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# Relationship of Program and Classroom Characteristics to Children's Cognitive Gains and Social Development in Head Start

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# Introduction

- The 2000 cohort of the Head Start Family and Child Experiences Survey (FACES) found gains by children in vocabulary and early writing, and increased learning of letter recognition compared to 1997.
- The study also found significant gains in children's cooperative behavior and declines in problem behavior.



# Introduction (2)

- This presentation examines variations in children's cognitive and social-emotional development and their relationships to program and class characteristics that are believed to be associated with enhanced cognitive growth or emotional maturation.



# Characteristics Believed to “Make A Difference”

- Using an integrated and comprehensive preschool curriculum
- Having more ample program resources
- Providing classrooms of higher quality as early learning environments
- Employing a better prepared teaching staff



# Characteristics Believed to “Make A Difference” (2)

- Providing preschool services for a longer period each day
- Conducting educational activities in smaller groups with more personal attention to needs and preferences of individual children
- Encouraging parents to engage in more educational activities with their children at home



## Program-Level

### Program Characteristics

- Characteristics of Families
- Primary Curriculum
- Teacher Salaries

## Classroom-Level

### Teacher Characteristics

- Experience and Training  
(education, years teaching)
- Attitudes and Knowledge about  
ECE Instructional Practices
- Demographics (age, ethnicity)
- Salary level (as deviation from  
program mean)

### Classroom Quality

- ECERS-R Language
- Teacher Sensitivity
- Teacher Individualizing
- Child-Adult Ratio

### Full-Day versus Part- Day Class

## Child-Level

### Child and Family Characteristics

- Child Characteristics
- Parent Education, Household Income,  
Welfare Status, Family Structure
- Parent Literacy Level
- Books in Home
- Educational Activities at home

### Children's Level of Achievement and Fall Spring Gains

- Cognitive Skills
- Behavioral and Social Skills

Figure 1. Analytical Model of Multi-Level Factors Predicting to Classroom Quality and Children's Achievement and Gains in the Head Start year



# Analysis Method

- Three-level Linear Regression Models using SAS PROC MIXED to predict achievement gain or behavior improvement from program-, classroom-, and child-level factors.



# Child Achievement Measures

- Word Knowledge (PPVT-III)
- Letter Recognition (WJ-R Letter-Word ID)
- Early Writing (WJ-R Dictation)
- Early Math (WJ-R Applied Problems)
- Criterion-referenced measures of social communication, color recognition, one-to-one counting, book and print awareness





# Child Behavior Measures

- Teacher ratings of Cooperative Classroom Behavior
- Teacher ratings of Problem Behaviors (Aggression, Hyperactivity, Withdrawal)
- Parent ratings of Positive Approaches to Learning and Social Skills
- Parent ratings of Problem Behaviors (Aggression, Hyperactivity, Withdrawal)



# Analysis Subsamples

- PPVT-III (English and Spanish combined, 3-5 year olds,  $n = 1,984$ )
- WJ-R Letter-Word ID (English and Spanish combined, 4-5 year olds only,  $n = 957$ )
- WJ-R Dictation (English only, 4-5 year olds only,  $n = 751$ )
- WJ-R Applied Problems (English only, 4-5 year olds only,  $n = 778$ )



# Analysis Subsamples (2)

- Teacher ratings of Cooperative Classroom Behavior (n = 2,138)
- Teacher ratings of Problem Behaviors (n = 2,045)
- Parent ratings of Social Skills and Positive Approaches to Learning (n = 2,199)
- Parent ratings of Problem Behaviors (n = 2,200)



# Program-Level Predictors

- Characteristics of Families Served by Program
  - Mean parent education level
  - Mean family income level
  - Percent non-minority students in program
  - Percent language minority students in program
- Primary Curriculum Used in Majority of Classrooms
  - High Scope Curriculum
  - Creative Curriculum
- Program Resources
  - Average Annual Teacher Salary



