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ABSTRACT

Helping families access affordable, quality child care has been the primary focus for the Orange County, North Carolina Smart Start Partnership for Young Children. This study investigated the effects of Smart Start efforts on children's skills at kindergarten entry. Kindergarten teachers rated the cognitive, language and social skills of 39 kindergartners who had attended child care in Orange County for at least 2 years at one of 12 child care centers participating intensely in Smart Start-funded quality improvement efforts. The teachers also rated the skills of 272 comparison children who had attended other child care programs or received no center-based child care. Findings indicated that children from low-income families who had attended Smart Start centers were rated significantly higher than were children from low-income families who had attended other centers. Children from middle-income families were rated significantly higher if they had attended any center-based child care before kindergarten compared to children who had not attended child care at all. Children in poverty were rated lower than children from non-poverty families. (Appendices contain copies of the evaluation instruments, examples of Smart Start activities, and demographic and other information from parent surveys.) (JPB)

P5

Smart START

The Effects of Smart Start Child Care on Kindergarten Entry Skills

FPG-UNC Smart Start Evaluation Team
June 1998

This report was written by Donna Bryant, Kathleen Bernier, Karen Taylor, and Kelly Maxwell. The study was the result of a collaboration between the Frank Porter Graham Child Development Center Smart Start Evaluation Team and the Orange County Partnership for Young Children. We would like to thank Michele Rivest, Jaya Egan, and Beth Bordeaux of OCPYC for their participation in the study design and recruitment of participants. All of us thank the child care directors, public school teachers, and children and families who participated in this evaluation.

For additional copies of this and other Smart Start evaluation reports, contact Marie Butts at the Frank Porter Graham Child Development Center, 105 Smith Level Road., CB #8180, Chapel Hill, NC 27599-8180 or call (919) 966-4295, or visit our web page at www.fpg.unc.edu/~smartstart

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Summary

In the early fall of 1998, kindergarten teachers rated the cognitive, language and social skills of 39 kindergartners who had attended child care in Orange County for at least 2 years at one of 12 child care centers participating intensely in Smart Start-funded quality improvement efforts. Orange County kindergarten teachers also rated the skills of 272 comparison children who attended child care programs or received no center-based child care. Children from low-income families who had attended Smart Start centers were rated significantly higher than were children from low-income families who had attended other centers. Children from middle-income families were rated significantly higher if they had attended *any* center-based child care before kindergarten compared to children who had not attended child care at all. Overall, children in poverty were rated lower than children from non-poverty families. The array of child care quality enhancements that Smart Start is providing in this North Carolina county is resulting in higher levels of skills among children from low-income families attending Smart Start participating centers. These children are more prepared for success as they begin kindergarten.

Introduction

North Carolina children attending center-based child care are significantly better prepared for kindergarten than children not attending child care, and Smart Start participation is improving the quality of child care. These two important findings, documented in previous reports from the Smart Start Evaluation Team at the Frank Porter Graham (FPG) Child Development Center, UNC-CH, suggest that preschoolers who attend a child care center participating in Smart Start-related child care quality improvement efforts should be better prepared for kindergarten. This study was specifically designed to measure the effects of Smart Start efforts in Orange County on children's skills at kindergarten entry. It was conducted by the FPG Smart Start Evaluation Team in collaboration with the Orange County Smart Start Partnership for Young Children (OCPYC). We implemented the study as a pilot test to determine how a partnership could identify and recruit individual children and their families for a study that would then be conducted by the FPG Evaluation Team. This study provided useful feedback about methodological procedures, but it also produced some significant findings which will be reported here.

Helping families access affordable, quality child care has been the primary focus for the Orange County Smart Start Partnership for Young Children since 1994. OCPYC has supported many projects such as child care scholarships, technical assistance and training programs, dental and vision screening projects, and outreach health education and services for children with special needs, all aimed at improving the overall quality of child care in Orange County. Research in early childhood education has demonstrated the importance of high quality early childhood education and care in preparing preschoolers for school success, the primary goal of Smart Start (see Bryant, Burchinal, Lau, & Sparling, 1994; Cost, Quality, & Outcomes Study, 1995; Howes, Phillips, & Whitebook, 1992; Lamb, 1997; NICHD Early Child Care Research Network, 1997). The purpose of this study was to determine if children who attended child care centers that

participated in multiple Smart Start efforts demonstrated higher levels of skills at kindergarten entry compared to other entering kindergartners.

