Child Care Quality and Child Outcome
Multiple-Studies Analyses

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Peg Burchinal, Kirsten Kainz, Karen Cai
FPG Child Development Institute, UNC

Kathryn Tout, Marty Zaslow
Child Trends

Ivelisse Martinez-Beck, OPRE
Colleen Rathgeb, OHS
Overview

• Research suggests quality child care improves academic and social skills, but associations may be modest

• Examine this questions with
  – Meta analysis of studies of child care quality and child outcomes
  – Secondary data analysis of studies with large numbers of low-income children
Background

• Relatively consistent research finding:
  – Stronger language, academic, and social outcomes in higher quality child care classrooms
  – In experimental and observational studies and large and small studies

• This finding is the basis for many early childhood policies
  – Quality rating systems
  – Tiered reimbursement for subsidies
  – Quality enhancement programs
  – Public Pre-Kindergarten/Head Start
Background

- Call to examine research basis
  - Early intervention experimental programs produced large effects
    - Abecedarian: $d = 1.23$ – IQ at 3 years
    - High Scope: $d = 1.03$ – IQ at 5 years
    - IHDP: $d = .83$ – IQ at 3 years
  - Larger observational studies produced much smaller associations between widely used measures of classroom quality and child outcomes
    - NICHD SECCYD: $d = .26$ Language at 5.4 years
    - CQO: $d = .20$ Language 4.5 years
    - Tulsa Pre-K evaluation: $d = .33$ language at 5-6 years
Goal

• Our goal – Query existing research to answer 4 questions
  – How large is the association between measured quality and child outcomes based on all published research?
  – How large is that association for low-income children and is it stronger when aligned quality-outcome measures?
  – Is there evidence of thresholds in those associations for low-income children?
  – For the most popular quality measures, do some items predict child outcomes better than other items?
Strategies

1. Meta-analysis of studies published in journals or in evaluation reports on the web
2. Secondary analysis of data from large child care studies involving low-income children
   – Combine findings across studies
   – Look for threshold effects
   – Examine items on ECERS & CLASS
Meta Analysis

• 20 studies identified with
  – Reported associations between widely used measures of child care quality and child outcomes
  – More than 10 classrooms
  – Published in a journal or online in an evaluation report (presumably some sort of peer review)
  – Multiple reports per study were included

• 97 effect sizes in the 20 studies
data

- AUTHOR, YEAR
- MODELING TECHNIQUE
- QUALITY MEASURES
- COGNITIVE OUTCOMES REPORTED
- STATISTICS
- COVARIATES:
  - STAND REG COEFFICIENT (with controls):
  - REG COEFFICIENT (with controls), se, df if available
  - P value (with controls)
  - Partial correlation
  - Adjusted means and Square-root of MS error, or effect size d
  - N per group COEFFICIENT without controls:
  - bivariate correlation
  - N
• Author: McCartney, 1994
• MODELING TECHNIQUE: Multiple Regression
• QUALITY MEASURES: ECERS
• COGNITIVE OUTCOMES REPORTED: Language - PPVT, PLS, ALI
• STATISTICS: standardized regression coefficients, correlations
• COVARIATES: family background, home environment, parenting values
• STAND REG COEFFICIENT(with controls): \( B = 0.19 \) (PPVT), 0.23 (PLS), 0.43 (ALI)
• REG COEFFICIENT (with controls), se, df if available
• P value (with controls)
• Partial correlation
• Adjusted means and Square-root of MS error, or effect size \( d \),
• N per group COEFFICIENT without controls:
• bivariate correlation: \( r = 0.23 \) (PPVT), 0.23 (PLS), 0.35 (ALI)
• N : \( n = 131 \) (PPVT), 131 (PLS), 124 (ALI)
Meta Analysis: Mean Partial Correlations and Confidence Intervals
## Meta Analysis: Mean Partial Correlations and Confidence Intervals

<table>
<thead>
<tr>
<th></th>
<th>all ages</th>
<th>2 year olds</th>
<th>3 year olds</th>
<th>4 year olds</th>
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<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>.109</td>
<td>.111</td>
<td>.135</td>
<td>.081</td>
</tr>
<tr>
<td></td>
<td>(.098-.120)</td>
<td>(.099-.122)</td>
<td>(.121-.149)</td>
<td>(.072-.089)</td>
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<tr>
<td><strong>Academic/Cog</strong></td>
<td>.120</td>
<td>.119</td>
<td>.156</td>
<td>.085</td>
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<tr>
<td></td>
<td>(.101-.139)</td>
<td>(.100-.138)</td>
<td>(.131-.180)</td>
<td>(.072-.098)</td>
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<tr>
<td><strong>Language</strong></td>
<td>.144</td>
<td></td>
<td>.166</td>
<td>.122</td>
</tr>
<tr>
<td></td>
<td>(.094-.194)</td>
<td></td>
<td>(.118-.214)</td>
<td>(.087-.158)</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>.085</td>
<td>.100</td>
<td>.101</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>(.069-.101)</td>
<td>(.081-.119)</td>
<td>(.084-.123)</td>
<td>(.042-.061)</td>
</tr>
</tbody>
</table>
Summary

- Modest associations, albeit highly statistically significant
  - Somewhat larger associations for younger children than older children
  - Somewhat larger associations for academic and language skills than for social skills
Secondary Data Analysis

