

Early Child Care and Children's Development in the Primary Grades:
Follow-Up Results from the NICHD Study of Early Child Care

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SLIDE 1: TITLE

Today I will be presenting the latest installment of findings from the NICHD Study of Early Child Care and Youth Development. The co-authors of today's presentation can be seen on this first slide.

SLIDE 2: NETWORK MEMBERS

We are presenting on behalf of the NICHD Early Child Care Research Network whose names can be seen on this slide.

SLIDE 3: QUESTIONS SPARKED BY SEVERAL FACTORS

Questions about long-term effects of early child care are of great interest to parents, educators, and policy makers as well as developmentalists. These questions have been raised in part because of the large numbers of children who are in child care and in part because there is a lack of agreement about the impact of these experiences. Understanding the conditions under which early child care is associated with children's functioning has been a primary aim of the NICHD Study of Early Child Care since its inception in the early 1990s.

SLIDE 4: PREVIOUS SECCYD FINDINGS

In a series of earlier presentations and publications, we have reported that three aspects of early child care—quality, quantity, and type—were related to children’s functioning just prior to kindergarten. Higher quality child care was associated with higher pre-academic skills and language performance. More hours in care predicted higher levels of behavior problems. More experience in center-type care was linked to better language skills and performance on a memory task, but also more problem behaviors.

The purpose of the current report is to extend our previous work to ask if effects of child care are evident through the primary grades.

SLIDE 5: FOUR POSSIBILITIES

We considered four possibilities: that effects are carried forward, that they serve as a spring board. A third possibility is that early effects have dissipated or disappeared by grade 3. A fourth possibility is that new effects emerge during the primary grades

SLIDE 6: ALTERNATIVE EXPLANATIONS.

In all nonexperimental studies of child care, selection bias is a concern. Consequently, in the current study, effects associated with early child care were tested after controlling for an extensive array of family factors and using growth curve analyses in which the child served as his or her own control.

A related concern is that effects may be explained by unmeasured or omitted variables. In the case of school-aged children, concurrent experiences at home, school, or after school may account for developmental trajectories during the primary grades, rather than the children’s earlier child-care histories. Consequently, in the current study, concurrent measures parenting, of the quality of classroom instruction in the primary grades, and of the amount of out-of-school care in the primary grades were included as covariates

SLIDE 7: SAMPLE RECRUITMENT

Families were recruited during hospital visits with mothers shortly after the birth of a child in 1991 at 10 sites in the U.S. During selected 24-hour intervals, all women giving birth were screened for eligibility. From that group, 1364 families completed a home interview when the infant was 1 month old and became the study participants.

SLIDE 8: SAMPLE DEMOGRAPHICS

The analysis sample for the current study consisted of 872 children. Children were included in these analyses if they had outcome measures collected between 4½ years and Grade 3 and if early child-care quality, hours, and type had been assessed. The sample was balanced in terms of child gender. 18% were poor or near poor. 26% of the mothers had a high school degree or less. 20% of the sample were children of color.

SLIDE 9: OVERVIEW OF DATA COLLECTION

Major assessments were conducted in the home, child care, school, and laboratory settings. These assessments occurred from infancy through Grade 3. They included naturalistic observations in the home, child care, and school settings; semi-structured assessments that were videotaped and scored at a central location; standardized tests of language, cognition, and academic achievement; maternal reports and teacher reports of child functioning.

SLIDE 10: CHILD CARE MEASURES

Nonmaternal child care was defined as regular care by anyone other than the mother—including care by fathers, relatives, and nannies (whether in home or out of home), family daycare providers, and centers—that was routinely scheduled each week.

Mothers reported the study children's hours of routine nonmaternal care during the phone and personal interviews conducted at 3 to 4 -month intervals (called epochs). The *hours* spent in

all settings were summed for each of the 16 epochs and parameterized on an hours-per-week basis.

For each epoch, the child's primary care arrangement was classified as center, child-care home, in-home care, grandparent care, or father care. The proportion of epochs in which the child received care in a center and the proportion of epochs in a child-care home were included as *type of care* predictors in analyses.

