

Head Start Impact Study Design and Findings and 3rd Grade Follow-up Plans

Advisory Committee
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Administration for Children and Families or the U.S. Department
of Health and Human Services

Today's Presentation

- ▶ Study background and design
- ▶ Results through the end of 1st grade
- ▶ Where we're headed – report through the end of 3rd grade

Study Team

- ▶ Implemented by:
 - Westat
 - Subcontractors
 - Chesapeake Research Associates
 - Ronna Cook Associates
 - Abt Associates
 - University of Virginia
 - American Institutes for Research
 - Urban Institute
 - Decision Information Resources

Background of Study

- ▶ Mandated by Congress in the 1998 reauthorization of Head Start.
- ▶ Congress asked that the study be:
 - nationally representative, and
 - a comparison of Head Start children with a group of comparable non-participants.

Research Questions

- ▶ What difference does Head Start make to key outcomes of development and learning (and in particular, the multiple domains of school readiness) for low-income children?
- ▶ What difference does Head Start make to parental practices that contribute to children's school readiness?
- ▶ Under what circumstances does Head Start achieve the greatest impact? What works for which children?

Study Sample

- ▶ Nationally representative sample, with the exception of American Indian/Alaska Natives, migrant and “special population” programs
- ▶ 84 randomly selected grantees across 23 states
- ▶ 383 randomly selected centers
- ▶ Total of 4,667 randomly assigned children in two cohorts: 2,559 3-year-olds and 2,108 4-year-olds

Study Sample (cont.)

- ▶ Approximately 15 percent of children served by Head Start nationally were not represented in the study.
- ▶ This was due to the decision to only include children from Head Start programs where there were fewer slots available than children applying.

Response Rates

- ▶ Response rates hover around 75 to 80 percent throughout the study, with slight variation by year and instrument.
 - Example: Response rate for the 1st grade child assessment

Age cohort	Head Start Group	Control Group
3-year-olds	81%	74%
4-year-olds	79%	73%

Study Timeframe

- ▶ Results reported to date:
 - Baseline data collected in fall 2002.
 - Annual spring follow-up data collected through the end of 1st grade (Spring 2006 for the youngest children).
- ▶ Have also collected data through the end of the 3rd grade – will be used for the 3rd grade report.

Randomization

- ▶ Newly entering 3–and 4–year old Head Start applicants were randomly assigned to either:
 - **Treatment group** to enroll in Head Start, or
 - **Control group** that did not; parents found other available services for their child or the child was cared for at home.
- ▶ For the 3–year–olds, the control group had access to Head Start in second year.
- ▶ For both age cohorts, this study assesses the impact of one program year of Head Start.

Outcome Domains

- ▶ Child Outcomes
 - Cognitive
 - Social–Emotional
 - Health
- ▶ Parenting Practices

Data Sources

- ▶ All Years: Children, Parents /primary caregivers
- ▶ Preschool: Care providers, Center directors, Teachers, Observations
- ▶ School Years: Teachers, Principals (3rd grade data collection only), secondary information on schools

Measures

▶ Cognitive

- Subscales of the WJ-III related to language, literacy, and math (Spanish version for letter-word identification)
- PPVT and TVIP
- CTOPPP

▶ Social-Emotional

- Adjustment Scales for Preschool Intervention
- Parent-Child Relationship Scale
- FACES measures on behavior, social competencies, approaches to learning

Measures (cont.)

▶ Health

- Parental reports of health and health care

▶ Parenting Practices

- Parental reports of parenting activities and approaches

▶ Preschool

- Center environment and characteristics
- Teacher qualifications and training
- Classroom environment and activities
 - ECERS-R

Measures (cont.)

