The Determinants of Interaction Quality in Australian Child Care: A Production-Function Approach

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Presentation Overview

1. Caveats
2. E4Kids study overview – especially the CLASS
3. Why and how to study the determinants of quality
4. Institutional, director, teacher and child variables
5. Taking variables one-by-one
6. Taking variables in groups
7. All together?
8. Some ideas and further questions
This work is preliminary.

- No final specification yet
- Missing data still being updated
- No weighting yet for special features of study design
- No weighting yet for systematic non-response
- No checking of results against 2010 and 2011 (cycle 2)
Research design:

- 5 year longitudinal study of 2,653 children (3-4 years old)
- Parent surveys about family and child
- Teacher/educator surveys about characteristics of teachers in classrooms
- Director/Principal surveys about characteristics of service and director/principal
- Baseline and regular updates on child abilities (WJIII etc.)
- On-site detailed evaluation of interaction quality (CLASS, ECERS-R)
- No-program control sample
Remote: Mount Isa
ECEC kids 167, NPC kids 10
2011- Services 11,
Rooms 39

Greater Metro: Brisbane
ECEC kids 961, NPC kids 62
2011- Services 122,
Rooms 179

Regional: Shepparton
ECEC kids 336, NPC kids 16
2011- Services 32, Rooms 89

Greater Metro: Melbourne
ECEC kids 1028, NPC kids 71
2011- Services 189,
Rooms 327
Our Sample

• The sample used has about 450 classrooms in long day care and kindergartens
• On-site quality evaluations were done in early 2011 and other data were collected by survey
• Regressions control for the clustering of rooms within services; standard errors are adjusted
Measures in E4Kids

♦ CHILD ASSESSMENT
  Height, weight, waist
  Cognition & Achievement: WJ-III
  Friendships/social inclusion: Bus story

♦ PROGRAM ASSESSMENT
  Pedagogy: CLASS
  Other characteristics: ECERS-R, 3 subscales

♦ QUESTIONNAIRE
  Parent: ECEC program history/access; child behaviour, social skills; parenting style; home learning environment

♦ QUESTIONNAIRE
  Director/Principal: structural aspects
  Educator/Teacher: child behaviour, structural aspects

♦ DATA LINKAGE
  NAPLAN
Process quality measured by CLASS

<table>
<thead>
<tr>
<th>Emotional Support</th>
<th>Class Organization</th>
<th>Instructional Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Positive Climate</td>
<td>• Behavior Management</td>
<td>• Concept Development</td>
</tr>
<tr>
<td>• Negative Climate</td>
<td>• Productivity</td>
<td>• Quality of Feedback</td>
</tr>
<tr>
<td>• Teacher Sensitivity</td>
<td>• Instructional Learning Formats</td>
<td>• Language Modeling</td>
</tr>
<tr>
<td>• Regard for Child Perspectives</td>
<td></td>
<td>• Literacy focus</td>
</tr>
</tbody>
</table>

• Pianta, Hamre et. al., 2009
Emotional Climate

Room or group type

K, LDC, K3YO
Classroom Organisation

![Box plot showing classroom organisation for different room or group types: K, LDC, K3YO.](image)
Instructional Support

[Box plot image showing the distribution of Instructional Support (no LF) for different room or group types: K, LDC, K3YO. The box plot illustrates the median, interquartile range, and outliers for each group.]
How quality is determined

• We assume that “level of quality” is a deliberate choice of the ECEC service
• A mix of particular inputs is chosen to produce quality as an output
• Quality is expensive. Parents choose different combinations of quality and cost. Different centres/services choose different levels of quality and use different mixes of inputs
• Regulations constrain choices of input mix
Possible determinants

• CLASS is measured at the classroom level
• Teacher characteristics can affect quality (education, ECEC training, experience, etc.)
• Director characteristics can affect quality (education, experience, etc.)
• Institutional characteristics can affect quality (type of service, auspice, location, etc.)
• Child characteristics can affect quality (number of children, ages, disability, knowledge of English, socioeconomic status, etc.)
Methods