• Child Care Quality and Child Outcomes for Low-Income Children

• Studies
  – NICHD Study of Early Child Care and Youth Development
  – Cost, Quality, and Outcomes Study
  – NCEDL 11 state Pre-Kindergarten Evaluation
  – Head Start Family and Child Experiences Survey
    – FACES 1997
    – FACES 2000
<table>
<thead>
<tr>
<th></th>
<th>SECCYD N=129</th>
<th>CQO N=140</th>
<th>NCEDL N=1465</th>
<th>FACES97 N=1493</th>
<th>FACES00 n=1739</th>
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<tbody>
<tr>
<td>Male</td>
<td>%</td>
<td>48%</td>
<td>51%</td>
<td>49%</td>
<td>51%</td>
</tr>
<tr>
<td>Child Age - m</td>
<td>M (sd)</td>
<td>54</td>
<td>51.1 (4.4)</td>
<td>60.6 (2.3)</td>
<td>55.4 (6.3)</td>
</tr>
<tr>
<td>Education M (sd)</td>
<td>12.6 (1.8)</td>
<td>13.0 (1.7)</td>
<td>11.8 (1.9)</td>
<td>11.7 (1.9)</td>
<td>11.9 (1.8)</td>
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<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AfricanAm</td>
<td>%</td>
<td>36%</td>
<td>38%</td>
<td>36%</td>
<td>21%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>%</td>
<td>9%</td>
<td>29%</td>
<td>9%</td>
<td>36%</td>
</tr>
<tr>
<td>White</td>
<td>%</td>
<td>50%</td>
<td>24%</td>
<td>50%</td>
<td>29%</td>
</tr>
<tr>
<td>Other</td>
<td>%</td>
<td>5%</td>
<td>9%</td>
<td>5%</td>
<td>14%</td>
</tr>
</tbody>
</table>
Question 2

• How large is the association child care quality and child outcomes for low-income children?
  – Is there any evidence it is stronger with “aligned” measures

• Correlations were computed to describe extent to which higher quality scores predicted higher child outcomes scores
  – Adjusted for maternal education, ethnicity, and site
Secondary data analysis-
Low Income 4-5 Year-Old Children:
Overall and Specific Quality Measures

Correlations Adjusted for maternal education, ethnicity, and site
Associations between Aligned Quality and Language Outcomes
Associations between Aligned Quality and Reading Outcomes
Associations between Aligned Quality and Social Skills
Associations between Aligned Quality and Behavior Problems

![Bar Chart: Associations between Aligned Quality and Behavior Problems](chart.png)

- **CQO**
- **NCEDL**
- **FACES 1997**
- **FACES 2000**
- **MTP**

**Legend:**
- **ECERS Interaction**
- **CLASS Emotional**
Summary

• Very modest associations for low-income children also – even more modest than in meta-analysis

• Some evidence that measures of the classroom thought to be more closely linked to child outcomes showed stronger associations (although still rather modest)
Question 3

• Is there evidence of nonlinear associations between child care quality and child outcomes
  – Evidence of good enough care: association between quality and outcomes is steeper at lower end of quality
  – Evidence that higher quality is necessary: association between quality and outcomes is steeper at higher end of quality
Nonlinear Associations

FACES 97  ECERS and language

PPVT

4.5  4.622  4.744  4.866  4.988  5.11  5.232  5.354  5.476  5.598  5.72

ECERS Total
Summary

• Growing evidence of nonlinear associations
  – Quality related to child outcomes only when quality is relatively high
  – Caution: Evidence is not obtained in all analyses – but is suggestive
Question 4

• Background: Some states are using widely used quality measures as part of their quality enhancement programs
  – Providers conduct a self study and then select items to work on improving
• Therefore, looking at associations for items can help guide the choice of items on which to focus
Individual Items and Child Outcomes

• ECERS-R (37 items)
  – 2 large project, NCEDL 11 state Pre-K evaluation and Cost, Quality, and Child Outcomes Study
  – Items with strongest correlations with language, academic or social outcomes
    • Interaction items (e.g., staff-child interactions)
    • Program structure items (e.g., free play or group time)
  – Items with the weakest correlations
    • Activity items
    • Personal Care items
Individual Items and Child Outcomes

• CLASS (9 items)
  – 1 large project, NCEDL 11 state Pre-K evaluation
  – Items with strongest correlations with language, academic or social outcomes
    • Negative climate
    • Positive climate
    • Productivity (Language and academics outcomes)
    • Behavior Management (Behavioral outcomes)
  – Items with the weakest correlations
    • Learning Formats
    • Instructional items (Social/Behavioral outcomes)
Summary

• Stronger associations for items looking at teacher-child interactions

• The whole scales provide better prediction – use of individual items for assessing quality is NOT recommended
Conclusions

• Higher quality child care is associated with higher language, academic, and social skills and fewer behavior problems
• **BUT** associations are quite modest
• Two explanations
  – True association is modest
  – Measurement issues constrain estimation of associations
Conclusions

• Measurement
  – Most preschool child outcomes have good reliability and validity, especially standardized tests
  – Most quality measures
    • Are global
    • Were developed conceptually
    • Have good reliability
    • Some validity
      – Relate to child outcomes
      – New studies appear to indicate that scale-based quality enhancement may improve quality and child outcomes
Conclusions

• Measurement
  – May need more specific and aligned measures
  – Quality measures need more psychometric development
    • Wider set of items
    • Item response theory
Implications

• Scale scores from widely-used quality measures still provide the best prediction of child outcomes.
  – Much better than structural measures such as teacher education or adult-child ratios
  – Much better than individual items
• Hopefully, they will provide better prediction with further psychometric development