Learning Outcomes of Low-Income Preschool Children Selected for Intensive Instruction

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PROBLEM

- Children from low income families enter school already behind on measures of important literacy skills (NELP, 2008)
- Even given excellent teaching, about 20% of these children are likely to need additional individual instruction if they are to close the gap with their peers (Whitehurst & Fischel, 2000)
- RTI is one approach to preventing future reading difficulties and closing the gap for low-income children (Gettinger & Stoiber, 2009)
- Few descriptions are available of the characteristics of children who may need additional support through RTI (demographics, scores)
- Few studies of RTI interventions have been conducted with preschool children

RESEARCH QUESTIONS

1. What are the demographic characteristics of children who meet the criteria for Tier 2 (tutoring) in comparison to classroom peers when children with IEPs are included?
2. What are the demographic and skill characteristics of low income children eligible for Tier 2 when children with IEPs are excluded?
3. How do results for low-income children receiving both Tier 1 and Tier 2 tutoring compare to those of low-income children not eligible for tutoring, receiving only Tier 1?

CLASSROOM CONTEXT

- 16 classrooms in four programs in an Early Reading First Project in a small city in the Midwest
- Sites include District pre-K (8 classrooms), Head Start (3), Community college child care (2), Community agency childcare (3)
- Most classrooms (12) directed primarily toward children at risk based on income; 4 classrooms blended and include children with disabilities; all children were eligible for Kindergarten in following year
- Lead teachers – 62% Bachelor's or above; Assistant teachers – 75% Associate degree
- Implementation of TROPHIES Curriculum in all classrooms; intensive professional development including weekly coaching

TUTORING PROCEDURES

Screening (GOM) – Fall and Winter – 10 measures
- PALS Pre-K (5)
- IGDIs (3)
- PPVT – IV
- ISELS Story Comprehension

The tutor assists in reading dictation. The tutor uses the "hand-over-hand" strategy to help the child point to each word as they read the sentence.

Selection of Children for Tier 2
- Initial selection
  - based on fall assessment and mid-year assessment
  - <85 standard score on PPVT and below benchmark on letter naming and/or comprehension
  - OR below benchmark on letter naming and comprehension
  - OR two months with no progress on CBMs related to curriculum or no progress on GOMs from fall to winter assessment
- Maintaining in Tier 2 - GOM at mid-year; same criteria

Tier 2 Intervention
- Format
  - small group tutoring, twice per week, approximately 30 minutes; average of 34 intervention sessions per child during school year (range: 20-40)
  - specific format of intervention targets across the week
  - storybooks provided to match curriculum themes; phonological awareness games provided; tutors plan activities, implement specific strategies
- **Tutors** - retired teachers (3) and graduate students in ECSE (4)
- **Fidelity** - to tutoring protocol: average of 88.1 (range: 50-100)

The tutor writes the child's dictation about how he uses "Water". The child points out where to start and which direction to go as the tutor writes.

INSTRUMENTATION/DATA COLLECTION

- Primary - 10 general outcome measures (as above)
  - tested three times/year
  - testing team (former early childhood/elementary teachers; trained on all measures)
- Secondary - curriculum-based measures developed by project (end of each curriculum unit, intervals of approximately 5-6 weeks; teacher-administered)

Disclaimer

RESULTS

Question 1: *What are the demographic characteristics of children who meet the criteria for Tier 2 (tutoring) in comparison to classroom peers when children with IEPs are included?*

Demographics of All Children Selected for Tier 2 in Comparison to Peers

Summary
- 29% of children were eligible for Tier 2
- Greater proportions of children in Tier 2 were African-American or Hispanic, were from low-income families, had IEPs, and were in their 1st year in DELL-D
- There were significant relationships among these variables (e.g., proportionately more children with IEPs selected for Tier 2, greater proportion of Caucasian children among children with IEPs)

Characteristic/Group		Children Selected for Tier 2 (n=44)	Other DELL-D Children (n=131)
Gender	Male	.55	.51
Ethnicity	Caucasian	.14	.50
	African-American	.71	.37
	Bi-Racial	.05	.08
	Hispanic	.11	.03
	Asian/Other	.00	.02
Income	Free/reduced lunch	.89	.73
IEP Status	No IEP	.66	.89
Time in DELL-D	2nd Yr in DELL-D	.43	.50
Months Age at Entry	Mean (standard deviation)	54.09 (SD 3.25)	54.83 (SD 3.72)