- Arnett
- Child staff ratio
- Literacy/math activities
- ▶ **Elementary School**
 - School characteristics
 - Teacher qualifications
 - Classroom characteristics and instructional activities

Impacts

- ▶ Regression-adjusted treatment-control group differences, using weighted data
- ▶ Calculated both Intent to Treat (ITT) estimates and Treatment on the Treated (TOT) estimates
- ▶ To address multiple comparisons, three levels of evidence are reported:
 - Strong evidence – $p < .05$ and holds up under adjustment for multiple comparisons
 - Moderate evidence – $p \leq .05$ but does not hold up under adjustment for multiple comparisons
 - Suggestive evidence – $p \leq .10$

This Study is Unique

- ▶ This study:
 - Examines an ongoing established program
 - In a nationally representative sample
 - Using a randomized control trial (RCT) design that follows children longitudinally through the end of 3rd grade

This Study is Unique (cont.)

- ▶ Not directly comparable to other studies of early childhood care and education
 - Randomized control trial
 - Representative sample of children and programs
 - Examination of a comprehensive set of outcomes over time
 - Control group children did not all stay at home
 - Impacts represent the effects of one program year

Key Impact Findings

Experiences of the Program and Control Groups

- ▶ Randomization affected what types of early childhood settings children entered.
- ▶ For both 3- and 4-year-olds:
 - Control group (non-Head Start) children were about five times more likely to be exclusively in parent care.
 - Head Start children were about twice as likely to use a center-based program (including Head Start).
 - Still, about 60% of children in the control group were in some form of non-parental care at least five hours a week.

Early Care Experiences (cont.)

- ▶ Average length of participation in Head Start in that first year was about 8 months.
- ▶ Average number of hours in non-parental care:
 - 3-year-olds: 28 hours for Head Start group, 33 hours for control group
 - 4-year-olds: 25 hours for Head Start group, 29 hours for control group.

Early Care Experiences (cont.)

- ▶ Providing access to Head Start had a positive impact on the quality of children's early care in that first year.
- ▶ Differences in:
 - teacher qualifications
 - classroom literacy and math activities
 - teacher-child ratios
 - teacher-child interactions (Arnett) and global quality (ECERS-R and FDCRS)

Early Care Experiences (cont.)

- ▶ Some of this difference is driven by the fact that 40 percent of the control group was in parental care.
- ▶ By the second year, the care experiences did not vary much for the 3-year-old cohort:
 - 50 percent of the control group and 63 percent of the Head Start group were enrolled in Head Start
 - Quality of care was similar
- ▶ Minimal differences in kindergarten and 1st grade experiences for the Head Start and control groups.

