

## Longitudinal Associations between Kindergarten Classroom Interactions and Finnish Children's Reading Skills

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### Theoretical background

- Growing interest in the effectiveness of early childhood education
- While there is evidence of short-term academic benefits of early childhood education or preschool programs, findings on the persistence of beneficial preschool effects are mixed (e.g., Barnett & Hustedt, 2005; Gilliam & Zigler, 2001; Gorey, 2001, for meta-analysis; Magnuson et al., 2007).
- Structural characteristics and process quality
- The most important aspects of quality in preschool education are stimulating and supportive interactions between teachers and children (Mashburn et al., 2008; Yoshiwaka et al., 2013)
- The quality of teacher-child interactions has been shown to contribute to the development of children's academic skills in early childhood, particularly to the development of literacy skills (Hamre et al., 2014; Mashburn et al., 2008; Pianta et al., 2008).

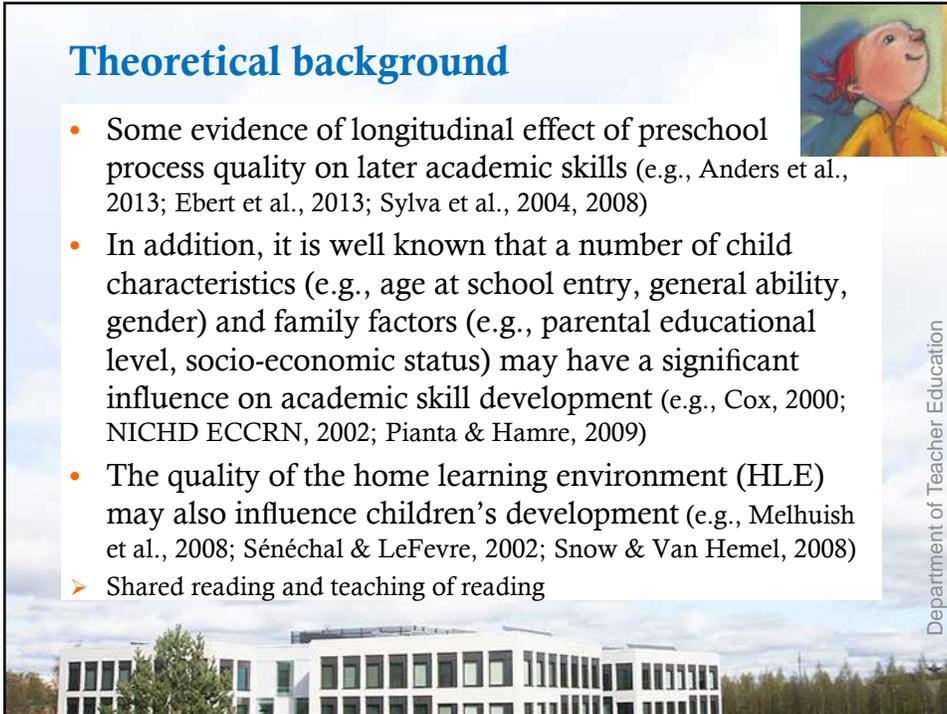


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## Theoretical background

- Some evidence of longitudinal effect of preschool process quality on later academic skills (e.g., Anders et al., 2013; Ebert et al., 2013; Sylva et al., 2004, 2008)
- In addition, it is well known that a number of child characteristics (e.g., age at school entry, general ability, gender) and family factors (e.g., parental educational level, socio-economic status) may have a significant influence on academic skill development (e.g., Cox, 2000; NICHD ECCRN, 2002; Pianta & Hamre, 2009)
- The quality of the home learning environment (HLE) may also influence children's development (e.g., Melhuish et al., 2008; Sénéchal & LeFevre, 2002; Snow & Van Hemel, 2008)
- Shared reading and teaching of reading



## Learning to read in Finnish

- High transparency of the Finnish language
- Nearly 30% of children learn to read before starting formal schooling at the age of 7 (Holopainen et al., 2000; Lerkkanen et al., 2004).
- The majority of Finnish-speaking children learn to decode during Grade 1 (Aunola et al., 2002; Seymour et al., 2003).
- However, despite the relatively easy process of learning to read, there are some students who are struggling with reading fluency and reading comprehension.
- Importance of reading skills for further schooling