Question 2: *What are the demographic and skill characteristics of low-income children eligible for Tier 2 in comparison to classroom peers when children with IEPs are excluded?*

A. Demographics of Children Selected for Tier 2 in Comparison to Peers

Characteristic/Group		Children Selected for Tier 2 (n=44)	Other DELL-D Children (n=131)
Gender	Male	.48	.47
Ethnicity	Caucasian	.12	.48
	African-American	.72	.45
	Bi-Racial	.04	.05
	Hispanic	.12	.02
	Asian/Other	.00	.00
Time in DELL-D	2nd Yr in DELL-D	.43	.50
Months Age at Entry	Mean (standard deviation)	53.44 (SD 2.66)	54.55 (SD 3.35)

Summary
- 23% of low income children were eligible for Tier 2
- Greater proportions of children selected for Tier 2 were African-American or Hispanic and were in their 1st year in DELL-D

B. Fall Scores of Children in Tier 2

Measure/Group	Children in Tier 2 (n=20)*		Other DELL-D Children (n=75)*		ANOVA Comparisons	
	Mean	s.d.	Mean	s.d.	F	p value
Name Writing	3.45	1.32	4.72	1.64	10.206	.002
Capital Letters	1.00	1.72	11.49	9.56	23.70	.000
Small Letters	.65	1.14	7.80	8.02	15.70	.000
Letter Sounds	.00	.00	2.67	4.67	6.48	.013
Print Concepts	2.70	1.95	5.31	5.54	24.45	.000
Rhyming	2.74	2.85	4.74	4.72	3.12	.081
Picture Naming	18.05	4.50	22.88	6.04	10.63	.002
Alliteration	1.89	2.21	3.64	3.60	4.08	.046
PPVT-IV	81.12	8.49	98.70	13.18	39.25	.000
Listening Comp.	4.05	2.96	9.28	4.17	27.62	.000

Summary of Fall Scores
- Scores of children selected for Tier 2 were significantly lower in 9/10 areas of emergent literacy measured
- Rhyming, an area in which many children scored zeros, was the only exception (floor effect)

Question 3: *How do results for low-income children receiving both Tier 1 and Tier 2 tutoring compare to those of low-income children not eligible for tutoring, receiving only Tier 1?*