# Classroom-Level Predictors

- Teacher Background and Experience
  - Years of teaching experience (total years)
  - Teacher holding a BA or AA
  - Teacher ethnicity (African-American, Hispanic)
  - Teacher salary (as deviation from program average)
- Teacher Beliefs
  - Teacher Attitudes and Knowledge About Early Childhood Education Practices
- Full-Day versus Part-Day Class



# Classroom Quality Measures

- Early Childhood Environment Rating Scale  
-- Revised (ECERS-R) Language Scale
- Caregiver Interaction Scale (Arnett) Score



# Group Size and Individual Attention Measures

- Child/Adult Ratio
- Assessment Profile Individualizing Score



# Parent Educational Activities Measures

- Frequency of parent reading to child in last week (self-reported):
  - Not at all
  - Once or twice
  - Three to six times (omitted reference group)
  - Every day
- Entered into analysis as child-level variables.





# Child-Level Predictors

- Child Characteristics
  - Age in months
  - Gender
  - Race/ethnicity (Black, Hispanic)
  - Disability status
- Parent Literacy Level
  - Mother's standard score on K-FAST test of functional literacy
- Presence of books in home



# Child-Level Predictors (2)

- Family Background
  - Parent education level (as deviation from program and class means)
  - Family income level (as deviation from program and class means)
  - Language minority family
  - Welfare status
  - Both biological parents present in HH
  - Neither biological parent present in HH



# Findings

- As in FACES 1997, FACES 2000 found considerable diversity in the achievement of Head Start children, both across programs and classes and within classes.
- Achievement differences across programs and classes had more to do with socio-economic characteristics of population served than with quality differences.



# Findings (continued)

- Program differences greater for measures (such as vocabulary) that correlated more with SES and ethnicity.
- There were significant differences in cognitive and behavioral gains that related to program characteristics other than population served.

