delivery model that maximizes local resources. By June 2003, 8202 children age birth through five had received services through the 24 Judy Center programs.

Procedures

To determine the impact of the Judy Center program on desired student outcome of school readiness, data were collected that allowed for comparison of children who had received services prior to kindergarten with those who did not. Evidence of school readiness focused on the academic outcomes defined by the MDE using the Work Sampling System (WSS[®]) assessment.

The WSS[®] is a performance-based assessment for pre-primary and primary education levels, using a portfolio format. The WSS[®] provides data in regard to a child's school readiness and performance, to date, relative to 30 indicators in seven major domains: personal and social development, language and literacy, mathematical thinking, scientific thinking, social studies, the arts, and physical development and health. Each WSS[®] domain consists of four indicators, with the exception of language and literacy, which has six indicators. Students' ratings for each indicator are assigned numerical values, and computed to derive the domain scores. The total score for all indicators results in a composite total score. Based on each score's value, domain and composite, children are assessed using one of three ratings: (1) developing readiness; (2) approaching readiness; and (3) full readiness (Maryland State Department of Education Report, 2003).

Maryland kindergarten teachers use the WSS[®] to assess children each fall, reflecting their first eight weeks of school. In addition, the Judy Center-linked kindergarten teachers reassess their students in the spring of the academic year. To address the subjectivity inherent in an evaluation of this nature, the MDE developed a systematic format for evaluating and interpreting children's learning. This system was aligned with the curriculum framework for classroom instruction and provided concrete safeguards against teacher bias.

To conduct the outcome analysis of the Judy Center Program, WSS[®] results from fall 2002 and spring 2003 were collected from the original 13 sites. A total of 990 kindergarten children participated in the outcome study. These students were divided into two comparison groups for outcome analysis. The focus of the analysis was to examine the impact of Judy Center program services of up to 14 months prior to kindergarten on students' performance during their kindergarten experience. A total of 434 (43.8%) of the students in the kindergarten sample had received the Judy Center services in the previous year. This group was identified as JC Cohort 1. JC Cohort 2 consisted of 556 (56.2%) children who did not receive any Judy Center services.

As shown in Table 1, the majority of children were white or African-American, with a little over 17% Hispanic and approximately 4% either Native American or Asian-American. At least 11% of students were included who had limited English proficiency (LEP) or qualified for special education services (SPED). Approximately 43% of the children were eligible for free or reduced meals (FARM).

It is important to note that in JC Cohort 1, the proportion of students in the three risk subgroups (limited English proficiency, special education, and free/reduced meals) was comparatively larger than in the JC Cohort 2 non-service group. For example, 57.1% of the Judy Center children were eligible for FARM, compared with 37.4% of the non-Judy Center group. Over 16% of the cohort who participated in the Judy Center program met eligibility requirements for SPED, whereas only 7.7% in the other cohort were eligible. There was a slightly higher percentage of JC Cohort 1 (LEP) students than the Judy Center Cohort 2 (12.3%). The variations between the two comparison groups on these indicators suggested that students of greater risk are indeed attending Judy Center programs before kindergarten.

In addition, in reviewing the total WSS[®] assessment for *all* Maryland kindergarten students, it was found that the readiness levels of students who qualified for and

Table 1. Demographic profile of kindergarten students in study

Student participants (<i>n</i> = 990)	Percent of all students	Percent who were Judy Center participants	Percent non-Judy Center participants
Sex			
Male	46.7	45.1	54.9
Female	53.5	46.9	53.1
Ethnicity			
Native American	4.1	51.4	48.6
Asian-American	4.8	48.8	51.2
African-American	31.3	54.5	45.6
White	42.7	35.2	64.8
Hispanic	17.1	57.8	42.2
Special education			
SPED	11.6	16.1	7.7
Non-SPED	88.4	83.9	92.3
Limited English proficiency			
LEP	13.1	14.9	12.3
Non-LEP	86.9	85.1	87.8
Free and reduced meals			
FARM	43.4	57.1	37.4
Non-FARM	56.7	42.9	62.6
All students	100.0	43.8	56.2

Source: Maryland Department of Education, 2003.

received LEP, SPED and FARM services were consistently lower than those of the rest of the student kindergarten population. An important objective of the Judy Centers is to provide the learning and developmental support necessary for students at risk to bridge the achievement gap. If students from these subgroups were able to overcome their disadvantages for academic achievement as a result of experiences and opportunities at the Judy Centers, the goals of the program were met. The analysis, therefore, examined the progress of these students, as well as the potential impact of having had prior Judy Center-type services both as preschoolers and as members of an at-risk group.

