Connecticut’s Fall Kindergarten Inventory: Policy and Technical Issues

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Goals

- Examine the relationship between the legal mandate and policy questions about kindergarten readiness and state preschool programs
- Describe the assessment development and implementation process
- Discuss the technical issues and current research
- Provide an opportunity for discussion
Part I:

Early Childhood Accountability and Assessment

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Accountability Trickles Down to Early Childhood

- State invests in providing preschool to young children and targets those most at risk
- CT invests ~$80,000,000 per year since 2000
- Programs promote school readiness and closing the achievement gap
- Achievement gaps remain stubbornly intact
Why does Connecticut have a Fall Kindergarten Entrance Inventory?

- Legislators wanted to know if the preschool programs they are funding are effective (Are children ready for kindergarten?)
- CT Legislature began to implement the Results-Based Accountability (RBA) process to look at statewide trends and program performance (Number of children ready for kindergarten was a population indicator)

Statutory Mandate for a Kindergarten Assessment

- The 2007 Legislation required that: “(h) Within available appropriations, the Commissioner of Education shall, not later than October 1, 2007, develop and implement a state-wide developmentally appropriate kindergarten assessment tool that measures a child’s preparedness for kindergarten, but shall not be used as a measurement tool for program accountability pursuant to section 10-16s, as amended by the act.”
Early Development Questions

- Direct assessments of young children are limited and expensive (unfunded mandate).
- Evaluation of all facets of early childhood, not just the cognitive skills (the whole child).
- Information on behavioral skills, in particular, can only be provided by the child’s teacher.
- How many items (domain-level vs. item-level)?

Fall Kindergarten Entrance Inventory Development

- This instrument was designed to provide a statewide snapshot of the skills and behaviors students demonstrate, based on teachers’ observations, at the beginning of the kindergarten year (mid-October).

- The Fall Inventory covers six domains of early childhood development, as recommended by early childhood experts.

- Each domain is defined by a series of indicators.
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Fall Kindergarten Entrance Inventory
Development

- The indicators on the Inventory reflect the state curriculum framework and the standards for the beginning of the kindergarten year.

- A committee of preschool and kindergarten teachers reviewed the indicators and provided the Department of Education with recommendations on their appropriateness.

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What is the Purpose of the
Fall Kindergarten Entrance Inventory?

- The Fall Kindergarten Entrance Inventory was developed to provide kindergarten teachers, administrators and other stakeholders with aggregated information about the level of skills and behaviors that students exhibit at the beginning of kindergarten.
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Fall Kindergarten Entrance Inventory Instrument

- Includes Six Domains of Early Childhood Development
  - Language Skills
  - Literacy Skills
  - Numeracy Skills
  - Physical/Motor Skills
  - Creative/Aesthetic Skills
  - Personal/Social Skills

Fall Kindergarten Entrance Inventory - CSDE Website

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How will the Results of the Fall Kindergarten Entrance Inventory be used?

- The Inventory results will be used to describe kindergarten students across the state using a standardized approach.
- The results will be aggregated to the district and state levels, grouping students into three performance levels by domain.
- Statewide results were presented by the Early Childhood Cabinet to the CT Legislature in 2007 and 2008 as an indicator of “Entry to Kindergarten Readiness”.
### 2009 Fall Kindergarten Inventory Results

<table>
<thead>
<tr>
<th>Domain</th>
<th>PL1</th>
<th>PL2</th>
<th>PL3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>22%</td>
<td>41%</td>
<td>37%</td>
</tr>
<tr>
<td>Literacy</td>
<td>24%</td>
<td>41%</td>
<td>35%</td>
</tr>
<tr>
<td>Numeracy</td>
<td>19%</td>
<td>43%</td>
<td>38%</td>
</tr>
<tr>
<td>Physical</td>
<td>11%</td>
<td>42%</td>
<td>47%</td>
</tr>
<tr>
<td>Creative</td>
<td>11%</td>
<td>42%</td>
<td>47%</td>
</tr>
<tr>
<td>Personal</td>
<td>16%</td>
<td>43%</td>
<td>41%</td>
</tr>
</tbody>
</table>

### 2007 - 2009 Fall Kindergarten Inventory Results

<table>
<thead>
<tr>
<th>Results</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL1</td>
<td>25%</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>PL2</td>
<td>40%</td>
<td>40%</td>
<td>41%</td>
</tr>
<tr>
<td>PL3</td>
<td>35%</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td>Numeracy Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL1</td>
<td>24%</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>PL2</td>
<td>44%</td>
<td>44%</td>
<td>43%</td>
</tr>
<tr>
<td>PL3</td>
<td>32%</td>
<td>36%</td>
<td>38%</td>
</tr>
<tr>
<td>Personal/Social Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL1</td>
<td>19%</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td>PL2</td>
<td>43%</td>
<td>43%</td>
<td>43%</td>
</tr>
<tr>
<td>PL3</td>
<td>38%</td>
<td>40%</td>
<td>41%</td>
</tr>
</tbody>
</table>
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Domain Means by Gender