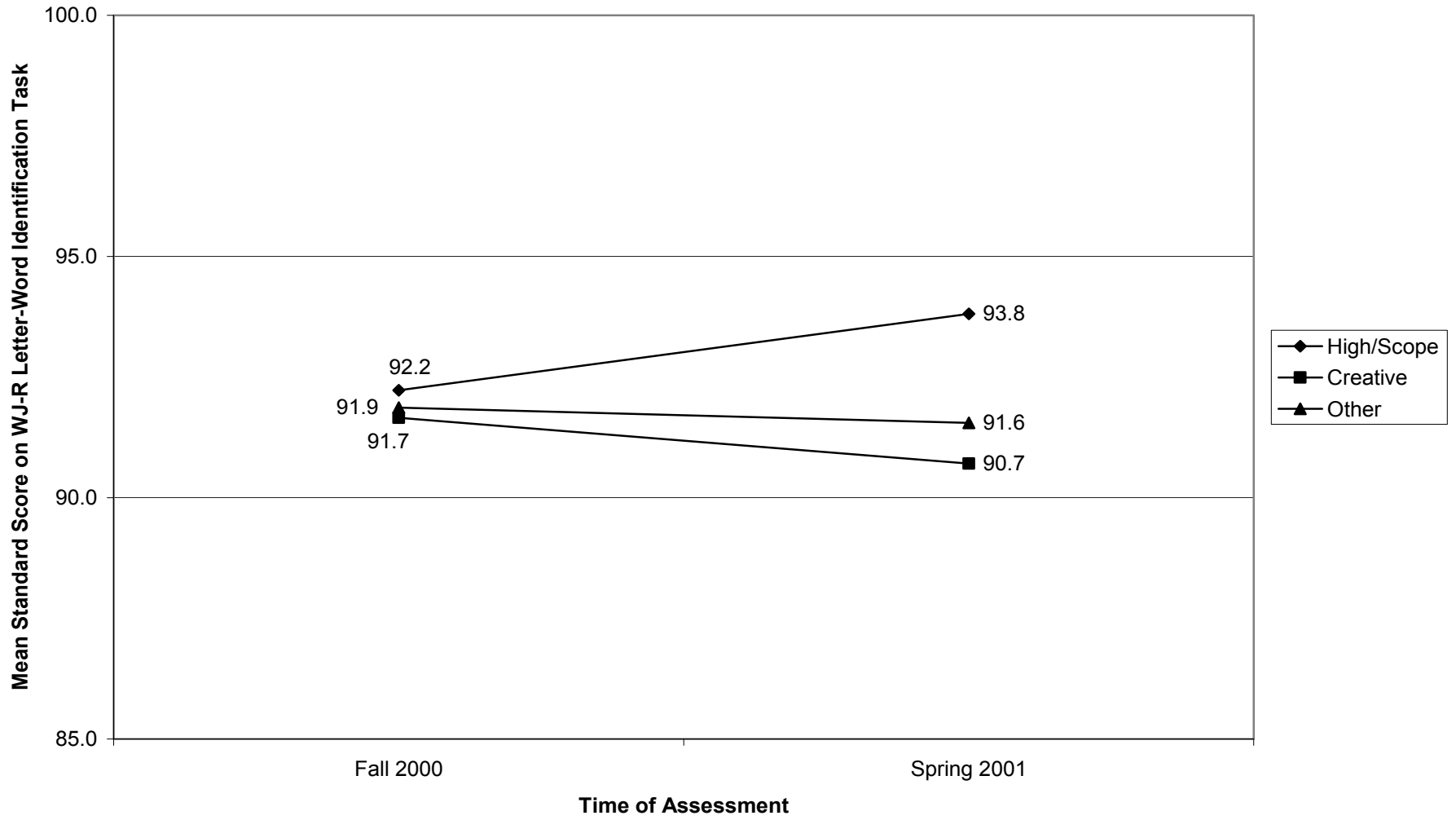


# Hypotheses Confirmed

- Use of integrated curriculum associated with greater gains in letter recognition, cooperative behavior, declines in total behavior problems, hyperactivity.
- Higher teacher salaries associated with greater gains in letter recognition, cooperative behavior, declines in hyperactivity.
- Higher Teacher education credentials associated with greater gains in early writing skills (evidence mixed).



**Figure 2. Children in Head Start Programs using High/Scope Curriculum Show Greater Gains in Letter Recognition Skills**