• We rely on a large literature suggesting potential quality-affecting factors
• OLS regressions of Emotional Support, Classroom Organization and Instructional Support on potential determinants taken one-by-one
• OLS on groups of potentially quality-affecting determinants
• We put all determinants in the same regression but results are unsatisfactory
• Discussion of next steps in this investigation
<table>
<thead>
<tr>
<th></th>
<th>Emotional</th>
<th>Class Org</th>
<th>Instructional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melbourne (Brisbane omitted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hume</td>
<td></td>
<td></td>
<td>- ***</td>
</tr>
<tr>
<td>Mount Isa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For-profit (community non-profit omitted)</td>
<td></td>
<td>- **</td>
<td></td>
</tr>
<tr>
<td>Gov’t-managed</td>
<td></td>
<td></td>
<td>- **</td>
</tr>
<tr>
<td>School-managed</td>
<td></td>
<td></td>
<td>- *</td>
</tr>
<tr>
<td>Standalone K (LDC omitted)</td>
<td>+ ***</td>
<td>+ ***</td>
<td>+ ***</td>
</tr>
<tr>
<td>Standalone K3YO</td>
<td>+ ***</td>
<td>+ ***</td>
<td>+ *</td>
</tr>
<tr>
<td>K in LDC</td>
<td>+ **</td>
<td>+ **</td>
<td>+ **</td>
</tr>
</tbody>
</table>
# Director Variables: Effects on CLASS taken one-by-one

<table>
<thead>
<tr>
<th></th>
<th>Emotional</th>
<th>Class Org</th>
<th>Instructional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director Bachelor (no university omitted)</td>
<td>+ **</td>
<td>+ **</td>
<td>+ *</td>
</tr>
<tr>
<td>Director Post-graduate</td>
<td>+ ***</td>
<td>+ **</td>
<td>+ **</td>
</tr>
<tr>
<td>Director has university ECEC qualification</td>
<td>+ **</td>
<td></td>
<td>+ *</td>
</tr>
<tr>
<td>Director recent professional development</td>
<td></td>
<td>+ *</td>
<td>+ **</td>
</tr>
<tr>
<td>Director – years experience in service</td>
<td></td>
<td>+ **</td>
<td>+ **</td>
</tr>
<tr>
<td>Director born Oz</td>
<td>+ *</td>
<td>+ **</td>
<td>+ *</td>
</tr>
<tr>
<td>Director first language English</td>
<td></td>
<td>+ ***</td>
<td>+ **</td>
</tr>
</tbody>
</table>
### Teacher Variables:
Effects on CLASS taken one-by-one

<table>
<thead>
<tr>
<th>Variable</th>
<th>Emotional</th>
<th>Class Org</th>
<th>Instructional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching director (teacher omitted)</td>
<td>+ ***</td>
<td>+ **</td>
<td>+ ***</td>
</tr>
<tr>
<td>Lead teacher</td>
<td>+ **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T_bachelor</td>
<td>+ **</td>
<td></td>
<td>+ **</td>
</tr>
<tr>
<td>T_post-grad</td>
<td>+ **</td>
<td></td>
<td>+ **</td>
</tr>
<tr>
<td>T_ECEC qual</td>
<td></td>
<td></td>
<td>+ **</td>
</tr>
<tr>
<td>T_usual work hours</td>
<td></td>
<td></td>
<td>+ **</td>
</tr>
<tr>
<td>T_years exp in this service</td>
<td>+ ***</td>
<td>+ ***</td>
<td></td>
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<tr>
<td>T_Aboutinial/TSI</td>
<td></td>
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<td>- ***</td>
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<tr>
<td>TBorn Oz</td>
<td></td>
<td></td>
<td>+ ***</td>
</tr>
<tr>
<td>T_English</td>
<td>+ **</td>
<td>+ *</td>
<td>+ ***</td>
</tr>
</tbody>
</table>

**Note:** The symbols (+, **, ***), **(-)** indicate the level of effect.
Child Variables: Effects on CLASS taken one-by-one