A. Gain Scores (Analysis of gain scores, with tutoring/no tutoring as predictor variable)

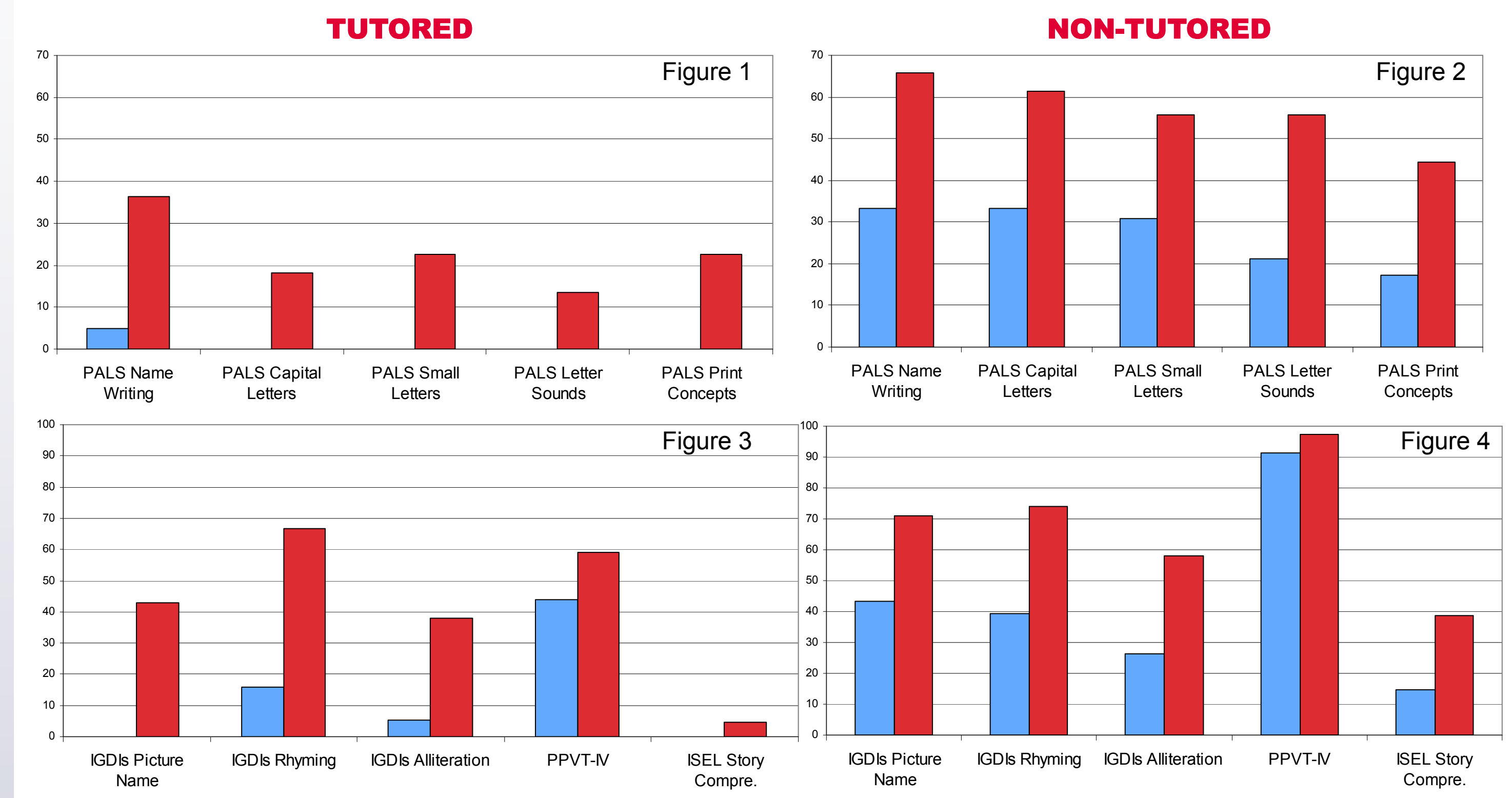| Measure/Group	Children in Tier 2		Other DELL-D Children		ANOVA Results	
	Mean	s.d.	Mean	s.d.	F	p value
Name Writing	1.59	1.37	.97	1.41	2.61	.11
Capital Letters	8.29	6.02	6.59	5.59	1.20	.28
Small Letters	6.24	4.82	6.98	5.74	.24	.62
Letter Sounds	1.64	3.14	5.69	5.37	8.76	.004
Print Concepts	3.47	1.94	1.73	2.06	9.73	.003
Picture Naming	5.47	4.31	3.78	5.69	1.16	.285
Rhyming	5.87	4.90	4.83	5.27	.485	.49
Alliteration	2.47	3.52	3.21	4.61	.337	.56
PPVT-IV	6.18	9.25	3.14	10.05	1.59	.21
Story Comp.	5.29	3.65	3.11	3.38	5.42	.022

Summary— Comparison of Gain Scores*
- Gains made by children in Tier 2 were larger than Tier 1 children in 7/10 areas measured (significant differences in print concepts and story comprehension)
- Children in Tier 1 made larger gains in 3/10 areas (significant difference in letter sounds)
- Generally, children in Tier 2 did NOT lose ground in comparison to peers, and were moving toward closing gaps in several areas
- Higher gains by children in Tier 1 tended to be in more advanced "code-related" areas (lower-case letters, letter sounds, alliteration), whereas higher gains made by children in Tier 2 tended to be in "meaning-related" areas (vocabulary, listening comprehension) as well as in less-advanced code-related areas (capital letters, print concepts, name writing)

Children present for the entire year included 15-22 tutored children and 63-70 non-tutored children, depending on the test.

B. Percent of Children Meeting Pre-K Exit Benchmarks, Fall & Spring (Figures 1-4)
(Analysis— Benchmarks were selected from test booklets (PALS, PPVT) or best available information (IGDIs, ISELS); graphs represent children present in the fall and those present in the spring, and may under-represent effects on children present for the full year).