## Research gap

- Despite of the growing interest in the effectiveness of ECE, relatively little is known about the longitudinal effect of early childhood education on later academic skills outside the US
- Moreover, the role of the process quality (i.e., quality of classroom interactions) in later academic skills have been investigated to a lesser extent than structural features of preschool programs



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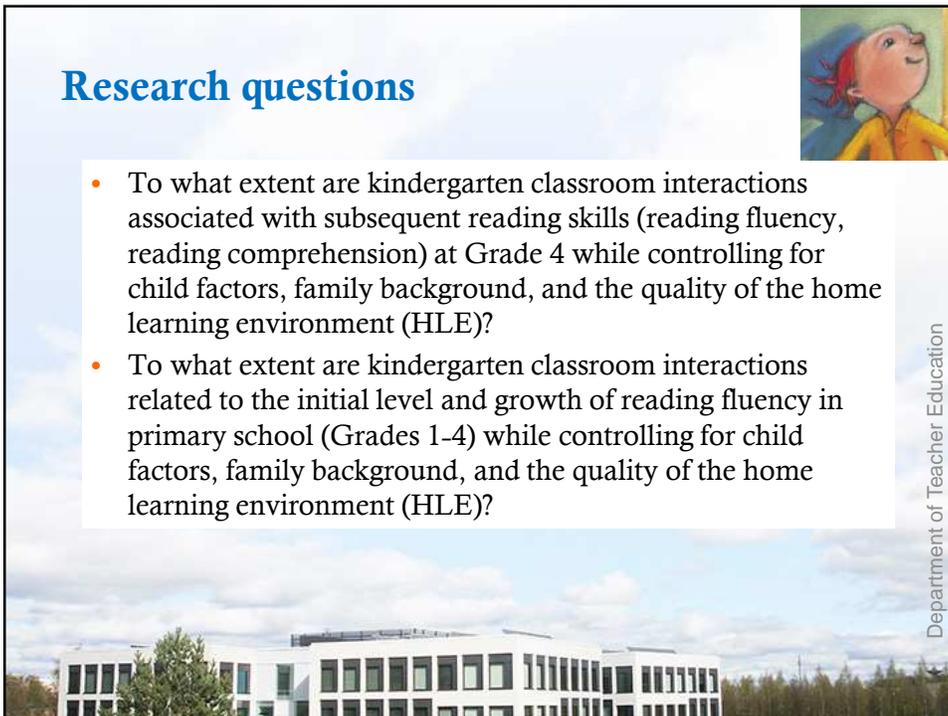


## Research questions

- To what extent are kindergarten classroom interactions associated with subsequent reading skills (reading fluency, reading comprehension) at Grade 4 while controlling for child factors, family background, and the quality of the home learning environment (HLE)?
- To what extent are kindergarten classroom interactions related to the initial level and growth of reading fluency in primary school (Grades 1-4) while controlling for child factors, family background, and the quality of the home learning environment (HLE)?



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## Participants and procedures



- Data were gathered as a part of the longitudinal First Steps –study (Lerkkanen et al., 2006-ongoing)
- 49 kindergarten classrooms were observed (47 female and 2 male teachers) at the end of the kindergarten year
- 515 children (271 boys and 244 girls) (Mean age = 73.58 ( $SD = 3.57$ ) months at the end of Kindergarten) were tested five times: end of Kindergarten, end of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> Grades
- 415 mothers answered to questionnaires regarding the educational background and HLE

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## Measures: Classroom interactions

CLASS Pre-K instrument (Pianta, La Paro & Hamre, 2008).

| 3 DOMAINS | EMOTIONAL SUPPORT | CLASSROOM ORGANIZATION   | INSTRUCTIONAL SUPPORT   |
|-----------|-------------------|--|---|
|           | 10 DIMENSIONS     | Positive Climate<br>Negative Climate<br>Teacher Sensitivity<br>Regard for Student Perspectives | Behavior Management<br>Productivity<br>Instructional Learning Formats |

- Multiple **indicators** define each dimension.
- Multiple **behavioral markers** define each indicator.
- 3 hrs at a time on two different days
- 2 independent observers
- Ratings from 1 (low)-7 (high)