Cognitive Impacts

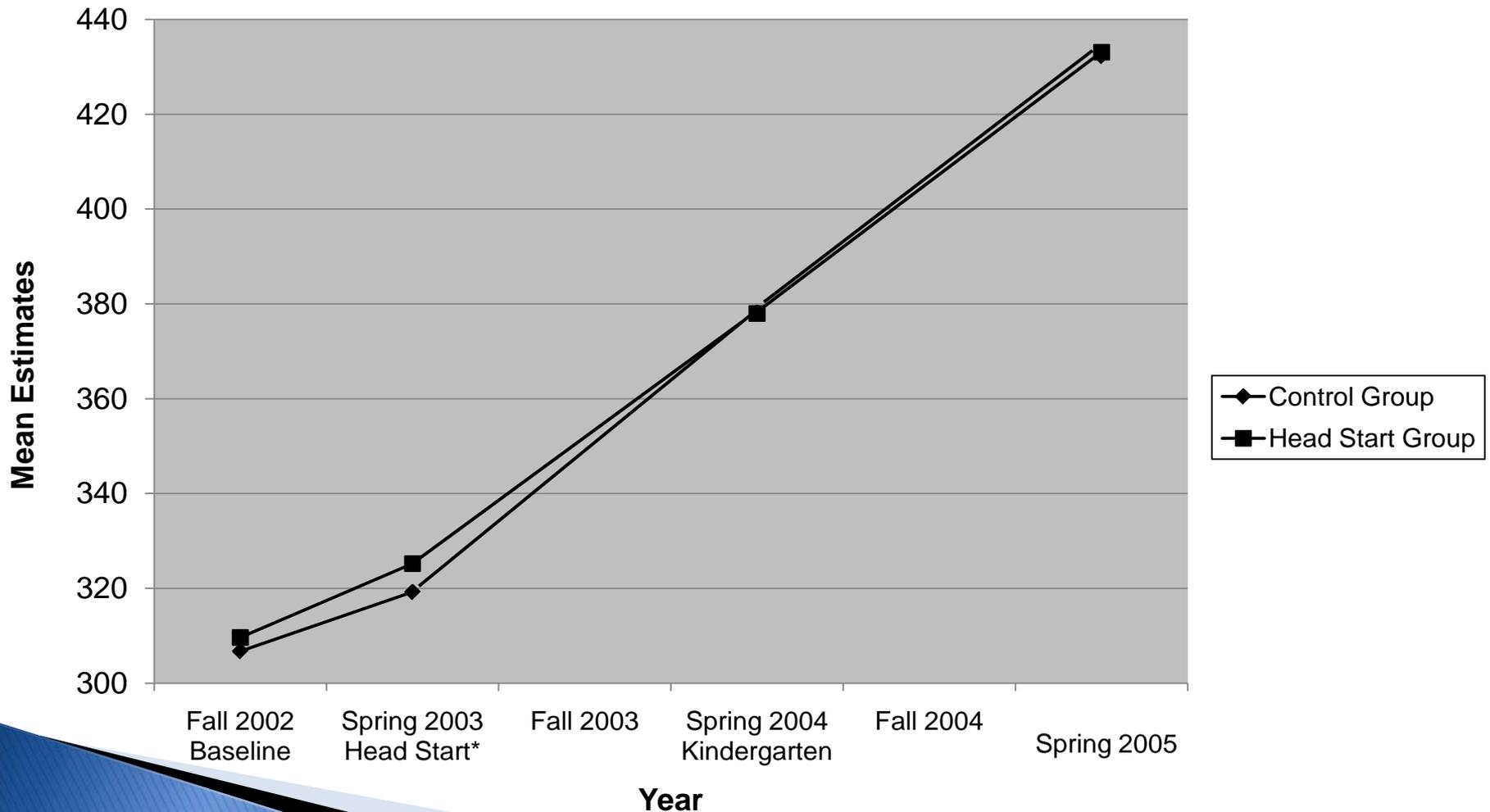
- ▶ For both age cohorts, Head Start had a statistically significant impact on children's language and literacy development while children were enrolled in Head Start.
 - Strong evidence of positive impacts, particularly in vocabulary and pre-literacy skills (assessments and parent report)
 - Pre-writing impacts for the 4-year-old cohort and math impacts for the 3-year-old cohort

Cognitive Impacts (cont.)

- ▶ By the end of 1st grade, the Head Start children and the control group children were at the same level on many of the cognitive measures.
 - Few statistically significant impacts in 1st grade
 - Suggestive evidence ($p < .10$) of impacts on vocabulary for the 4-year-old cohort and oral comprehension for the 3-year-old cohort

