

2014 제2차 국제세미나

일시 | 2014. 9. 18. (목) 16:00
장소 | 육아정책연구소 대회의실

- 육아정책연구소 -

2014. 2st KICCE International Seminar

Research Methodology for Analyzing the Effectiveness of Early Education Programs

Date: September 18, 2014. 4pm

Venue: Korea Institute of Child Care and Education Seminar Room

Timetable

Moderator: Dr. Eun Young Kim

Time	Content
4:00pm-4:40pm	INVITED SPEECH <i>Language and Early Math Skill Gains in Head Start Children</i> Kwanghee Jung Associate Director for Data Management and Statistics/ Assistant Professor, National Institute for Early Education Research, Rutgers University, United States
4:40pm-4:50pm	DESIGNATED DISCUSSION <i>Methodology Discussion on the Study of "Language and Early Math Skill Gains in Head Start Children"</i> Jeongrim Lee Research Fellow, Korea Institute of Child Care and Education, Korea
4:50pm-5:00pm	GENERAL DISCUSSION

발 표

Kwanghee Jung
Associate Director for Data
Management and Statistics/
Assistant Professor, National Institute for
Early Education Research, Rutgers University,
United States



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Language and Early Math Skill Gains in Head Start Children

Kwanghee Jung, Ph.D.

National Institute for Early Education Research

Rutgers University



Acelero
Learning

THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS

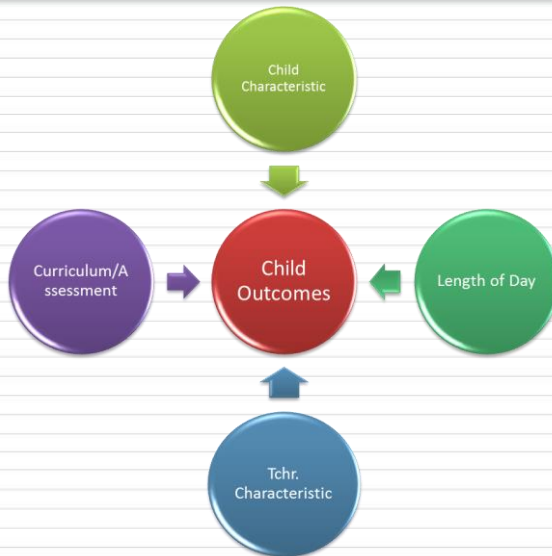


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Goal

- To examine the effects of various preschool programming inputs (children and family characteristics, program structure, curriculum, assessment system used, teacher characteristics) on the learning gains among 3- and 4-year-olds enrolled in Acelero Head Start classrooms.



Research Question

1. How different are the gain scores estimated for the Acelero Head Start children from the gains estimated by Head Start Family and Child Experiences Survey (FACES)
2. What is the relationship between child and family characteristics and these gains?
3. Do varying education components/practices differentially impact these gains?



Data Collection

- Data was collected across three delegate agencies: Monmouth/Middlesex (MM), Camden/ Philadelphia (CP), and Clark County (CC).
- 10 children (five 3 yr olds and five 4 yr olds) randomly selected from each classroom.
- 4 yr olds sample stratified by returning versus newly enrolled 4-year-old students
- 379 returning four-year-olds in the present sample were assessed as three-year-olds in the previous year of this study and will be utilized for longitudinal analyses.



Sample

- Fall 2013
 - N = 1770
- Spring 2014
 - N = 1447
 - 81.75% of the initial sample
- 154 Teachers (Classroom)



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Table 1. Child Demographic Information: Fall 2013 - Spring 2014 (N = 1770)

		Total		Delegate					
				Monmouth/Middlesex		Philadelphia/Camden		Clark County	
		N	%	N	%	N	%	N	%
Ethnicity	White/Asian	127	7.2%	48	8.5%	3	0.7%	75	9.7%
	African-American	584	33.0%	68	12.0%	252	59.4%	263	33.8%
	Hispanic	1020	57.6%	434	76.5%	160	37.7%	426	54.8%
	Other	39	2.2%	17	3.0%	9	2.1%	13	1.7%
Language	English	971	54.9%	178	31.4%	329	77.6%	463	59.6%
	Spanish	736	41.6%	351	61.9%	94	22.2%	291	37.5%
	Other	63	3.6%	38	6.7%	1	0.2%	23	3.0%
Session Type	Full Day	1010	57.1%	435	76.7%	424	100%	151	19.4%
	Half Day (AM)	393	22.2%	76	13.4%	na	na	317	40.8%
	Half Day (PM)	367	20.7%	56	9.9%	na	na	309	39.8%