Quality was defined by the caregiver-child interaction and stimulation. Observational assessments were conducted during 2 half-day visits to the primary child-care arrangement at ages 6, 15, 24, and 36 months and one half day visit at 54 months

SLIDE 11: CHILD AND FAMILY COVARIATES COLLECTED IN INFANCY AND EARLY CHILDHOOD

Information about child *race, ethnicity, and gender, maternal education, household structure, family income, maternal depressive symptoms, and observed parenting quality* was collected in infancy and early childhood and was used as control variables.

SLIDE 12: MEASURES COLLECTED IN THE PRIMARY GRADES

Measures of family demographic and psychological characteristics also were obtained when children were in kindergarten and first, second, and third grades. These factors included *household structure, family income, maternal depressive symptoms, and observed parenting quality*. Children's experiences in their first grade and third grade classrooms also were observed. These observations focused on the overall classroom organization as well as the specific study child and his or her classroom experiences.

Mothers were interviewed by telephone twice each year about the study children's out-of-school care and total hours were determined.

SLIDE 13: CHILD DEVELOPMENTAL OUTCOMES

Cognitive and social outcomes were assessed longitudinally from 54 months through the spring of third grade. With respect to cognitive-academic achievement, children were administered four subtests from the Woodcock-Johnson Psycho-Educational Battery: *Letter-Word Identification*, *Applied Problems*, *Memory for Sentences*, *Picture Vocabulary*,

Mothers and teachers completed the Social Skills Questionnaire from the Social Skills Rating System and the Child Behavior Checklist. Teachers completed the short form of the Student-Teacher Relationship Scale and mothers completed a parallel form at 54 months, kindergarten, first grade, and third grade.

Teachers completed a mock report card when children were in kindergarten, first, second, and third grades. This questionnaire includes six items addressing the child's *work habits*.

SLIDE 14: FIVE CHILD CARE PARAMETERS

Growth curve analyses were used to create three child-care parameters: the child-care quality intercept, the hours/week intercept, and the hours/week slope. In addition we determined the proportion of epochs in which center-based child care was used for at least 10 hours per week, and proportion of epochs in a child-care home was used for at least 10 hours per week.

SLIDE 15: ANALYTIC STRATEGY

Our primary data analyses tested the long-term associations between child-care experiences during the first 4.5 years and children's academic and social development from 4.5 years through the spring of the third grade. Longitudinal analyses were conducted using hierarchical linear models that were fitted to estimate individual and group growth curves. The developmental outcome trajectories were centered at spring of first grade, that is, the main effect coefficient for the tested child-care parameters indicates if a predictor was related to an outcome

in the spring of first grade.

In addition, interactions with age were tested. The absence of an interaction between a child-care variable and child age indicates that the main effect of the child-care predictor on the outcome in question was comparable from 54 months to Grade 3. When interactions with age were detected, we tested whether the association between that child-care predictor and the child developmental outcome was significant at the endpoint, namely, at third grade.

SLIDE 16: DOES EARLY CHILD CARE PREDICT CHILD OUTCOME TRAJECTORIES WHEN OTHER EARLY EXPERIENCES ARE CONTROLLED?

Three models were tested. In the first model, we controlled for site, and early child and family factors. The second model added concurrent family, school, and after-school covariates to the covariates in the initial analyses. A third set of models tested the interaction terms.

Results were so similar across the two models that only results from the analyses that included both early childhood and concurrent covariates are reported. No significant interactions were not detected, so the interaction analyses will not be discussed

SLIDE 17 DOES EARLY CHILD CARE PREDICT CHILD OUTCOME TRAJECTORIES WHEN TIME VARYING CONCURRENT FAMILY FACTORS ARE CONTROLLED?