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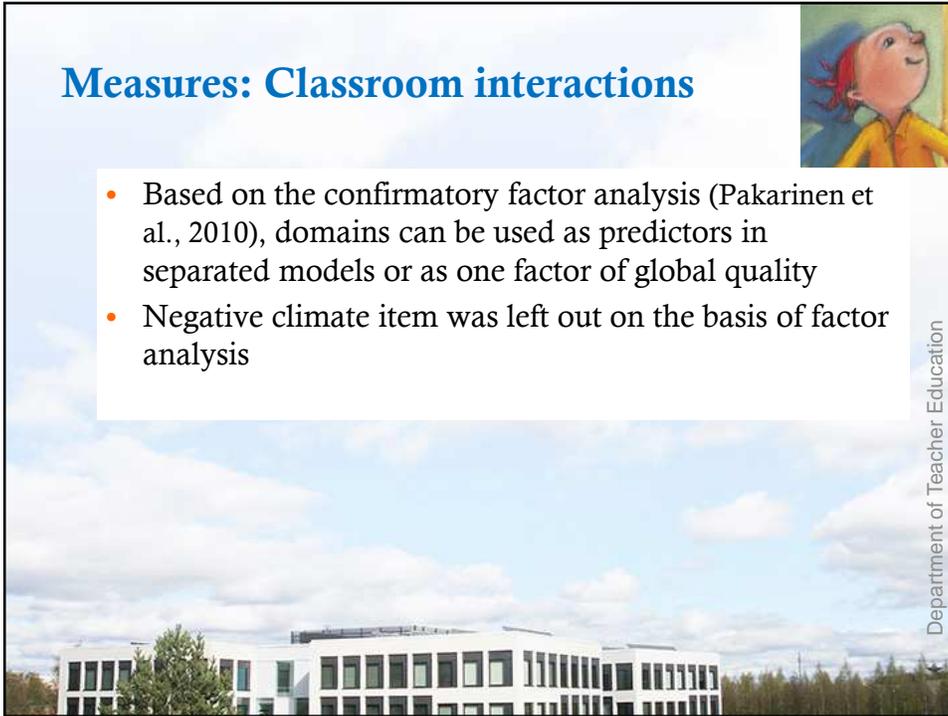


## Measures: Classroom interactions



- Based on the confirmatory factor analysis (Pakarinen et al., 2010), domains can be used as predictors in separated models or as one factor of global quality
- Negative climate item was left out on the basis of factor analysis

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## Measures: Pre-reading skills



- **Pre-reading skills**
  - ✓ *Phonological awareness* in kindergarten. 10 items (ARMI; A tool for assessing reading and writing skills in grade one; Lerkkanen, Poikkeus, & Ketonen, 2006), alpha = .74