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Table 2. Teacher Demographic Information: Fall 2013 - Spring 2014

		Total		Delegate					
				Monmouth/Middlesex		Philadelphia/Camden		Las Vegas/Clark County	
		N	%	N	%	N	%	N	%
BA Above		87	74.4%	37	74.0%	16	59.3%	34	85.0%
MA Above		30	25.6%	13	26.0%	11	40.7%	6	15.0%
Experience_at_Acelero	Less than 1 year	34	22.1%	13	24.1%	13	31.0%	8	13.8%
	1 ~ 3 years	70	45.5%	21	38.9%	21	50.0%	28	48.3%
	3 ~ 5 years	28	18.2%	14	25.9%	8	19.0%	6	10.3%
	More than 5 years	22	14.3%	6	11.1%			16	27.6%
Bilingual_Teacher	No	47	30.7%	8	15.1%			39	67.2%
	Yes	44	28.8%	21	39.6%	4	9.5%	19	32.8%
	Missing	62	40.5%	24	45.3%	38	90.5%		



Table 3. Curriculum and Assessment by Delegates

		Total		Monmouth/ Middlesex		Philadelphia/ Camden		Las Vegas/ Clark County	
		N	%	N	%	N	%	N	%
Curriculum	Acelero Curriculum	110	71.4%	27	50%	25	59.5%	58	100%
	Creative Curriculum	37	24.0%	20	37%	17	40.5%	NA	
	Curiosity Corner	5	3.2%	5	9.3%	NA		NA	
	TOOLS	2	1.3%	2	3.7%	NA		NA	
Assessment	ELS	50	32.5%	27	50%	23	54.8%	NA	
	GOLD	97	63.0%	20	37%	19	45.2%	58	100%
	WSS	7	4.5%	7	13%	NA		NA	



Child Assessment Measures

- Vocabulary knowledge: Peabody Picture Vocabulary Test, 3rd Edition (PPVT-III) : explanation note....
- Math skills: Woodcock-Johnson Tests of Achievement, 3rd Edition, Subtests 10 (WJ-III)
- Child Attendance rates
- Child characteristics: Age, ethnicity, IEP status, family income status, family type



Classroom Measures

- The Classroom Assessment Scoring System (CLASS)
 - 10 Dimensions of teacher-child interactions rated on a 7-point scale, from low to high
 - 3 Domains
 - **Emotional Support** assesses the degree to which teachers establish and promote a positive climate in their classroom through their everyday interactions.
 - **Classroom Organization** assesses classroom routines and procedures related to the organization and management of children's behavior, time, and attention in the classroom.
 - **Instructional Support** assesses the ways in which teachers implement the curriculum to effectively promote cognitive and language development.
- Curriculum, assessment systems, program options (half day/full day), teacher characteristics (length of service, education)



Analysis

- Child assessment data were analyzed at classroom, center, and delegate levels.
- Multi-level Regression Analysis (w/wo Center fixed effects):
 - 1st level: Child level
 - Child Age, Gender, Ethnicity, Home Language, IEP status, Attendance rates
 - 2ND level: Classroom Level
 - Teacher Characteristics, Center Size, Length of day, Curriculum, Assessment



