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An educator-administered measure of language development in young children[☆]

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ABSTRACT

An increasing number of infants and toddlers in many countries are enrolled in early childhood education (ECE) programs, and educators thus play a central role in stimulating language development in these young children. A valid, brief educator-completed measure of language development in young children has important uses both for the identification and monitoring of language development and for the guidance and evaluation of intentional instruction and targeted interventions for children who need it. We present such a measure here for Danish, the *CDI: Educator* (CDI-Edu) version, which is based on well-developed and validated parent report measures, adapted for the early childhood education setting. It requires approximately 10 min per child on the part of the educator. It includes a 70-item vocabulary checklist, as well as questions concerning the child's use of decontextualized language with respect to objects and actions distant from the here and now. The test has been standardized on a total of 5097 children aged 18–34 months. Test-retest and internal consistency measures demonstrate reliability. Validation is established through correlations with age, maternal education, the Danish One-Word Picture Vocabulary Test, and the Social Emotional Assessment Measure.

1. Introduction

Assessments are core tools for both basic and applied developmental science. For research, they provide normative information which assists in mapping both general patterns and variation in development. At an individual level in applied work, they assist in identifying children at risk for, or actually experiencing, significant developmental delay or other difficulties; they provide information for designing appropriate intervention; and they are essential for evaluating the impact of that intervention. At a group level, they illuminate strengths and weaknesses in populations, which can inform the design of appropriate educational programs, as well as serving to evaluate educational and other group-level interventions.

These considerations are especially relevant for early language development, in the light of research which has demonstrated the foundational role of language for literacy and other components of cognitive and educational development (Duff & Castles, 2015; Marinus & Castles, 2015). Both assessment and intervention in this domain are increasingly focused on the first three years of life.

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Early language assessment during this period presents some substantial challenges (Marchman & Dale, 2018). Structured tests are efficient with respect to time, but they require substantial training on the part of the assessor, and compliance on the part of the young child. Language sample analysis, which has played a central role in the study of child language, requires substantial time as well as training for assessors, and the willingness of young children to engage in conversation with a typically unfamiliar adult.

For these reasons, parental report has become an increasingly widely used assessment technique. Parents have experience with their child which is not only more extensive, but more representative of the child's ability. Research has confirmed that when tapped appropriately, for example, using recognition ('does your child say *leg*') rather than recall ('tell me the body part words you have heard your child say'), parent report provides highly valid information (Fenson et al., 2007). At present there are two major parent report measures of early language for English; both have been adapted for numerous other languages although not all projects have advanced to actual collection of norming data. Rescorla's Language Development Survey (LDS; Rescorla, 1989) was originally designed as a brief expressive language-screening instrument for children between 12 and 24 months, though it has more recently been normed for a wider age range. The LDS demonstrates excellent reliability including internal consistency, as well as validity as a screening device (Rescorla, Ratner, Jusczyk, & Jusczyk, 2005).

The most fully developed set of parent report measures for language are the MacArthur-Bates (originally MacArthur) Communicative Development Inventories (CDIs, Fenson et al., 2007; <http://mb-cdi.stanford.edu>). The CDIs are designed to measure vocabulary across the full range of ability levels, as well as additional dimensions of communicative development. The CDI:Words & Gestures (CDI:WG) was designed for typically developing children between 8 and 18 months. On the 396-item vocabulary checklist, the parent is asked to indicate if the child "understands" or "understands and says" the word. The CDI:Words & Sentences (CDI:WS) was designed for typically developing children between 16 and 30 months. For each word on the 680-item checklist, the parent is asked to indicate if the child says (and understands) the word. Both measures have been used for somewhat older children with a variety of developmental delays (Fenson et al., 2007). Adaptations of the CDIs have been made for a particularly wide range of languages (<http://mb-cdi.stanford.edu/adaptations.html>), providing a foundation for the new format proposed here.

In addition to these 'long-forms', there are short-form instruments at each of these two development levels (Fenson et al., 2000). Each includes ~100 vocabulary items which have been shown to predict long form vocabulary scores with impressive accuracy. The choice between long and short forms must be made carefully, in light of the goals of the research or clinical work.

Parent report instruments also have the potential for obtaining large samples, which is valuable for research and for the determination of more valid norms, as well as broad applications in educational and clinical practice. However, even parent report does have limitations. Some parents, especially those with very low education, may find it difficult or provide less valid information (Dale et al., 1996; Roberts, Burchinal, & Durham, 1999). In other cases, assessment may be sought in a language which is not the main one spoken at home, that is, the second language for immigrant children, which the parents may not be able to assess.

Moreover, according to OECD (2016) a substantial proportion of infants and toddlers in many countries are enrolled in early educational programs. Educators are thus actively engaged in stimulating language growth in young children to much higher extent than previously, and face the challenge of ensuring development. However, they lack a valid, easy-to-administer, and cost-effective measure to monitor children's growth in this domain.

In the present study, we present and evaluate a measure of early language development similar to parent report, but completed by educators of young children. Under many conditions, educators have sustained experience with young children. They may also have received information about language development as part of their training, and there is often an explicit attention to children's language in the classroom. Their experience with multiple children may increase their sensitivity to typical and atypical development, though the divided attention inherent in a classroom reduces the amount of attention to individual children. And perhaps most important, they have interacted with children in a far more limited range of contexts than is the case for parents. Thus the validity of educator-based assessment is an empirical question, and some adaptation for this context is likely to be necessary. The successful use of this approach for the socio-emotional domain (e.g., Sjoie et al., 2017) is encouraging. If successful in the language domain, this assessment approach would be cost-effective and highly valuable both for the identification and monitoring of language difficulties, and for large-scale research studies.

We present a new educator-administered measure here, the CDI: Educator (CDI-Edu), which is based on well-developed and validated parent report measures, adapted for the preschool setting. It has been developed for Danish, but the procedure is appropriate for other languages, especially those for which the corresponding parent report measure is available. We describe the development and norming of the new CDI-Edu, as well as evaluating its reliability and validity.

2. Method

2.1. Development and structure of the CDI-Educator

The primary foundation of the CDI-Edu is the CDI: *Ord og Sætninger* ('CDI: Words and Sentences'; referred to below as the Danish CDI:WS), a Danish adaptation (Bleses et al., 2008) of the *MacArthur-Bates Communicative Development Inventory: Words & Sentences* (Fenson et al., 2007). The Danish CDI is designed for children 0;8 to 3;0; it includes a 725-item vocabulary checklist, questions about language use beyond the here and now (displaced reference), and several sections assessing grammar. It was normed on a population-representative sample of 3714 children.

Following a standardization of the Danish CDI:WS, a shortform instrument was developed for screening children at or near the age of 36 months (Vach, Bleses, & Jørgensen, 2010). This instrument included only a 100 item vocabulary checklist. The choice of words from the full 725 words was based on several criteria, which were applied to the norming dataset. Because it was intended to screen

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