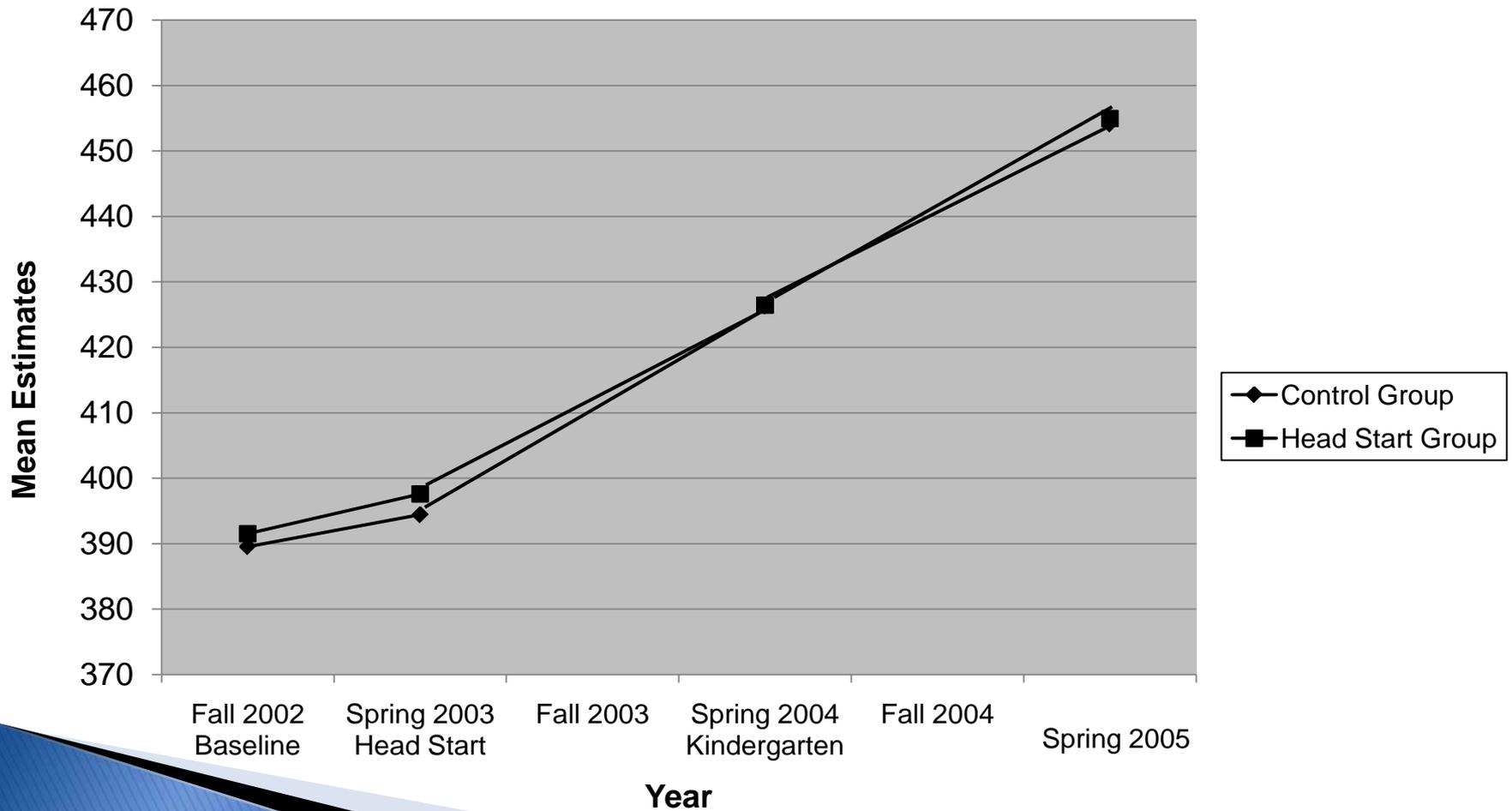
Estimated Annual Impacts by Year for the 4-Year-Old Cohort: Letter-Word Identification

WJ-III Letter-Word Identification



Estimated Annual Impacts by Year for the 4-Year-Old Cohort: Applied Problems

WJ-III Applied Problems



Social-Emotional Domain

- ▶ No clear benefits for the 4-year-old cohort
- ▶ 3-year-old cohort showed favorable impacts in all years
 - Head Start year: less hyperactive and problem behavior
 - Age 4 year: better social skills and positive approaches to learning
 - Kindergarten year: less hyperactive behavior, and better social skills and approaches to learning
 - 1st grade year: closeness and positive relationships with parents

Health Domain

- ▶ **Dental care:** Strong evidence of increases during the Head Start years for both age cohorts (continues into second year for the 3-year-old cohort).
- ▶ **Health insurance:** Moderate/suggestive evidence of increases for both cohorts in kindergarten (and 1st grade for the 4-year-old cohort).