It is important to understand the context of this study. The quality of child care in Orange County is better than the state average, when one looks at percent of child care facilities that are AA licensed and/or NAEYC-accredited compared with the percent of centers that are A licensed. Child care facilities that are AA licensed or NAEYC-accredited have met more stringent regulatory requirements, such as better staff-child ratios and a larger variety and quantity of educational activities. Our previous work has shown that North Carolina child care facilities with a higher licensure level provide higher quality care. Because 52% of child care facilities in Orange County are AA licensed and/or NAEYC-accredited (37% AA licensed and 15% both AA licensed and NAEYC-accredited) compared with state-wide figures showing 29% of regulated child care facilities with a AA license (Division of Child Development, May, 1998), we know that the quality of child care in Orange County is better than average in North Carolina.

Methods

Measures. The main measure of kindergarten "readiness" used in this study was the *Kindergarten Teacher Checklist (KTC),* a 36-item rating scale based on the Maryland Systematic Teacher Observation Instrument (see Appendix A). This instrument asks kindergarten teachers to rate the child's cognitive, language, social, and motor skills on a scale of 1 to 5 with a higher score indicating greater skills. The modified version used in this study also included questions about each child's sex and free or reduced lunch status (as a proxy for poverty).

Procedures for the Orange County Smart Start sample. OCPYC recruited families from 12 child care centers in the spring of 1997. The centers were selected based on the high level of Smart Start services they had received between 1995 and 1997. All child care centers in Orange County that had participated in multiple Smart Start efforts during the time period were eligible. Five of these Smart Start services or interventions are detailed in Appendix A. Other Smart Start efforts in Orange County

during this time period included facility improvement grants, CPR and first aid training for teachers, and a child care teacher substitute program. These OCPYC Smart Start programs represent a comprehensive package of quality enhancement efforts designed to improve aspects of the child care environment that have been shown to affect quality of care and children's school skills.

Letters describing the OCPYC Smart Start study were sent to selected center directors. OCPYC staff called the directors for agreement to participate and to help identify and recruit eligible families. Partnership staff then visited the directors at the centers to deliver family information packets and obtain preliminary demographic and other information about eligible children and their families. Families at the Smart Start centers were invited to be part of the study if their children would be entering kindergarten in the fall of 1997 and had attended the center for at least two years. Two years of previous attendance at the center was an important criterion to assure researchers that the Smart Start activities in which the centers participated had sufficient time to take effect and that the children had ample time to benefit from the improvements of the Smart Start programs. Center directors were asked to give a letter describing the study and a consent form to each eligible family. Directors at the 12 centers identified 112 potential children for the study. Families were asked to return the signed consent form to the director indicating whether they wanted to participate. Centers in which directors took an active role in identifying and recruiting families engaged many more families in the Smart Start study than centers in which directors did not play an active role.

Partnership staff sent multiple reminders via the directors to parents to ask them to complete and return the consent form and visited centers to meet parents face-to-face to ask for consent. It was difficult to recruit families over the summer and families with low income were especially difficult to contact (for example, Head Start centers do not provide summer care, so these parents could not be contacted). Parent consent to collect kindergarten information about their child was eventually obtained from 48 families (43% of those who received letters). Information about which school the child

was scheduled to enroll in kindergarten was recorded. To supplement data already collected from center directors, Partnership staff gathered demographic and other information from parents, either through a telephone interview or at the child care center. Demographic information from these parent surveys describing the families is presented in Appendix B.