2009 Fall Kindergarten Inventory Results

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Domain Means by Free Lunch Status

2009 Fall Kindergarten Inventory Results
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Part II: Validating the Kindergarten Entrance Inventory

A Joint UConn/CSDE Research Effort
Validity in Practice

Validity is the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests.
Validity evidence

1. Test content
   - Does the test content match the curriculum?
2. Response processes
   - How do teachers evaluate and judge students’ skills and behaviors?
   - How do students process the test questions?
3. Internal structure
   - Do the data match our expectations for test functionality? (Quantitative analyses)
4. Relations to other variables
   - Are scores consistent with scores on similar assessments?
5. Test consequences
   - Are the intended benefits of the assessment being realized?

How does this work?

1. What is the stated purpose of the assessment?
2. What is assumed within that purpose?
3. What evidence already exists?
4. What evidence must be created?
5. How well does the evidence support the interpretations and uses of the test scores for their stated purpose(s)?
Purpose of the Inventory

The Fall Kindergarten Entrance Inventory was developed to provide kindergarten teachers, administrators and other stakeholders with aggregated information about the level of skills and behaviors that students exhibit at the beginning of kindergarten.

Assumptions and Evidence/TEST CONTENT

- Assumption:
  - The Inventory content reflects the Preschool Assessment Framework.
  - The Inventory reflects the skills students should demonstrate at the beginning of the kindergarten year.

- Evidence:
  - Documentation of procedures used to develop the Inventory
  - Review of the literature
  - Alignment study
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**Assumptions and Evidence/RESPONSE PROCESSES**

**Assumptions**
- Teachers understand the rating scale.
- Teachers interpret the domains accurately.
- Teachers have assessed their students’ skills and abilities across the domains by October.
- Teachers assign ratings that reflect students’ skills and abilities.
- Teachers use the Inventory consistently within their classrooms.
- Teachers use the Inventory consistently across schools.

**Evidence: Ask the teachers!**
- Fall teacher surveys
- Teacher focus groups
- Think-aloud studies
- Inter-rater reliability studies
- Teacher training workshops and online documentation
### Connecticut SDE Assumptions and Evidence/INTERNAL STRUCTURE

- **Assumptions**
  - Relationships among the test components conform to the construct the test is intended to measure.
- **Evidence**
  - Descriptive test data by gender, race/ethnicity, lunch status, special education status, English language learner status, student age
  - Dimensionality
  - Differential item functioning
  - Internal consistency measures

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### Connecticut SDE Assumptions and Evidence/RELATIONS TO OTHER VARIABLES

- **Assumptions**
  - The Inventory measures kindergarten students’ skills in a manner that is similar to other measures.
- **Evidence**
  - Correlation to scores from other standardized measures of early literacy/numeracy
  - Inventory as a predictor of kindergarten retention
  - Patterns of Inventory data and patterns of CMT scores across the state
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Assumptions and Evidence/
TEST CONSEQUENCES

- Assumptions
  - Data from the Inventory is used in the aggregate to better understand the skills and behaviors that students exhibit at the beginning of kindergarten.
  - The Inventory is not used to evaluate individual students.
  - The Inventory is not used to evaluate preschool or kindergarten programs.
- Evidence
  - Surveys
  - Focus groups

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District Data Study

- Indicator level data collection
- 1,670 incoming kindergarten students
- Exploratory factor analysis
  - Does a structure exist within the data set?
- Confirmatory factor analysis
  - Does the identified factor structure fit the data?
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**Exploratory factor analysis**

- Academic readiness
  - All Literacy items
  - All Numeracy items
  - 4 of 6 Language items
- Social readiness
  - All Personal/Social items
  - Language items: Communicates feelings and needs/ Listens attentively to a speaker
- Readiness for activities
  - All Physical/Motor items
  - All Creative/Aesthetic items

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**Confirmatory factor analysis**

- There are groups of items within each domain
  - Language: speaking, listening, retelling a story
  - Literacy: books, letters, emergent writing
  - Numeracy: counting, shapes/patterns, sequencing
  - Physical/Motor: gross motor, fine motor
  - Personal/Social: expressing oneself, following routines and working with others
  - Creative/Aesthetic
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Questions/Comments/Concerns

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Link to Conference Videos and Materials

- The following web address, housed at UCONN, contains videos and session materials from the Assessment Forum:
  http://www.education.uconn.edu/assessment/conferences.cfm