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Findings



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Classroom Quality Data



Figure1. CLASS Average by Domain

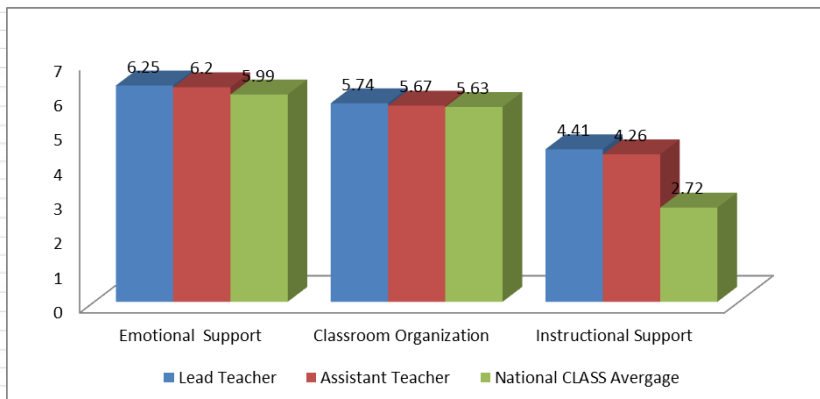


Figure 2. CLASS Domain Average by Delegates

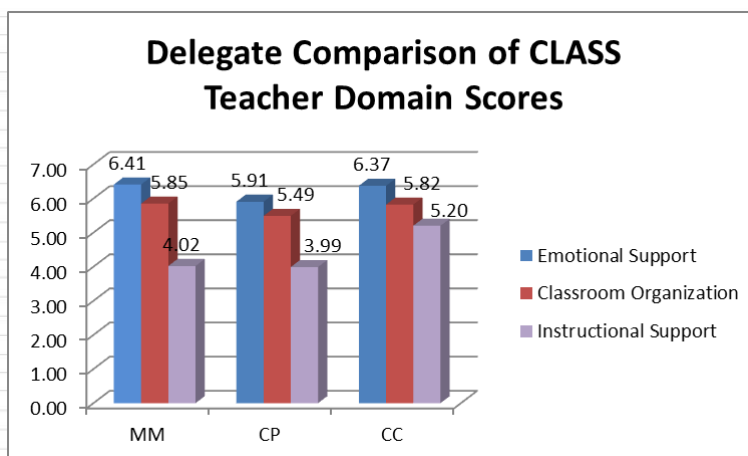




Figure 3. CLASS Dimension Scores

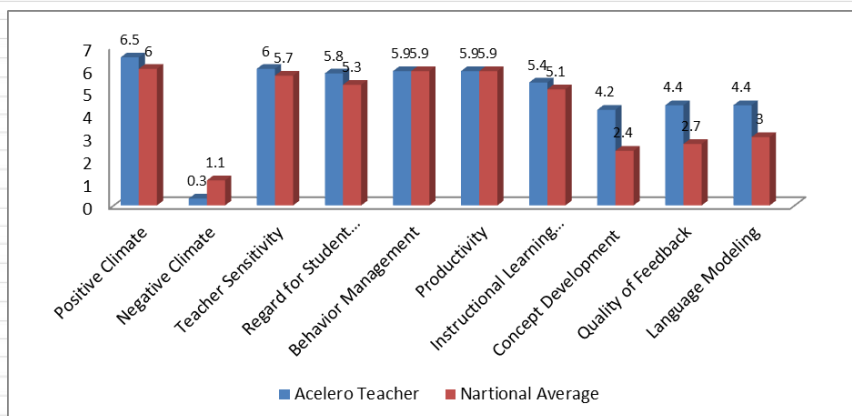
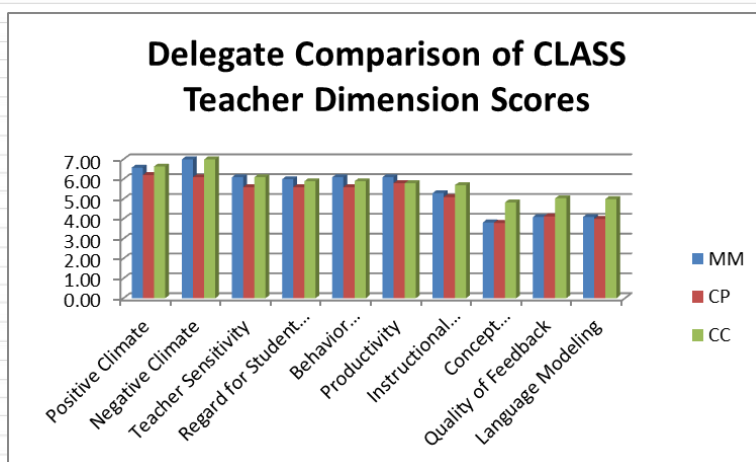


Figure 4. CLASS Dimension Average by Delegates



Note. Negative climate was reverse-coded.