Data analysis

Across all seven domains, of the sample of 990 students 57% were initially assessed as attaining full readiness in the fall of 2002. In spring 2003, 92% of the cohort participating in Judy Center programs achieved readiness, and 91% of the other cohort achieved readiness.

Table 2 compares the fall 2002 and spring 2003 readiness level scores in three domains—language and literacy, mathematical thinking, and scientific thinking—for JC Cohort 1 and JC Cohort 2. The data show little difference between the two groups. Based on their fall composite scores, 56.5% of the children attending Judy Center programs were rated as fully ready, as compared with 57.4% of the cohort without any previous Judy Center services. By spring 2003, both groups (92.2% for Judy Center students and 91% for non-Judy Center students) had reached similarly high levels of readiness with only slightly more than nine out of 10 students in both groups being ready for first grade. However, as previously noted, JC 1 Cohort included proportionally more children from the high-risk categories of special education, limited English proficiency, and free and reduced meals than the number in JC Cohort 2.

To further examine how the two cohorts performed as kindergartners, the analysis compared the subgroups considered to be most at risk. Outcomes of fall and spring WSS[®] assessment results (percentage fully ready) for these three risk categories

Table 2. Comparison of readiness of both cohorts by WSS[®] developmental domains and composite scores

WSS [®] assessment domains	JC Cohort 1 (<i>n</i> = 434)		JC Cohort 2 (<i>n</i> = 556)	
	Fall 2002	Spring 2003	Fall 2002	Spring 2003
Language and Literacy	42.7	81.6	41.8	82.1
Mathematical Thinking	52.8	86.2	52.7	87.4
Scientific Thinking	30.8	83.3	29.4	81.6
Composite	56.5	92.2	57.4	91.0

Source: Maryland State Department of Education, 2003.

(SPED, LEP, and FARM) for the Judy Center kindergarten cohorts are presented in the tables that follow. Of the 624 students in the three at-risk (SPED, LEP, FARM) categories, 47% attained full readiness in the fall of 2002.

Table 3 shows that special education students were rated substantially lower than non-special education students on the fall WSS[®] assessment ratings; however, this gap closed considerably by the spring kindergarten assessment period. For example, the overall readiness rating on the fall assessment for students with disabilities who had attended Judy Center programs as pre-kindergartners is less than one-half (27%) of the entire group (50%). From fall 2002 to spring 2003, SPED students previously enrolled in Judy Center services had a larger percentage of students attaining readiness (88%) than those in the same at-risk categories who were in the non-Judy Center group (84%). There were also a larger percentage of non-special education students in JC Cohort 1 who attained full readiness (94%) than those in NJC Cohort 2 (92%). By the end of their kindergarten year, however, this at-risk subgroup had closed the gap to less than 4% (88% Judy Center SPED compared with 92% for all Judy Center students). The spring scores in Language and Literacy and in Scientific Thinking were significantly lower for JC Cohort 2 than for all JC students.

As represented in Table 4, for the students with limited English proficiency a larger percentage of students who had been Judy Center participants attained readiness (95%) than those who had not participated (85%) by spring 2003. Fall and spring percentages of those attaining readiness in Scientific Thinking were also greater for the LEP students from JC Cohort 1 (30% and 84%) than for JC Cohort 2 (15% and 67%). Gains for the JC Cohort 2 LEP students were significantly smaller compared with all JC students on the Composite WSS[®] scores.

Table 3. Kindergarten students receiving special education (SPED) services: percentage fully ready by WSS[®] composite scores, fall 2002 and spring 2003

Subgroup	N*	Composite		Language and Literacy		Mathematical Thinking		Scientific Thinking	
		Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Special education									
JC Cohort 1	65	26.6**	87.7	20.8**	74.6	29.6**	83.1	11.4**	73.1**
NJC Cohort 2	38	45.0	84.2	27.3**	71.4**	40.0	78.0	21.4	65.0**
Non-special Education									
JC Cohort 1	352	62.5	94.0	46.9	84.0	57.2	87.9	34.7	85.7
NJC Cohort 2	442	58.6	92.3	43.4	84.0	53.9	88.4	30.3	83.4
All JC students	990	57.0	91.5	42.2	82.0	52.8	86.9	30.0	82.8

Source: Maryland State Department of Education, 2003.

*The number of cases does not equal the all JC students total due to the omission of students not identified as a member of the at-risk subgroup. A total of 897 of the 990 kindergarten students were identified receiving or not receiving special education services.