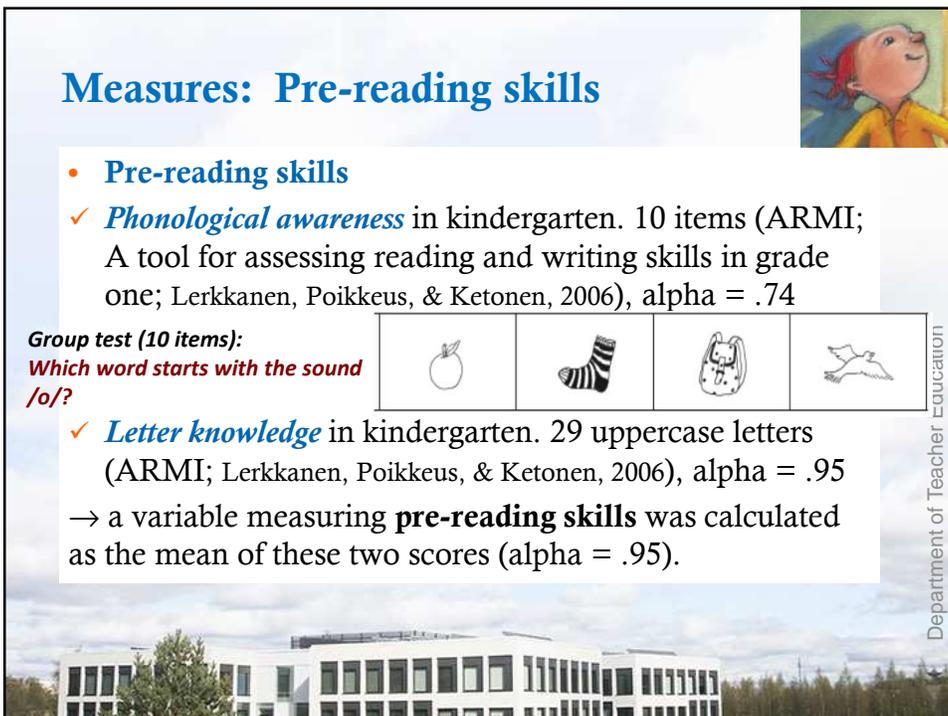
**Group test (10 items):**

*Which word starts with the sound /o/?*



- ✓ *Letter knowledge* in kindergarten. 29 uppercase letters (ARMI; Lerkkanen, Poikkeus, & Ketonen, 2006), alpha = .95  
→ a variable measuring **pre-reading skills** was calculated as the mean of these two scores (alpha = .95).

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## Measures: Reading skills

4.  
sü-de  
sy-dän  
sa-de  
si-de



6.  
suk-set  
sok-set  
syk-sy  
sik-si




### Grades 1-4

- **Reading fluency.** Reading fluency was measured at the end of each Grade with a nationally normed reading test battery (ALLU; Lindeman, 1998). 80 items, 3-minutes time limit, alpha = .95

### Grade 4

- **Reading comprehension.** Reading comprehension was measured with a nationally normed reading test battery (ALLU; Lindeman, 1998). 12 multiple choice questions after reading a factual text, alpha = .76
- **Reading sentences.** Test of Sentence Reading Efficiency and Comprehension (Wagner, Torgesen, Rashotte, & Pearson, 2009). Alpha = .94

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## Measures: Control variables

- **Nonverbal ability** (i.e., non-verbal reasoning) was measured in kindergarten with the spatial relations task from the Woodcock and Johnson (1977) test battery. 31 items, 3-min time limit, alpha = .72
- **Gender**
- **Parental level of education** (1 = *no further qualification after comprehensive school*; 7 = *licentiate or doctoral degree*). The highest parental educational level in the family (mother's or father's) was used in the analyses as a control variable (correlation between father's and mother's education was .69,  $p < .05$ ).

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## Measures: HLE



- **Shared reading.** Mothers were asked to rate one question "How often do you read to your child/read books together with your child?" on a 5-point scale (1 = less than once a week, 2 = 1–3 times a week, 3 = 4–6 times a week, 4 = once a day, and 5 = more than once a day).
- **Maternal teaching of reading** was measured with 2 questions (Sénéchal et al., 1998) "How often do you teach/have previously taught letters to your child?" and "How often do you teach/have previously taught your child to read?" on a 5-point scale (1 = not at all/very rarely to 5 = very often/daily).  $\alpha = .74$ .