2013-2014 Acelero Learning Child Outcomes

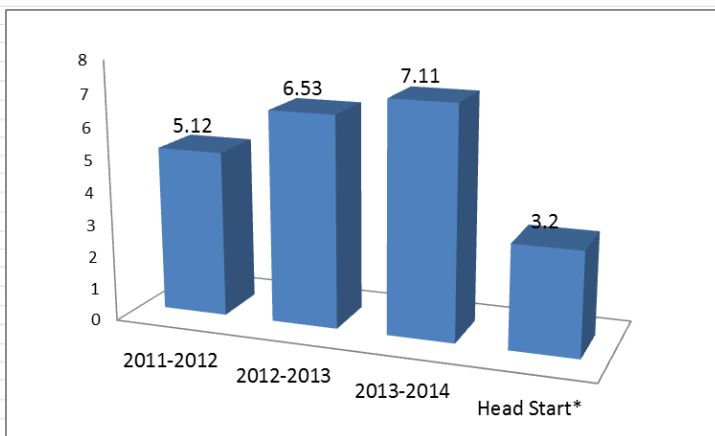


Table 4. PPVT and WJ-Math Gain Scores: 2013_2014

		PPVT ss Gain			WJ ss Gain		
		N	Mean	SD	N	Mean	SD
Gender	Male	738	7.26	14.29	738	5.49	12.15
	Female	709	6.95	13.70	709	3.84	12.26
Ethnicity	White/Asian	97	4.31	12.65	97	1.33	11.12
	Black	450	4.97	13.46	450	2.96	11.77
	Hispanic	875	8.53	14.19	875	5.89	12.46
	Other	25	6.84	15.95	25	6.52	10.68
Language	English	743	5.27	13.30	743	2.83	11.78
	Spanish	655	9.19	14.59	655	6.77	12.38
	Other	49	7.10	12.44	49	5.00	12.63
Session Type	Full Day	873	8.14	13.64	873	5.08	12.61
	Half Day (AM)	302	6.07	15.42	302	3.72	11.66
	Half Day (PM)	272	4.96	13.18	272	4.49	11.55



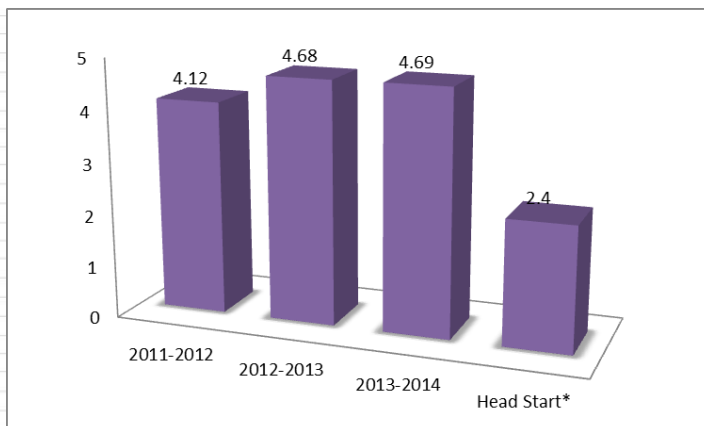
Figure 5. PPVT Gain Scores over Time



*Head Start in 2010 (FACES: Family and Child Experiences Survey)



Figure 6. WJ-Math Gain Scores over Time



*Head Start in 2010 (FACES: Family and Child Experiences Survey)



PPVT Gain Scores by Delegate

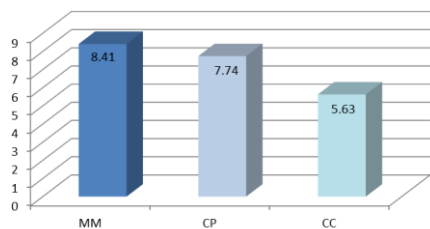
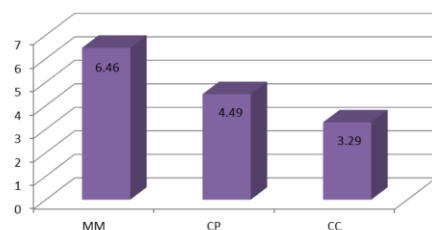


