Comparison of Measurement Systems for Collecting Teacher Language Data in Early Childhood Settings

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Background
- Teacher language input plays an important role in child language development (Dickinson & Porche, 2011; Giralametto & Weitzman, 2002).
- Enhancing teacher language input is of particular concern in classrooms serving children with or at risk for language impairments, considering the relationship between early language delays and future literacy skills (e.g., Bowles et al. 2009).
- An essential task in designing research aimed at training teachers to support child language growth is determining how to measure teacher language input within a complex classroom environment.
- The existing literature examining the efficiency and efficacy of various measurement systems in classroom research is largely limited to behaviors and participant populations that are outside the field of language development in early childhood special education (Lane & Ledford, 2014).
- Additional information is needed to determine the extent to which various measurement procedures, particularly those that are more feasible for use in complex classroom environments, are valid and reliable for estimating teacher language input.

Method

Data Collection
- Video and audio recorded samples of teacher-child interactions.
- Samples collected during periodic assessments of targeted classrooms.
- Samples ranged from 15-20 min (M = 19:39 min).
- 16 total samples analyzed (minimum of 1 sample per teacher, range of 1-4 samples per teacher).

Coding
- Teacher utterances coded using adapted operational definitions from the Code for Interactive Recording of Children’s Learning Environments (CIRCLE, Atwater et al., 2014).
- Video samples coded by 4 different coders, each utilizing a different measurement system:
  - TER: Every teacher utterance recorded and categorized.
  - MTS: Teacher utterance recorded and categorized only if she was actively speaking at the end of each interval (5 s).
  - PIR: Teacher utterance recorded and categorized only if she was actively speaking at the end of each interval (5 s).

Duration:
- Beginning and end of every teacher utterance marked.

Analysis
- Each MTS and PIR file compared to the corresponding TER and duration file.
- Comparisons across measurement systems:
  - Total utterances.
  - Quality of language (proportion of utterances coded as language stimulating).
  - Duration of child directed speech.

Results: Efficiency

- MTS was the most efficient of the three measurement systems.
- PIR required the greatest amount of time and did not produce accurate estimates of the frequency of child-directed utterances.
- TER required minimally more time compared to MTS, and provided higher accuracy.

Conclusions
- Discontinuous measurement systems did not provide consistently accurate estimates of the frequency of teacher language.
- Both estimates of quality of teacher language were more accurate than frequency, however systematic errors were still evident.
- Findings related to frequency and duration align with previous work regarding the accuracy and efficiency of MTS and PIR in classroom-based measurement contexts (Lane & Ledford, 2014).
- Researchers interested in examining frequency of teacher language input in classroom contexts should consider the loss of accuracy associated with the use of discontinuous measurement systems.
- TER did not take considerably more time to complete compared to MTS and PIR, however this study focused solely on one feature of teacher-child interactions; efficiency finding may not be replicated if the goal is to measure child, teacher, and classroom features simultaneously.

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