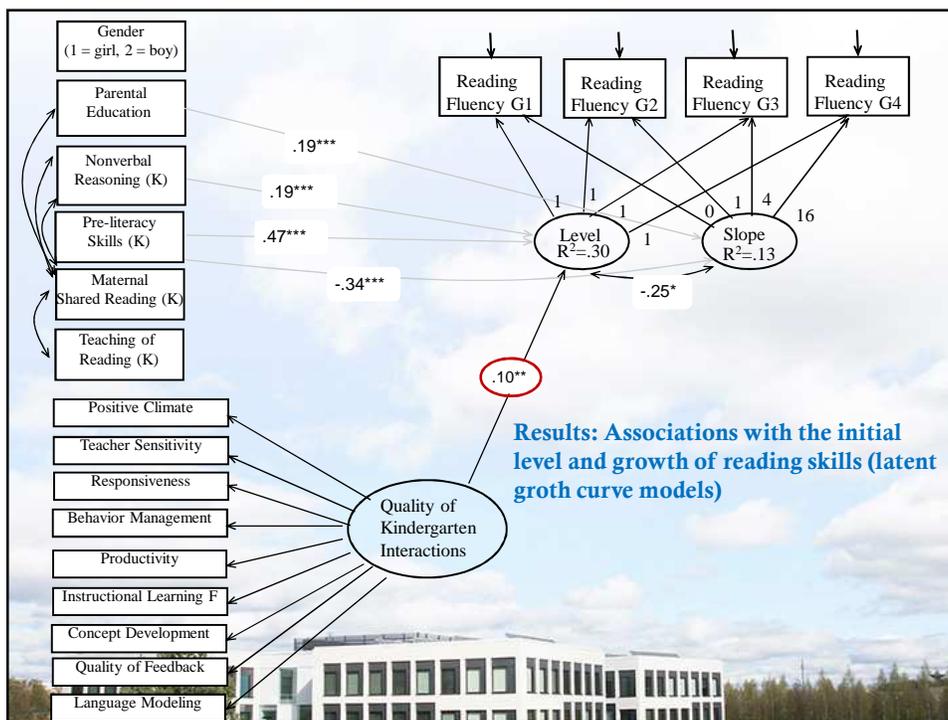
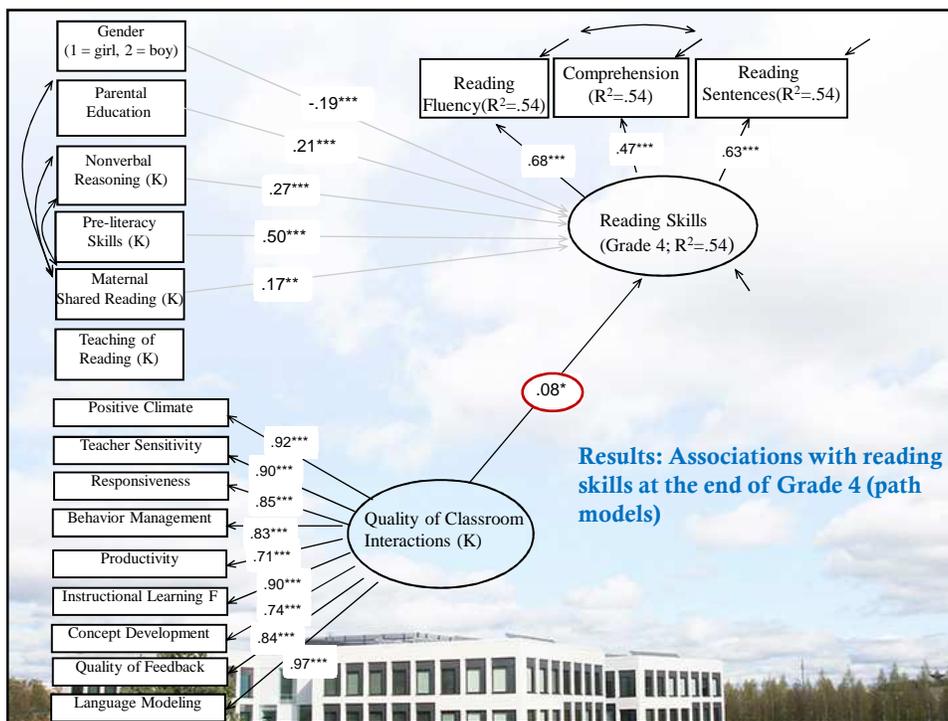
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## Analyses



- RQ1: Path models with Mplus statistical package using a COMPLEX option (Muthén & Muthén, 1998–2008) (corrects for distortions in standard errors in estimates caused by the clustering of observations).
- RQ2: Latent growth curve analyses

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## Discussion

- Although pre-reading skills and other factors played a bigger role, there is a small but significant link from kindergarten process quality to children's reading skills at the end of Grade 4
- The quality of teacher-child interactions in kindergarten seem to be important particularly for the initial level of reading fluency at the beginning of primary school
- What are the mechanisms? Enhancing motivation, working habits and attitudes towards learning?
- We did not measure the effect of primary school teacher and classroom
- No comparison group, so this study cannot be viewed as an evaluation of whether children gain from attending kindergarten education but emphasize the importance of high-quality interactions



## Discussion

- Classroom interactions were operationalized as a global quality (average experience in the classroom) and we were not able to investigate individual experiences of children or individualized instruction
- We did not focus only on reading-related instruction
- Further studies are needed for identifying dimensions of process quality that are the most beneficial for children's early academic development. Further studies may help to design and improve professional development programs in early childhood education by prioritizing certain aspects of teaching practices





**Thank you for your  
attention!**

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