During the fall of 1997, FPG staff contacted the schools and identified teachers of the OCPYC study kindergartners. We also used central office rosters to search for children who were not enrolled where expected. Forty of the 48 kindergartners whose parents had given consent (83%) were eventually located in 30 classrooms in 13 schools (2 children in schools in nearby counties other than Orange County). FPG staff hand-delivered packets to the teachers, each containing a letter describing the study and a data form to complete on the study child(ren) in their classrooms. FPG staff followed up with the kindergarten teachers multiple times – by telephone and in person – to collect as many KTC surveys on the OCPYC Smart Start sample as possible. A total of 39 KTC surveys out of 40 distributed (98%) were collected. Table 1 describes the characteristics of these OCPYC Smart Start child care children. (This sample will be referred to as the OCPYC SS child care sample.)

Table 1. Demographic characteristics of samples

	OCPYC Smart Start Sample (N=39)	General Orange County Sample (N=272)
Sex, % male	36	48
Poverty, %	29	23
Attended child care, %	100	87

Procedures for the comparison sample. During the fall of 1997, FPG also conducted a statewide study of kindergartners' skills. A random sample of 8,897 kindergartners in 55 NC counties were rated on the KTC by their kindergarten teachers who also provided information about children's sex, free or reduced lunch status, and

whether or not children had attended organized child care prior to kindergarten. As part of this statewide study, a random sample of 272 kindergartners was selected in Orange County. The demographic characteristics of this General Orange County sample are also shown in Table 1. (This sample will be referred to as the General Orange County sample.)

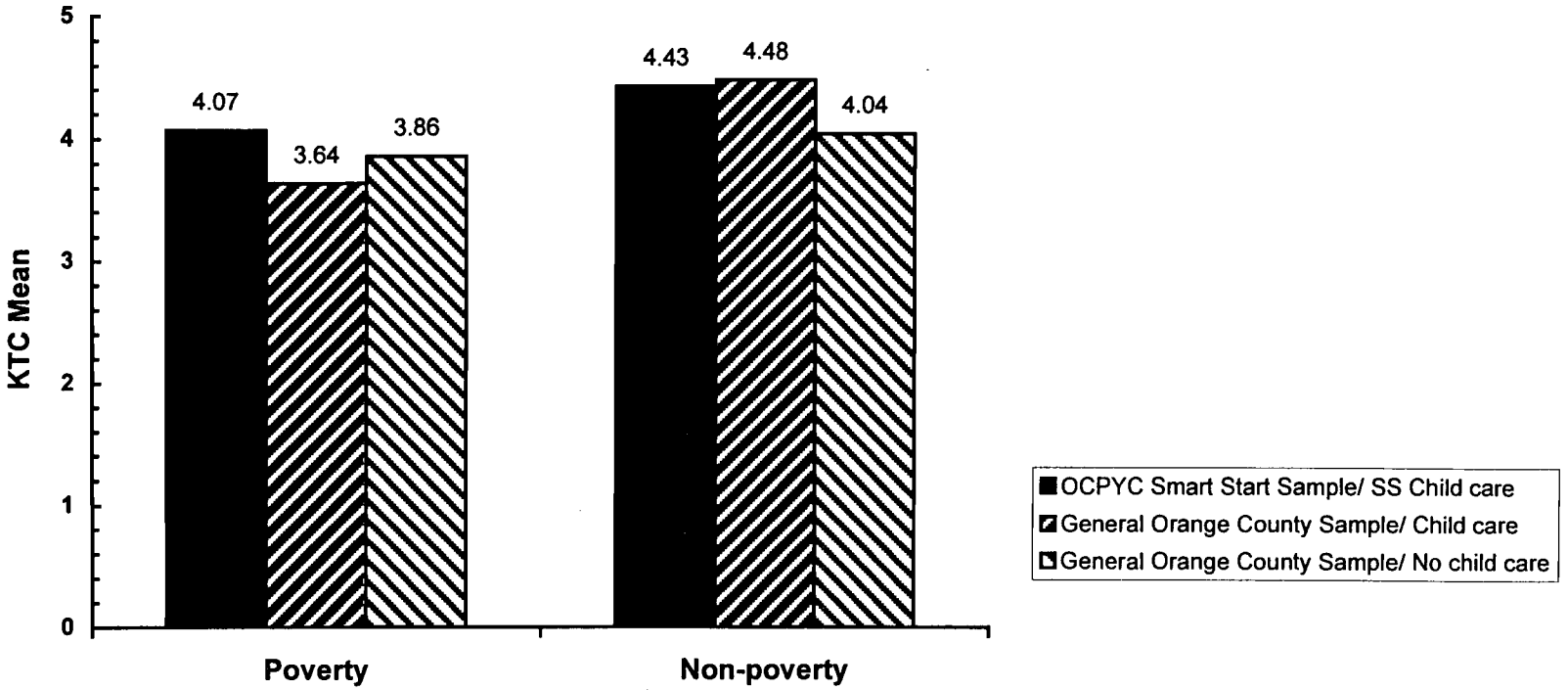
We did not have individual identifying information on these General Orange County children (as we did with the OCPYC Smart Start child care sample). For the children described by their kindergarten teachers as having attended organized child care prior to kindergarten, we could therefore not tell which child care center they had attended nor for how long. This means that some children in the General Orange County child care sample could also have been exposed to Smart Start efforts, either through attending an OCPYC Smart Start involved center or through other contacts with Smart Start funded programs in the county.