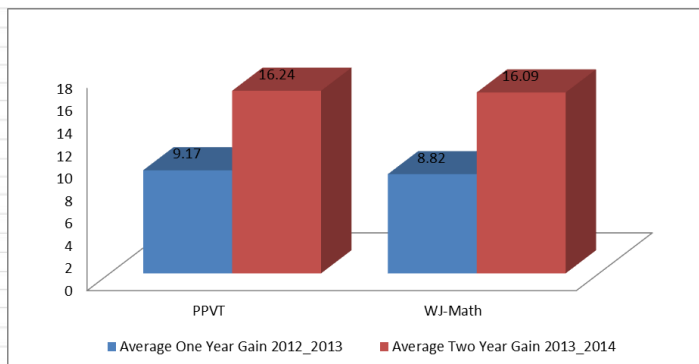
Figure 7

Figure 8

WJ-AP Gain Scores by Delegate



**Figure 9. Longitudinal Sample
Gain during 1 year vs Gain during 2 year
of Acelero Learning Program**





PPVT Gain sores by Ethnicity for Individual Delegates

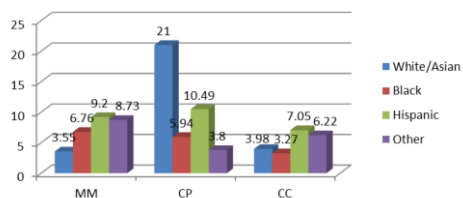
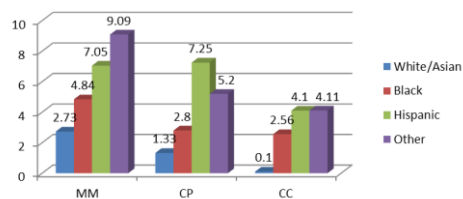


Figure 10

Figure 11

WJ-AP Gain Scores by Ethnicity for Individual Delgates



PPVT Gain Scores by Language for Individual Delegates

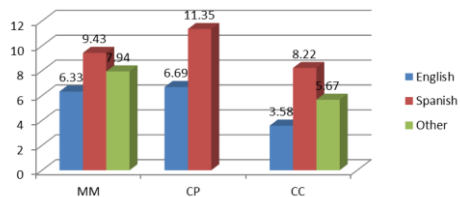
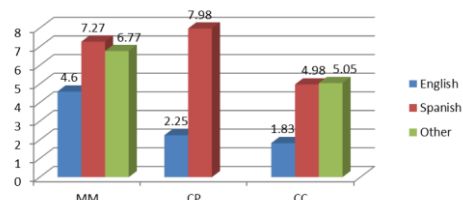


Figure 12

Figure 13

WJ-AP Gain Scores by Language for Delegates





PPVT Gain Scores by Session Type for Individual Delegates

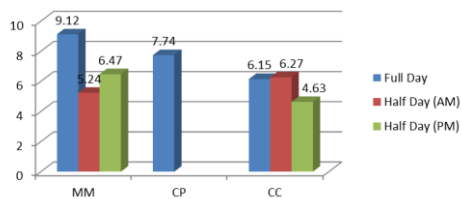
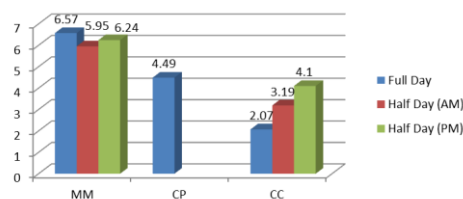


Figure 14

Figure 15

WJ-AP Gain Scores by Session Type for Individual Delegates



PPVT Gain Scores by Teacher Education for Individual Delegates

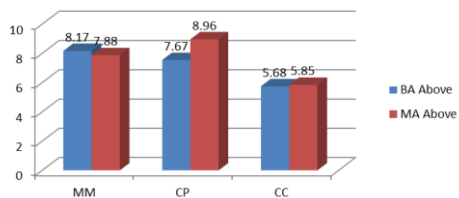
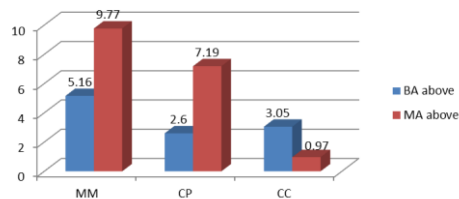