**Is significantly smaller (at $p < .05$) than the corresponding percentage for all JC students.

Table 4. Kindergarten students with limited english proficiency (LEP): percentage fully ready by WSS[®] composite scores, fall 2002 and spring 2003

Subgroup	Composite			Language and Literacy		Mathematical Thinking		Scientific Thinking	
	N*	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
LEP									
JC Cohort 1	60	57.6	95.0	33.8	74.7	45.3	80.0	30.1	84.1
JC Cohort 2	58	34.3**	84.5**	23.3**	74.3	30.3**	74.7**	15.3**	66.7**
Non-LEP									
JC Cohort 1	357	56.2	92.7	44.4	84.1	54.3	88.5	30.9	83.7
JC Cohort 2	392	61.6	92.7	45.0	84.5	56.6	89.8	31.8	83.9
All JC students	990	57.0	91.5	42.2	82.0	52.8	86.9	30.0	82.8

Source: Maryland State Department of Education, 2003.

*The number of cases does not equal the all JC students total due to the omission of students not identified as a member of the at-risk subgroup. A total of 897 of the 990 kindergarten students were identified as having limited English proficiency or not having limited English proficiency.

**Is significantly smaller (at $p < .05$) than the corresponding percentage for all JC students.

A larger percentage of students who received free and reduced meals in kindergarten and Judy Center services achieved readiness (92%) than those not attending Judy Centers (87%). Table 5 presents the results of the FARM students. The spring score of 92% compares equally with the score of all JC students (92%). The JC Cohort 1 spring scores in Language and Literacy and Scientific Thinking were significantly less than the all Judy Center student group.

Results

Although a surface review of results of the Work Sampling System assessments of readiness in fall 2002 and spring 2003 showed little difference between kindergarten students who had prior Judy Center services and those who did not, further analysis suggests benefits for children in high-risk categories. In particular, preliminary results suggest that children who come from economically disadvantaged homes, children who have special needs and children with less proficient English skills who attended early quality and comprehensive programs such as the Judy Center program are able to reduce the achievement gap inherent in these populations. Any conclusion, however, on the long-term impact of the Judy Center services on the profile of achievement of these students is premature and will require continued study of their progress through schooling in years to come.

In summary, the Maryland Judith B. Hoyer Early Child Care and Education Enhancement Program has shown promising results in regard to school readiness and achievement. Based on evaluation data, families were able to access a broad range of

Table 5. Kindergarten students receiving free and reduced meals (FARM): percentage fully ready by WSS[®] composite scores, fall 2002 and spring 2003

Subgroup	Composite			Language and Literacy		Mathematical Thinking		Scientific Thinking	
	N*	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
FARM									
JC Cohort 1	217	52.8	91.7	36.7	80.8	46.7	85.3	31.0	81.5
JC Cohort 2	163	46.6	86.5	30.0*	74.7**	37.6**	81.1	28.0	73.7**
Non-FARM									
JC Cohort 1	186	62.3	95.2	50.7	85.3	61.1	90.2	31.6	87.4
JC Cohort 2	311	64.1	94.9	48.8	88.4	61.8	91.6	30.5	86.8
All JC students	990	57.0	91.5	42.2	82.0	52.8	86.9	30.0	82.3

Source: Maryland State Department of Education, 2003.

*The number of cases does not equal the all JC students total due to the omission of students not identified as a member of the at-risk subgroup. A total of 867 of the 990 kindergarten students were identified receiving free and reduced meals or not receiving free and reduced meals.

**Is significantly smaller (at $p < .05$) than the corresponding percentage for all JC students.

services, children were exposed to quality early care programs, and school readiness skills improved for students, particularly those in special education. On performance measures, kindergarten students who had received Judy Center services prior to and during their first year of school attained full readiness at the same level as all kindergarteners at the end of the year. Considerable gains were evident for students from three at-risk groups who were Judy Center participants.

A full-service program that focuses on the comprehensive needs of the family while providing quality childcare and early education experiences appears to be critical to school readiness for those children who may be at risk. Preliminary results from this study indicate that these students made significant gains in several school readiness skill areas after experiencing Judy Center services that implemented high-quality services for preschool children. Although preliminary results indicate positive results, continuing the study would enable an outcome evaluation to be conducted over a longer period of time. Extended research with this population could identify how early exposure to quality child care impacts children beyond kindergarten. Sustained school achievement could be tracked with the Judy Center and on Judy Center students.

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