Results

Results are presented in Figure 1 and Table 2. The overall ANOVA of differences between groups was statistically significant, $F(5,201) = 16.90$, $p<.0001$. Mean KTC scores differed significantly between poverty and non-poverty children ($p < .0001$). Within the group of poverty children, those who attended child care centers involved in OCPYC Smart Start were rated as significantly more skilled than children who attended child care programs in the General Orange County sample ($p < .0133$). For non-poverty children, the mean KTC score was not significantly different for children who attended an OCPYC Smart Start child care center versus another center in the General Orange County sample. However, the difference between attending an OCPYC Smart Start child care center versus no center-based child care was statistically significant ($p < .0207$), as was the difference between attending any child care (OCPYC SS child care and General Orange County child care) versus no center-based child care ($p < .0045$), with better kindergarten skill scores for children who had been in child care.

Figure 1. Mean scores on *Kindergarten Teacher Checklist*

FPG-UNC Smart Start Evaluation



Children from low-income families who had attended Smart Start centers were rated significantly higher than were children from low-income families who had attended other centers. Children from middle-income families were rated significantly higher if they had attended any center based child care before kindergarten compared to children who had not attended child care at all. Overall, children in poverty were rated less highly than children from non-poverty families.

Table 2. Mean and standard deviation of children's scores on Kindergarten Teacher Checklist

	Poverty			Non-poverty		
	N	Mean	SD[a]	N	Mean	SD
OCPYC Smart Start Sample/ SS Child care	11	4.07	.78	27	4.43	.35
General Orange County Sample/ Child care	33	3.64	.65	152	4.48	.43
General Orange County Sample/ No child care	9	3.87	.58	18	4.04	.41

NOTE: Group effect: $F(5,201)=16.90$ $p<.0001$

[a]SD = standard deviation, a measure of variability in the data

Discussion

The results of this study about the effects of extensive Smart Start efforts to improve the quality of child care centers in Orange County show that Smart Start is helping young children come to school ready to succeed. We hypothesized that this would be true because previous research showed that the level of a center's participation in Smart Start was related to child care quality (The Effects of Smart Start on the Quality of Child Care, April, 1997) and that child care quality is related to children's academic and social outcomes (Bryant, Burchinal, Lau, & Sparling, 1994; Cost, Quality, & Outcomes Study, 1995; Howes, Phillips, & Whitebook, 1992; Lamb, 1997; NICHD Early Child Care Research Network, 1997). This study has provided direct evidence, which corroborates that these relationships hold true for the OCPYC Smart Start sample described in this report.

While kindergarten skills scores as indicated by teacher ratings on the KTC were overall quite high (no mean scores lower than 3.64 on a scale of 1 to 5), we saw differences among the skills' scores for children with different preschool experiences. The effect of Smart Start participation was more noticeable for poor children. Children who live in poverty were better prepared for kindergarten if they attended a child care center that received intensive Smart Start support rather than some other child care. Many studies have shown that poverty is a risk factor for school success and that a

child's ability at school entry can often predict long-term success, so it is critical that all children and especially poor children enter kindergarten ready to succeed. Smart Start-supported child care is helping poor children develop skills that prepare them for success in kindergarten.