Figure 16

Figure 17

WJ-AP Gain Scores by Teacher Education for Individual Delegates





PPVT Gains by Curriculum for Individual Delegates

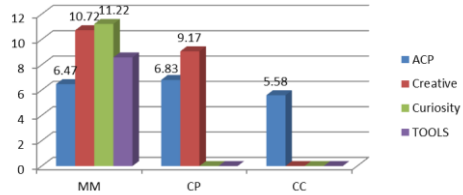
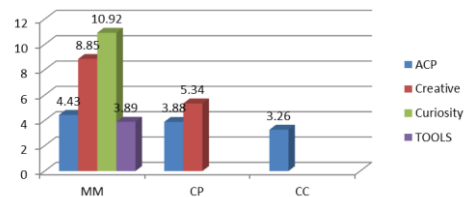


Figure 18

Figure 19

WJ-AP Gain Scores by Curriculum for Individual Delegates



PPVT Gains by Curriculum for Individual Delegates

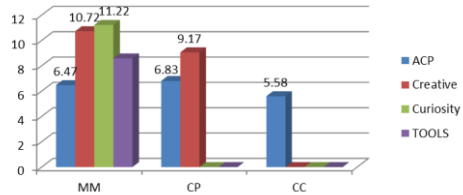
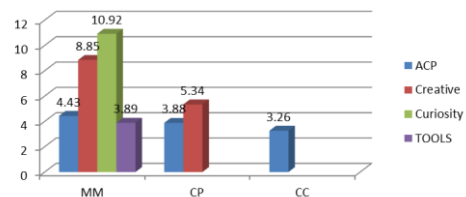


Figure 20

Figure 21

WJ-AP Gain Scores by Curriculum for Individual Delegates





PPVT Gain Scores by Assessment Type for Individual Delegates

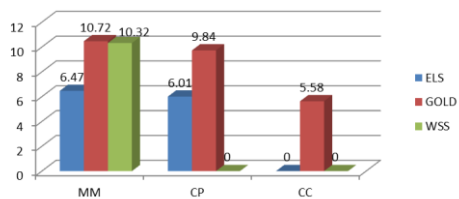
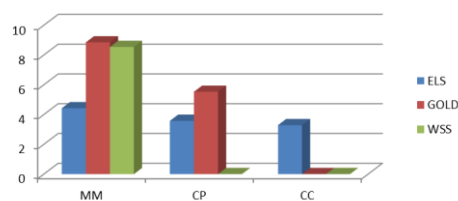


Figure 22

Figure 23

WJ-AP Gain Scores by Assessment Type for Delegates



PPVT Gains by Teacher's Biligualism

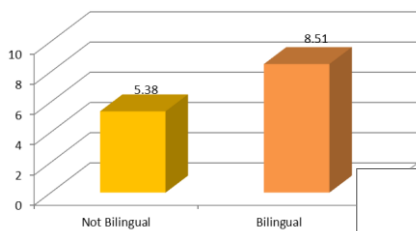
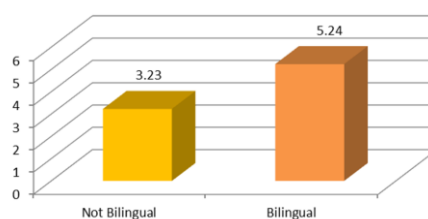


Figure 24

Figure 25

WJ-AP Gains and Teacher's Biligualism





Findings from Multi-level Models

Model 1: Child Characteristics

- In Model 1, Child characteristics and site dummies and center size are controlled in the multi-level model.
- We run models with total sample, followed by MM, CP, and CC sample separately.
- **Spanish speaking** is associated with greater PPVT and WJ-Math gains in total sample as well as CC children.
- **Hispanic children** showed greater PPVT gains than White/Asian children in MM.
- **Hispanic children** showed greater WJ-Math gains than Black children in CP.
- **Center size** was significantly related to PPVT and WJ-Math gains in total sample.



Findings from Multi-level Models

Model 2: Attendance/CLASS

- In Model 2, Attendance rates and CLASS domain scores were added into the model in addition to child characteristics.
- We included Head Teacher CLASS scores and Assistant CLASS scores separately in models. But none of the CLASS domains are significantly related to gain scores.
- Attendance was not related to gains scores.
- **Language (Spanish speaking)** remained significant in predicting PPVT and WJ-Math gains in total sample as well as CC children.
- **Hispanic children** remained significant in predicting greater PPVT gains than White/Asian children in MM.