Parenting Domain

- ▶ Minimal impacts on parenting for 4-year-old cohort
- ▶ 3-year-old cohort showed favorable impacts in all years
 - Head Start year: strong evidence of reduced spanking, increased reading, more cultural enrichment
 - Age 4 year: strong evidence of decreased authoritarian parenting style
 - Kindergarten year: evidence of reductions in spanking and time out*
 - 1st grade year: evidence of reduced time out* and authoritarian parenting

*Impacts on time out interpreted as favorable in light of other impacts on social-emotional and parenting in same year.

Exploratory Analysis of Child and Family Subgroups

Subgroups Examined

- ▶ Child's Pre-Academic Skills (lowest quartile)
- ▶ Child's Home Language
- ▶ Special Needs
- ▶ Biological Mother's Race/Ethnicity
- ▶ Parent's Reported Depressive Symptoms
- ▶ Household Risk Index
- ▶ Urbanicity

Approach

- ▶ 2 cohorts X 3 (or 4) data points X 7 subgroup dimensions (18 categories) = LOTS of comparisons
- ▶ Needed an approach that balanced type I and type II errors
- ▶ Subgroup analyses were considered more exploratory, so chose to present everything, but focus on patterns

Analytic Approach

- ▶ Discussion of findings concentrated on
 - Differential impacts across subgroups (i.e., “difference in difference”)
 - Impacts that occur across domains or outcomes and that persist into kindergarten and 1st grade.
 - Benjamini–Hochberg adjustments were also used and reported, although we did not require impacts to pass this test in order to be considered a pattern.

Exploratory Subgroup Findings

- ▶ Favorable patterns identified for several groups in each age cohort (details on next two slides).
- ▶ A few subgroups showed patterns of mixed or unfavorable impacts, most notably children of parents with moderate depressive symptoms in the 3-year-old cohort.

Favorable Impacts

4-year-old cohort:

- ▶ *Children of parents with mild depressive symptoms* – favorable cognitive impacts through the end of 1st grade
- ▶ *Children in the lowest academic quartile at baseline* – favorable social-emotional impacts through the end of 1st grade
- ▶ *Dual language learners* – increased health insurance at the end of kindergarten and 1st grade
- ▶ *Black children* – favorable social-emotional impacts through the end of kindergarten

Favorable Impacts (cont.)

3-year-old cohort:

- ▶ *Children with special needs* – benefited in math and social-emotional areas at end of 1st grade
- ▶ *Children whose parents had no depressive symptoms* – benefited in the cognitive, social emotional, and parenting domains through the end of 1st grade
- ▶ *Children from high-risk households* – cognitive impacts at end of 1st grade
- ▶ *Children in non-urban settings* – sustained cognitive impacts through the end of 1st grade, social-emotional benefits in Head Start years
- ▶ *Dual language learners* – cognitive impacts through the end of kindergarten

Thoughts

- ▶ Ambitious mandate
- ▶ Access to Head Start had a positive impact on children's exposure to high quality early care and education environments.
- ▶ On average, translated into favorable impacts at the end of one year. Impacts on more outcomes for the 3-year-old cohort
- ▶ Preschool impacts not large enough to show sustained differences by the end of 1st grade.

Availability of Data

- ▶ Data through the end of 1st grade are now available on a restricted access basis through Head Start Data Archive (ICPSR).

Report on Third Grade Follow-up

Data Sources

- ▶ Children – Assessments and Student Survey
- ▶ Parents /primary caregivers
- ▶ Teachers
- ▶ Principals

Measures

▶ Cognitive

- Child Assessments – ECLS–K Reading, PPVT, WJ III Letter–Word Identification, Applied Problems and Calculation
- Teacher reports of school performance

▶ Social–Emotional

- Parental reports of Parent Child Relationship and Abbreviated CBCL
- Child report from Self–Description Questionnaire (SDQ)
- Teacher report of Teacher Child Relationship, Social Competencies, and Strengths and Difficulties Questionnaire

Measures (cont.)