In this study, the effects of Smart Start were not as obvious for children whose families were not in poverty. First, many of the children in the general Orange County comparison sample may well have attended child care centers participating in Smart Start, but we did not know it. We knew only that they had been enrolled in a center, but not which center. The children in the comparison sample may also be affected by other Smart Start benefits that we did not know about. Many child care centers and other service organizations in Orange County have been participating in Smart Start, although perhaps not at the high level required to be considered part of the OCPYC Smart Start sample of centers in this study. Children from non-poverty families may have received higher quality care at these centers or benefited from other Smart Start services. Second, the mean scores of both groups of non-poverty children (the general Orange County sample and the OCPYC Smart Start sample) were quite high, indicating that these children were exposed to a variety of experiences, whether at home or through their child care programs, that helped prepare them for school. Interaction with teachers and peers in a quality program may be an important factor in helping all children prepare for public school, and Smart Start is helping provide quality experiences for all young children.

The results of the non-poverty children in this study corroborate those found in our 1995 statewide kindergarten entry study, that is, non-poverty children who did not attend any center-based care before kindergarten were rated by their teachers as less prepared for school than children who had attended center-based care. Positive center-based preschool experiences seem to help children be more prepared to succeed in school.

The main limitation of this study is that the general Orange County sample of kindergartners likely included some children who attended child care in centers that

significantly participated in Orange County Smart Start activities. Comparisons between the general Orange County sample and the selected Smart Start-involved sample are conservative. That is, the effects of Smart Start may be even greater than what we found in this pilot study. If we could identify the children in the general Orange County sample who attended Smart Start involved centers (and remove them from the analysis), we would have a truer test of the difference between attending a Smart Start-involved center compared to a non-involved center. In short, the results of this study probably under-estimate rather than over-estimate the benefits children derive from attending a child care center that is participating in intensive Smart Start quality improvement initiatives.

We conducted this study with our Orange County partners essentially as a pilot test to see if these procedures of collaborating with counties to recruit samples of Smart Start participants would work. Our main goal was to develop procedures that could be replicated to recruit other NC Smart Start partnerships to join with us in similar efforts. With the small sample size obtained in this pilot study, we are somewhat surprised that group differences were observed. To confirm these findings, the evaluation team has recruited other partnerships to participate in a similar study in 1998-99, to obtain comparable data over a wider range of economic and geographic circumstances throughout NC.

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APPENDIX A

Instruments

1. *Kindergarten Teacher Checklist (KTC),* 36-item rating scale based on the Maryland Systematic Teacher Observation Instrument.
2. Orange County Partnership for Young Children (OCPYC) parent survey

Smart Start

Kindergarten Teacher Checklist

(based on the Maryland Systematic Teacher Observation Instrument)