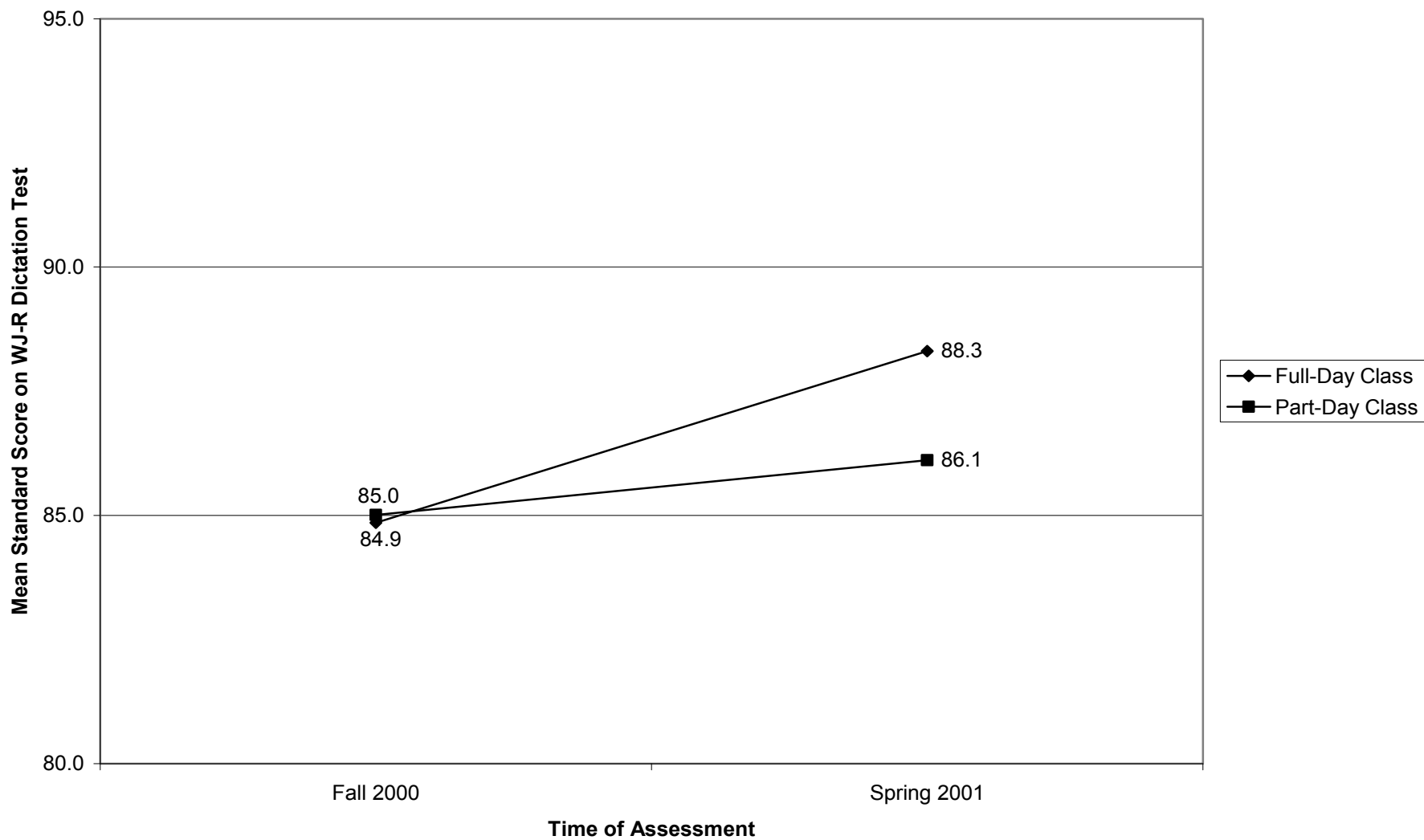


# Hypotheses Confirmed (2)

- Full-day class associated with greater gains in letter recognition and early writing skills than part-day class.
- More frequent parental reading associated with greater gains in vocabulary knowledge and letter recognition.