▶ Health

- Parental reports of health and health care

▶ Parenting Practices

- Parental reports of parenting activities and approaches
- Teacher report of parent participation

▶ School Experiences

- Principal report of school type and size, educational needs, quality of instructional resources, school governance and decision making
- Secondary information on schools
- Teacher report of school supports, education and experience, and reading/language arts and math instruction

Experimental Impacts for 3rd Grade

- ▶ As with 1st grade:
 - Impacts on child and parent outcomes
 - Repeat subgroup impacts on all outcomes
 - Impacts on characteristics of 3rd grade school, teachers and classroom instruction

New Quality and School Experiences Analyses

New Research Questions

- ▶ How are impacts at pre-k, 1st grade and 3rd grade moderated by Head Start quality?
- ▶ How are long term impacts at kindergarten moderated by school experiences at kindergarten; at 1st grade moderated by school experiences at 1st grade; and at 3rd grade moderated by school experiences at 3rd grade?

New Research Questions (cont.)

- ▶ How are 3rd grade impacts moderated by the combined school experiences at kindergarten, 1st grade, and 3rd grade?

Research Question 1

- ▶ How are impacts at pre-k, 1st grade and 3rd grade moderated by Head Start quality?

Measures

- ▶ Outcomes
 - Cognitive
 - Social–Emotional
- ▶ Head Start Quality Measures
 - Process (ECERS–R, Arnett)
 - Structural (teacher education and qualifications, teacher child ratio, teacher training)
 - Activities and Experiences (parent report of child experiences, math and language classroom activities)

Head Start Quality as a Moderator of Impacts: What We Learn

- ▶ Will tell policymakers whether participation in higher quality Head Start programs yields larger impacts on child development in pre-k, 1st grade and 3rd grade.

Head Start Quality as a Moderator of Impacts: Analysis Plan

- ▶ Express children's developmental outcomes in pre-k, 1st grade and 3rd grade as functions of Head Start quality measures for their centers of random assignment
- ▶ Include other child/family, center, and grantee characteristics in the model
- ▶ Interact Head Start quality measures with the treatment group indicator, to learn how quality affects impacts on child development

Research Questions 2 and 3

- ▶ How are long term impacts at kindergarten moderated by school experiences at kindergarten; at 1st grade moderated by school experiences at 1st grade; and at 3rd grade moderated by school experiences at 3rd grade?
- ▶ How are 3rd grade impacts moderated by the combined school experiences at kindergarten, 1st grade and 3rd grade?

Measures

- ▶ Outcomes
 - Cognitive
 - Social–Emotional
- ▶ Quality of Experiences
 - Teacher credentialing
 - Teacher beliefs
 - Classroom social and instructional processes
 - Parent involvement
 - School–level resources

School Experiences as Moderators of Impact: What We Learn

- ▶ Will tell policymakers whether attending better quality schools results in less fade-out of Head Start's early impacts once children reach kindergarten, 1st grade or 3rd grade.

School Experiences as a Moderator of Impacts: Analysis Plan (RQ2)

- ▶ Express children's developmental outcomes in kindergarten, 1st grade and 3rd grade as functions of elementary school quality (child level)
- ▶ Include other child/family, center and grantee characteristics in the model
- ▶ Interact elementary school quality measures with the treatment group indicator to learn how quality affects impacts on child development at each grade level

School Experiences as a Moderator of Impacts: Analysis Plan (RQ3)

- ▶ Express children's developmental outcomes at 3rd grade as a function of cumulative elementary school quality across kindergarten, 1st grade, and 3rd grades (child level)
- ▶ Include other child/family, center and grantee characteristics in the model
- ▶ Interact cumulative elementary school quality measures with the treatment group indicator to learn how quality affects impacts on child development at 3rd grade

Questions?

- ▶ camillaheid@westat.com
- ▶ The Head Start Impact Study Final Report is available at:

http://www.acf.hhs.gov/programs/opre/hs/impact_study/reports/impact_study/hs_impact_study_final.pdf