DO NOT BEND

Sex of child F M

Child's date of birth m m / d d / y y

GENERAL PURPOSE DATA SHEET II
form no. 70921

USE NO 2 PENCIL ONLY

NEVER — 1

SELDOM — 2

SOMETIMES — C

OFTEN — B

ALWAYS — A

1. Can copy a circle, square, and triangle so that it is recognizable.
2. Gets along with other children in various situations.
3. Can tell about a picture while looking at it.
4. Names and locates at least five parts of his body.
5. Knocks over things when reaching for them.
6. Can repeat sentences such as "I like to play outside" in correct order.
7. Cringes or pulls away when approached by others.
8. Can recognize own name in print.
9. Stays with the activity at hand.
10. Can tell about a recent school activity (e.g., field trip).
11. Follows directions.
12. Fumbles for words, uses a wrong word, or says s/he forgot what s/he was trying to say.
13. Drowsy, sleepy, or sleeps.
14. Names common objects such as chair, desk, table.
15. Fights, shouts, or shakes his/her fist as a preferred means of solving problems.
16. Identifies likenesses and differences in pictures, objects and forms.
17. Gives own name and age when asked.
18. Stares into space.
19. Can identify colors (i.e., red, yellow, blue, green) by name.
20. Says, "I can't" when presented with school tasks.
21. If child prints, s/he prints words, letters, and/or numbers backwards.
22. Hurts children and/or animals for no apparent reason.
23. Speech is understandable.
24. Works and solves problems independently.
25. Destroys or damages things, breaks toys.
26. Matches objects to pictures (e.g., toy truck to picture of truck).
27. Finishes tasks late.
28. Can tell about a story after listening to it.
29. Stumbles, trips, or falls.
30. Says "huh" or "what" after s/he has been told something or asked a question.
31. Can tell how many objects up to five.
32. Classifies objects by categories, such as food or clothing.
33. Speaks in sentences of more than three words.
34. Discriminates between fine differences in sounds heard (e.g., boy, toy).
35. Arranges a three-part picture story in correct sequence.
36. Retells story in correct sequential order.
37. Do you think this child qualifies for free or reduced price lunch? (A=Yes, B=No)
38. Does this child have any disabilities? (A=Yes, B=No)
39. Has this child been retained in kindergarten? (A=Yes, B=No)
40. Did the child attend organized child care before beginning kindergarten? (A=Yes, B=No, C=Don't Know)

Orange County Partnership for Young Children

Orange County School Readiness Project

Demographic Survey

The Orange County Partnership for Young Children is conducting an evaluation project in cooperation with the Frank Porter Graham Child Development Center to assess the **"school readiness"** of a sample of young children in child care centers in Orange County who are entering kindergarten in the Fall of 1997.

Children will be identified who are entering kindergarten and have been exposed to multiple Smart Start efforts in their child care center for at least two years. ***The names of child care centers and children will be kept confidential and will not be associated with study findings.*** (The following information was obtained from directors of participating child care centers and parents of study children).

1. **Name of child:** _____
2. **Child's date of birth:** _____
3. **Initial enrollment date:** _____
4. **Name of elementary school child will likely attend:** _____
5. **Child's <u>previous</u> child care experience:**

   None ☐

   Unknown ☐

   Name of Center(s): _____

   Name of Family Day Care Home(s): _____

   At home with parent or relative Yes ____ No ____

   Baby-sitter (at home or baby-sitter's) Yes ____ No ____

6. **Parent or guardian's name:** _____
7. **Phone number:** _____
8. **Address:** _____

   _____

   _____

9. **Residential area:**
   - North Orange County ☐
   - Chapel Hill ☐
   - Carrboro ☐
   - Hillsborough ☐
   - Other location _____

10. **Child's race/ethnicity:**
    - Caucasian ☐
    - African-American ☐
    - Hispanic/Latino ☐
    - Asian ☐
    - Other _____

11. **Chronic health problems** *(If yes, please list)*: Yes ☐ No ☐

_____

_____

12. **Other identified special needs** *(If yes, please list)*: Yes ☐ No ☐

_____

_____

13. **Family structure** *(according to head of household)*:

Single parent (under 18)	☐
Single parent (over 18)	☐
Both parents (under 18)	☐
Both parents (over 18)	☐
Grandparents	☐
Foster parents	☐
Other guardian	☐

14. **Family size** *(total number of families members living in the home)*:

2 persons	☐
3 "	☐
4 "	☐
5 "	☐
More than 5	☐

15. **Receiving child care subsidy:** Yes ☐ No ☐
(If yes, please check the box that indicates which agency provides subsidy):
DCSA ☐ DSS ☐

That is all the demographic data that was collected from your child's center.

Would you mind if I ask 3 more questions about you, the parent? You may choose not to answer any particular question by just telling me. Yes ☐ No ☐

1. **What is the income range for your family?** *(total family income)*:

Below 10,000	☐
10,000 - 15,000	☐
15,000 - 20,000	☐
20,000 - 25,000	☐
25,000 - 30,000	☐
30,000 - 35,000	☐
35,000 - 40,000	☐
Above 40,000	☐

2. **What is your birth date?** _____

3. **What is the highest grade level that you have completed?** _____

The last 3 questions are about your child's experience in child care and the services he/she has received outside the child care center.