**Figure 7. Children in Full-Day Head Start Classes Show Greater Gains in Early Writing Skills**



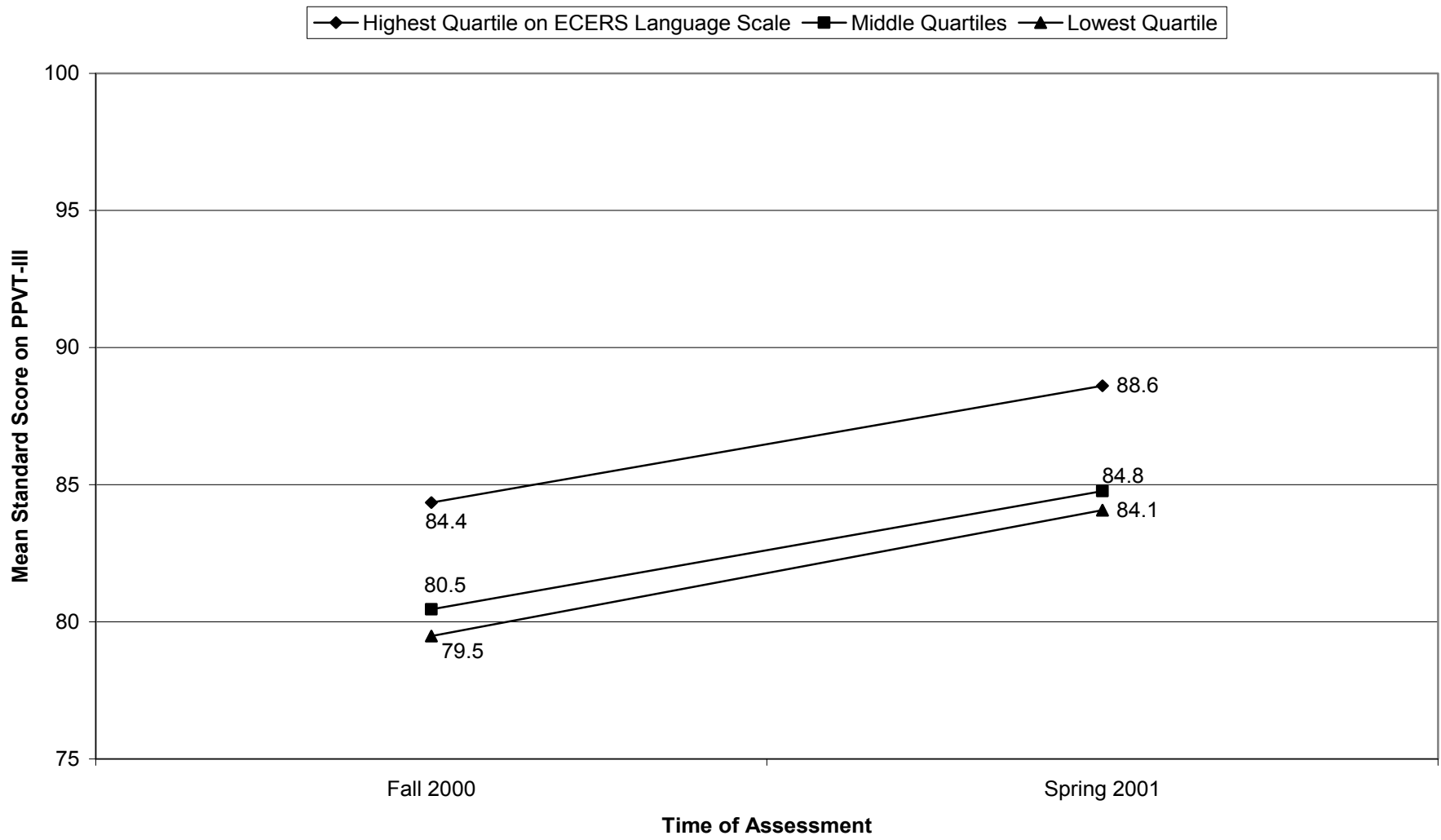


# Hypotheses Not Confirmed

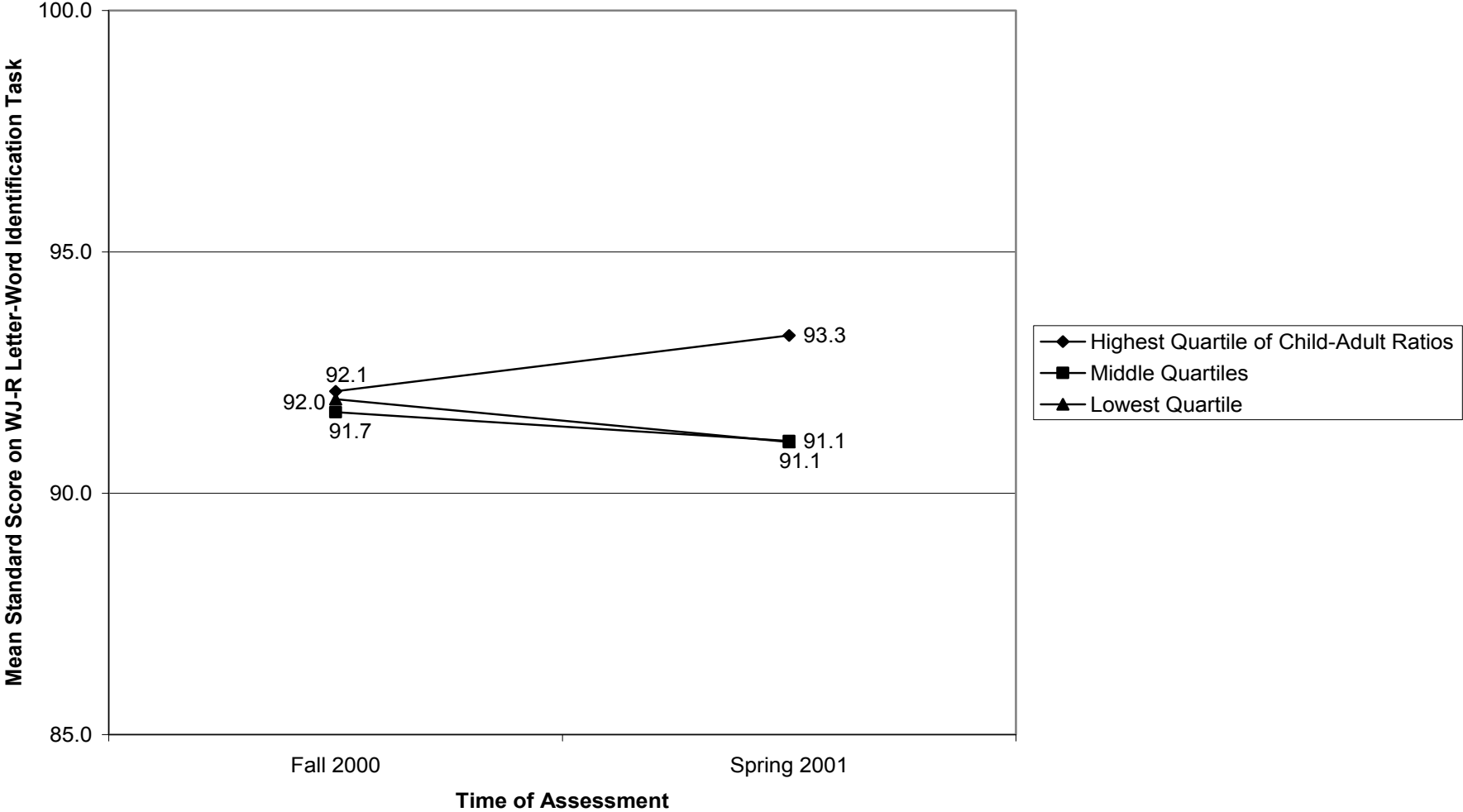
- Children in higher and lower quality classes on ECERS-R Language scale made equivalent gains in vocabulary knowledge and pre-reading skills.
- Caregiver Interaction Scale scores not associated with gains in social-emotional or cognitive measures.
- *Larger* Child-Adult Ratios associated with greater gains in letter recognition.
- Assessment Profile Individualizing scores not associated with cognitive or social gains.



**Figure 9. Children in Head Start Classes with Higher, Moderate, and Lower Quality Language Activities Show Parallel Gains in Vocabulary Knowledge**



**Figure 10. Children in Head Start Classes with Higher Child-Adult Ratios Show Larger Gains in Letter Recognition**



# Conclusions

- Use of an integrated and well-supported curriculum associated with children's cognitive and social-emotional gains in Head Start.
- Program resources as indicated by higher teacher salaries associated with children's cognitive and social-emotional gains in Head Start.



# Conclusions (2)

- Greater teacher preparation, as indicated by teacher education credentials and salary levels, associated with gains in some cognitive areas, not others.
- Providing preschool for longer periods each day associated with greater cognitive gains in Head Start.



# Conclusions (3)

- Within generally good quality range of Head Start classrooms, variation in quality as measured by ECERS was not associated with achievement gains in Head Start.
- Within narrow range of class size in Head Start, child/adult ratios were not associated or were negatively associated with achievement gains.



# Conclusions (4)

- Gain differences were relatively modest in magnitude.
- FACES study is correlational, definitive causal conclusions cannot be made.
- Recent Head Start intervention studies suggest that greater gains are possible with appropriate research-based instructional activities.