Findings from Multi-level Models

Model 3: Teacher Characteristics

- In Model 3, we included Teacher Characteristics (Education, Experiences, Bilingual) into the multi-level model in addition to the child characteristics and attendance rates.
- Only significance relationship was found in **Bilingual teacher**. Bilingual teachers had positive impacts on PPVT gains in total as well as CC children.
- **Attendance** became significant in predicting PPVT gains for MM children when teacher characteristics were included.
- **Spanish speaking children** remained significant in association with PPVT and WJ-Math gains in total as well as CC children.
- **Hispanic children** also remained significant in predicting higher gain scores than White/Asian children in WJ-Math (total sample) and PPVT (MM).



Findings from Multi-level Models

Model 4: Length of day/Curriculum/Assessment/Center size

- In Model 4, we included Length of day, Curriculum/Assessment and Center size into the multi-level model in addition to the child characteristics and attendance rates.
- In MM model, Curriculum (Creative curriculum, Curiosity corner, and Acelero and TOOLS) and Assessment (Gold, ELS, WSS) and Full day/Half day were included.
 - **TOOLS curriculum** associated with lower Math gains than Acelero curriculum.
 - **Attendance** was significantly associated with greater PPVT gains.
- In CP model, Curriculum (Creative Curriculum and Acelero) and assessment (ELS and GOLD) were included.
 - None of the Curriculum and Assessment showed significant impact on gain scores.
- In CC model, Full day/Half day was included in the model in addition to child characteristics.
 - **Center size** was negatively associated with WJ-Math



Conclusion

- Attendance Rates
- Hispanic/Spanish Speaking
- Children in Acelero curriculum performs better than Tools curriculum in MM
- Bilingual Teacher
- Center size



Conclusion

- Acelero CLASS scores were higher than FACES, but non significant effect for Learning outcomes
- Length of day: Non-significant impact on learning outcomes

토론

Jeongrim Lee
Research Fellow,
Korea Institute of Child Care and
Education,
Korea

Methodology Discussion on the Study of “Language and Early Math Skill Gains in Head Start Children”

Jeongrim Lee (KICCE)

□ **This study examined the learning gains of children aged 3 to 4 in Acelero Head Start program using variables of child/family characteristics, teacher characteristics, types of curriculum, program organization, and types of assessment.**

- Variables for children characteristics were ethnicity, mother language, and program's length of day.
- Teacher characteristics variables were educational background, teaching experience at Acelero, and bilingualism
- Children's learning gains also analyzed by types of curriculum and types of assessment
 - Four curriculums were selected to consider: Acelero, Creative, Curiosity, and TOOLS.
 - The learning gains were assessed by ELS, GOLD, WSS.

□ **The quality analysis on the class**

- Measured by seven point scale on 10 sub sectors to measure teacher-child interaction
 - Three domains: emotional support, classroom organization, instructional support
 - Children participated in Head Start Program showed higher scores than national average regarding all 3 domains. (cf. figure 1)
- Among three delegate agencies, children in Clark County (CC) displayed lowest scores on every domain.
 - They participated more in full day program than children in other delegate agencies
 - In figure 4, the average scores of four parts (instructional, concept, quality of feedback, and language modeling) were highest in CC region and lowest in Camden/Philadelphia (CP) region
 - CC region had a higher rate of experienced teachers (more than five years) and lowest rate of new teachers (less than one year), CP region, on the other hand, showed the opposite.

□ **Learning gains of children**

- In figure 5, children in Acelero program now appeared to show higher scores on PPVT vocabulary test and WJ-Math math test than children experienced Acelero program in 2010.
 - It can be explained by accumulated learning experience effect. It is possible that children could get higher score because of accumulated years of experience on the program.
- The differences in scores on both tests can be from that CC employs half day program more.

□ **Findings from multi-level regression analysis (hierarchical multiple regression)**

- Teacher characteristics (teacher education, teaching years) and/or length of day (full-day, half-day) failed to explain learning gains significantly.
- Among teacher characteristics, teacher's bilingualism was the only significant factor that explained
- Hispanic children and children using Spanish had impacts on learning gains.
- Center size (CC) and program participation rate (MM) had significant relationship in partial.

□ **It reported that children with Acelero Head Start had higher scores than with TOOLS.**

- Children with TOOLS had lowest scores among four programs
- Fewest numbers of children took TOOLS program among four programs
- It appeared that the scores from the other two programs, Creativity and Curiosity, was higher than Acelero program (cf. figure 18, 19, 20, 21).