1. **What type of health screening or other services has your child received in the community?**

2. **Do you have any suggestions about how your child could have had a better experience in child care?**

3. **Other comments:**

Thank you for your time, and thank you again for your help and participation in this project.

If you think of any questions that you have about the project or the Partnership, please give me a call.

APPENDIX B

Examples Of Orange County Partnership For Young Children Smart Start Funded Quality Improvement Activities

Orange County Partnership for Young Children

Program Initiatives

★ **Project Child Care Upgrade, Day Care Services Association**
Continues Project Child Care Upgrade which is designed to improve the quality of early care and education inchild care centers and family day care homes in Orange County through technical assistance, training, and incentives for indoor and outdoor facility improvements.

★ **W.A.G.E.$ Project, Day Care Services Association**
Continues the Child Care W.A.G.E.$ project which provides salary supplements to child care teachers, directors, and family child care providers who have some kind of educational credential beyond high school and who maintain continuous employment in their current child care program. The goal of this project is to reduce turnover and increase the education of the early childhood workforce in Orange County. A new recruitment feature is a signing bonus to address the high vacancy rate of teachers currently.

★ **Scholarship Program, Day Care Services Association**
Renews the continuation for the Scholarship Program which provides funding to help with the child care tuition costs for parents who need child care to work, look for work or attend school. Higher scholarship rates are provided for child care programs operating at higher quality standards. DCSA will assume responsibility for enhanced payment rates for DSS families and transportation reimbursement.

★ **Child Care Administration and Social Work, Department of Social Services**
Continues administrative and social work support for the child care subsidy unit of the Department of Social Services in order to improve and streamline in-house services and provide comprehensive support to families, as well as to ensure coordination with the scholarship program operated by Day Care Services Association.

★ **Child Care SHAPE Up, Piedmont Health Services**
Provides continued support for the Child Care S.H.A.P.E. Up Project which seeks to prevent childhood illnesses and injuries in 13 homes and child care centers through technical assistance, training, and consultation.

APPENDIX C

Orange County Partnership For Young Children Smart Start Sample: Demographic And Other Information From Parent Surveys

Table 3. Family structure

Table 4. Family size (total number of family members living in the home)

Table 5. Family annual income

Table 6. Number of families receiving child care subsidy and source of subsidy

Table 7. Caretaker's (mother's, if available) highest grade completed in school

Table 8. Type or types of child care child attended prior to attending Orange County Smart Start child care center

Table 3. Family structure

	N (n=33)	Percent
Two parents, both over 18 years	22	66.7
One parent, over 18 years	9	27.3
One parent, under 18 years	1	3.0
Grandparent	1	3.0

Table 4. Family size (total number of family members living in the home)

	N (n=33)	Percent
2 persons	6	18.2
3 persons	8	24.2
4 persons	9	27.3
5 persons	5	15.1
6 or more persons	5	15.1

Table 5. Family annual income

	N (n=32)	Percent
Below $10,000	4	12.5
$10,000 – 15,000	1	3.4
$15,000 – 20,000	2	6.5
$20,000 – 25,000	3	9.5
$25,000 – 30,000	2	6.5
$30,000 – 35,000	1	3.4
$35,000 – 40,000	2	6.5
Above $40,000	17	51.9

Table 6. Number of families receiving child care subsidy and source of subsidy

	N (n=13)	Percent
Orange County Day Care Services Association (DCSA) subsidy	6	46.2
Department of Social Services (DSS) subsidy	7	53.8

Table 7. Caretaker's (mother's, if available) highest grade completed in school

	N (n=32)	Percent
10th	1	3.1
11th	1	3.1
12th	4	12.5
13th	1	3.1
14th	2	6.3
15th	1	3.1
16th	6	18.8
18th	10	31.3
19th	3	9.4
20th	3	9.4

Table 8. Type (or types) of child care children attended prior to attending Orange County Smart Start child care center (Some children participated in more than on type of care prior to attending Orange County SS center.)

	N (n=33)	Percent (of children)
Another child care center	12	36.4
Family child care home	12	36.4
Babysitter	4	12.1
Care by parent or relative	19	57.6

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