TUTORED

Figure 1 — PALS Name Writing, PALS Capital Letters, PALS Small Letters, PALS Letter Sounds, PALS Print Concepts

NON-TUTORED

Figure 2 — PALS Name Writing, PALS Capital Letters, PALS Small Letters, PALS Letter Sounds, PALS Print Concepts

Figure 3 — IGDIs Picture Name, IGDIs Rhyming, IGDIs Alliteration, PPVT-IV, ISEL Story Compre.

Figure 4 — IGDIs Picture Name, IGDIs Rhyming, IGDIs Alliteration, PPVT-IV, ISEL Story Compre.

Legend: FALL, SPRING

Summary of Figures 1-4
- On some measures children in Tier 2 started the year with no children at benchmark; in the non-tutored group, some children were already at benchmark on all fall assessments
- Both tutored and non-tutored children ended the year with a larger percentage meeting benchmark established for exit from Pre-K in all areas
- Children in Tier 2 showed the least growth in Story Comprehension
- Many children in both groups finished the year not yet having achieved benchmark; this was especially true in listening comprehension

DISCUSSION

Selection criteria used for Tier 2:
- Resulted in selection of low-income children (without IEPs) who were behind their peers in 9/10 areas measured; criteria used therefore appear to have resulted in selection of the children in most need
- Resulted in a larger proportion of African-American children selected; it is unknown whether tests are biased or whether these proportions are an accurate indication of need
- Including children with IEPs in selecting children for Tier 2 increased the proportion of children eligible for Tier 2 from 23% to 29%

Small-group tutoring as implemented here:
- Yielded gains for tutored children that exceeded those of non-tutored children, in some areas
- Did not close the gap in scores
- Resulted in children who received tutoring gaining most in meaning-related skills, whereas their peers gained most in code-related skills; this should be explored in further research
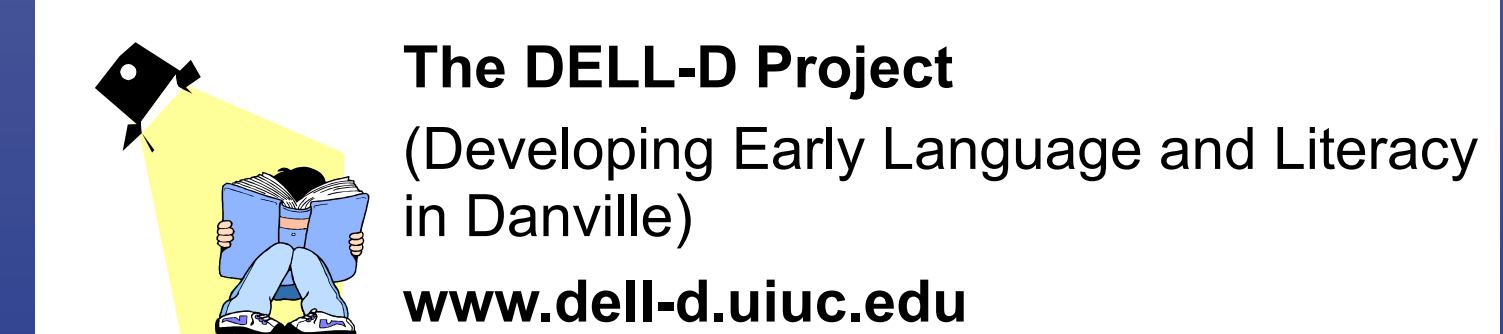
Limitations
- Small number of children, especially in those present for the full year of tutoring
- Lack of a control group - comparisons are of Tier 1 intervention alone and Tier 1 with Tier 2 as "value added"
- Effects of classroom not controlled due to small number of children
- For some measures, there are no standardized benchmarks; some benchmarks may or may not be at an appropriate level for evaluating child progress (e.g., Story Comprehension)

IMPLICATIONS

- While gaps were not closed, children receiving Tier 2 instruction moved toward their peers in 7/10 areas (2 significant)
- It appears that the tutoring intervention used here may supply added value to the general Tier 1 curriculum for children who are most at risk
- Additional discussion is needed of the interrelationships between special education and RTI; in the current sample, children with IEPs comprised a disproportionate number of those receiving Tier 2, based solely on their scores on the screening instruments