List of primary grade covariates

SLIDE 18 EFFECTS ASSOCIATED WITH CHILD CARE QUALITY

Shown in this slide are effects associated with child care quality. The first row (labeled “CC Quality”) presents the estimated child quality coefficient, and reflects the extent to which quality is associated with the outcome in first grade. The second row (labeled “Quality x Age”) lists the estimated quality x age coefficient, and reflects the extent to which the association

between quality and outcomes changes linearly over time.

As shown, children who had experienced higher quality child care displayed higher math (Applied Problems), vocabulary (Picture Vocabulary), and memory (Memory for Sentences) skills than children who had experienced lower quality care. These main effects of child-care quality remained relatively consistent from 54 months through third grade; no significant age x child-care quality interactions were detected.

Child-care quality was not related to mother or teacher reports of social functioning.

SLIDE 19 EFFECT SIZES ASSOCIATED WITH CHILD CARE QUALITY

The associations between child-care quality and later academic achievement were modest as the effect sizes (ranging from .07 to .09) demonstrate.

SLIDE 20 EFFECTS ASSOCIATED WITH AMOUNT OR QUANTITY OF CHILD CARE

The next slide shows the coefficients and effect sizes associated with child-care hours. Teachers rated children with more hours of child care as having more externalizing behaviors, fewer social skills, more conflict with the teacher, and less adaptive work habits. For two of these outcomes, externalizing behaviors and teacher-conflict, the magnitude of the association between the child-care hours intercept and child functioning declined over time, as revealed by a significant interaction between age and child-care hours. At the last assessment age—third grade—child-care hours was no longer significantly related to teacher ratings of externalizing behaviors or conflict.

SLIDE 21 EFFECT SIZES ASSOCIATED WITH QUANTITY

Effect sizes tended to be modest (ranging from .01 to .12).

SLIDE 22 EFFECTS ASSOCIATED WITH TYPE OF CHILD CARE

As shown in the next slide, children who spent more epochs in center-type care obtained higher scores on the memory test. In addition, children who experienced more epochs in center care were reported to have more conflictual relationships with their mothers and their teachers and to have more externalizing behavior problems according to the teacher. The association between time in center care and teacher report of conflict changed reliably over time, as evidenced in the significant center x age interaction. By third grade, proportion of time in center care was not statistically related to teacher ratings of conflict.

SLIDE 23 EFFECT SIZES

Again, these effects appeared modest and consistent over time for three of these four outcomes, with effect sizes ranging from .01 to .13.

SLIDE 24 EFFECTS ASSOCIATED WITH CHILD CARE HOMES

The next set of findings pertains to proportion of time in child-care homes. Children who spent more time in child-care homes were reported to have more conflictual relationships with their teachers than children who spent less time in child-care homes. This association did not change reliably over time. In addition, a significant child-care home by age interaction was obtained for teacher reported social-emotional skills. Teachers rated children who spent more time in child-care homes as showing increases in social-emotional skills over time relative to children who spent less time in child-care homes.

SLIDE 25 EFFECT SIZES**SLIDE 26 CONCLUSIONS**

How do the results of the current follow up of through third grade accord with our earlier findings? Some of the advantages and some of the disadvantages associated with early child

care carried forward or were maintained through Grade 3. The advantage is that higher quality child care predicts better academic achievement, as revealed by standardized achievement test scores through third grade, and that more exposure to center-based care is associated with enhanced memory. The disadvantage is that more hours in child care across the first 4 ½ years of life is linked to lower teacher-rated social skills through third grade and that more experience in center-based care is related to more mother-child conflict and teacher-rated externalizing problems. Some new effects were detected: work habits. And other effects, such as relations between child care hours and behavior problems, declined during the primary grades. It remains to be determined if these relations with early child care remain, dissipate, or grow in early adolescence, a critical transition period for many children. Because schooling is cumulative in nature with individual attainment increasingly stable with time, it will be important to determine if the observed academic advantages bring greater advancement over time and if the initial disadvantages in the socio-emotional domain are difficult to reverse. It also remains to be seen if some effects such as those between child care hours and behavior problems re-appear as the study children move into early adolescence.

SLIDE 27 NEXT STEPS