<table>
<thead>
<tr>
<th></th>
<th>Emotional</th>
<th>Class Org</th>
<th>Instructional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEIFA adv and disadv 2006</td>
<td>+ **</td>
<td>+ ***</td>
<td>+ ***</td>
</tr>
<tr>
<td>“average” age</td>
<td>+ **</td>
<td>+ ***</td>
<td>+ **</td>
</tr>
<tr>
<td>Children per week</td>
<td>- ***</td>
<td>- ***</td>
<td>- ***</td>
</tr>
<tr>
<td>Maximum Room Count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kids with diagnosed needs</td>
<td>+ ***</td>
<td>+ **</td>
<td></td>
</tr>
<tr>
<td>Additional staff resources</td>
<td>+ ***</td>
<td>+ *</td>
<td></td>
</tr>
<tr>
<td>Schedule-timetable</td>
<td></td>
<td>- *</td>
<td></td>
</tr>
<tr>
<td>Kids Aboriginal/TSI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kids non English</td>
<td></td>
<td></td>
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</tbody>
</table>
How groups of variables help explain Instructional Support scores

• In turn, we take groups of variables – institutional, director, teacher, child
• We regress Instructional Support scores against each of these groups of variables
• The following slides present regression results in visual form
Effects of institutional factors on instructional support
Effects of director characteristics on instructional support

- Director experience in ECEC: 0.02
- Director had professional development: 0.26
- Director has post-grad degree: 0.36
- Director has bachelors degree: 0.18

Change in Instructional Support

Change in Instructional Support
Effects of teacher characteristics on instructional support

- Teacher main language is English: 0.26
- Teacher Aboriginal or Torres Strait Islander: -0.65
- Teacher years of experience: 0.00
- Teacher has post-grad degree: 0.33
- Teacher has bachelors degree: 0.22
- Lead Teacher: 0.04
- Teaching Director: 0.31
Effects of child characteristics on instructional support

- Classroom receives additional resources
- Children with diagnosed additional needs
- Children per week
- Average age in classroom
- Socioeconomic Status (SEIFA)
Now, all together

• Taking most of these variables together allows us to look at the effects of each variable when all are taken together

• However, it is apparent there is too much collinearity for this size of sample and few variables are statistically significant

• Back to the drawing board to see if alternative specifications can reveal what we think is happening below the surface
Effects of a wide range of potential determinants on instructional support
Key “findings” from analysis so far

• Type of service and SEIFA code have strong, persistent effects on quality
• Most director and teacher variables and the age of children in the classroom appear to affect the provision of quality
• However, many variables are not statistically significant when all are included
Where to go from here

• Take different types of service separately
• Reduce missing data
• Check against 2010 and 2011(2)
• Use ECERS-R as alternative or complementary measure of quality
• Reduce explanatory variables to core – combine variables if possible
• Control for differences in financial capability of services
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Department of Education, Training and Employment (DETE, QLD)
Extra Slides

• Extra slides follow this one
Effects of institutional factors on classroom organization

- Kindergarten in LDC: 0.26
- Standalone 3YO Kindergarten: 0.09
- Standalone Kindergarten: 0.67
- Service is school-managed: 0.04
- Service is govt-managed: -0.33
- Service is for-profit: -0.38
Effects of director characteristics on classroom organization
Effects of teacher characteristics on classroom organization

- Teacher main language is English
- Teacher Aboriginal or Torres Strait Islander
- Teacher years of experience *
- Teacher has post-grad degree
- Teacher has bachelors degree
- Lead Teacher
- Teaching Director

Change in Classroom Organisation
Effects of child characteristics on classroom organization
Effects of a wide range of potential determinants on classroom organization
Effects of institutional factors on emotional support
Effects of director characteristics on emotional support
Effects of teacher characteristics on emotional support
Effects of child characteristics on emotional support

- Classroom receives additional resources: 0.43
- Children with diagnosed additional needs: 0.09
- Children per week: 0.32
- Average age in classroom: 0.10
- Socioeconomic Status (SEIFA): 0.17
Effects of a wide range of potential determinants on emotional support.