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Title Registration for a Systematic Review: The Effect of Language Comprehension Training on Standardized Tests: A Systematic Review

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TITLE OF THE REVIEW

The Effect of Language Comprehension Training on Standardized Tests: A Systematic Review

BACKGROUND

It is well known that oral language skills, especially vocabulary, are strongly related to the development of reading comprehension and, in turn, to educational outcomes later in schooling (Biemiller, 2003; Storch & Whitehurst, 2002). However, there are large differences in language comprehension skills among children (Melby-Lervåg et al., 2012). Children in lower socioeconomic groups and children with delayed language development are often considered to be at risk for later reading failure because of their limited vocabulary knowledge from an early age, as well as their slow rate of developing vocabulary. For instance, Hart and Risley (2003) found a large gap in vocabulary size between children from different socioeconomic groups as early as three years of age, and researchers also point to large differences in vocabulary knowledge between young second-language learners and first-language learners (Lervåg & Aukrust, 2010; Melby-Lervåg & Lervåg, in press). Moreover, a noteworthy finding from studies is that these differences between children in learning words seem to be maintained through primary school (Biemiller & Boote, 2006; Lervåg & Aukrust, 2010; Melby-Lervåg et al., 2012;). Due to these facts, intervention studies have aimed to boost children's development in vocabulary and language comprehension skills. Several research designs have been used in this regard, with a variety of training approaches and settings in how and where the interventions have been implemented.

In studies of language comprehension training, effects are often measured by both custom tests and standardized tests. Custom tests give us information about whether children have learned something that has been explicitly covered in an intervention (e.g., direct trained words embedded in a training program). However, the ultimate goal of these language-based interventions is to help children accelerate further growth in vocabulary and develop reading comprehension. Hence, to narrow the gap between children in vocabulary size and reading comprehension skills, we need information about whether the training has effects not only on custom measures but also on general growth in language and reading comprehension. More research into the question of whether oral language skills can be promoted in educational settings and produce effects that generalize to standardized tests of language and reading comprehension is therefore of utmost importance when we make policy decisions about whether such programs are suitable to be implemented in early childhood education and later schooling. Added understanding about the efficacy of intervention programs is needed towards the development of evidence-based interventions that can be implemented effectively in educational settings, with the goal of preventing later literacy failure for children at risk for problems with language and reading comprehension. Further, a more refined understanding of the underlying mechanisms through which interventions

are effective is also vital to provide a sound theoretical foundation for constructing better and more targeted intervention programs.

OBJECTIVES

The aim for this systematic review is to summarize the effectiveness of language comprehension training on standardized language comprehension and reading comprehension measures.

This review aims to answer:

(1) Can language comprehension training be generalized to standardized tests of language and reading comprehension?

(2) What features of language comprehension training are associated with generalized effects on language and/or reading comprehension?

(3) Are effects on standardized tests mediated through effects on the specific words that are trained?

EXISTING REVIEWS

Our review will differ from the prior reviews on several important aspects:

First, earlier meta-analyses have included studies that use both custom tests for the targeted training and standardized tests in their examination of training effects. Commonly, a mean effect size has been calculated where these two test types are merged together. This can yield a biased result regarding the effects of language comprehension training. The planned review will, in contrast, exclusively examine studies that report standardized measures in addition to measures of the words that are trained. In the overall mean effect size, the effects on standardised tests and custom measures will be calculated separately. Also, importantly, we plan to examine whether effects on standardised measures are mediated through effects on custom measures. This approach will give a unique contribution to the study of effectiveness of oral language intervention in educational settings.

In addition, several meta-analyses on the topic have examined the value of shared book reading solely (e.g Blok, 1999; Bus, van Ijzendoorn, & Pellegrini, 1995; Mol, Bus, de Jong, & Smeets, 2008), while others have included several types of vocabulary interventions in addition to print-based training (Elleman, Lindo, Morphy, & Compton, 2009; Marulis & Neuman 2010). Like Marulis and Neuman (2010) and Elleman et al. (2009), we want to include training studies focusing on both shared book reading and other types of vocabulary instruction. In addition, we also want to include studies that contain a broader view to oral language training (e.g., training focusing on listening comprehension, narrative skills, and morphology).

Also, prior meta-analyses have used very liberal inclusion criteria when it comes to training duration, and have included studies with as little as an hour of training (e.g., see Elleman et al., 2009). In contrast to the earlier meta-analyses by Marulis and Neuman (2010) and Elleman et al. (2009), we will have a more restricted inclusion criterion when it comes to the duration of time spent in training. Our main interest is to get more knowledge about training studies' impact on the general growth in children's language development and reading comprehension skills. This perspective makes it relevant to focus exclusively on studies that report standardized measures and a minimum duration of time spent in training. Nevertheless, it is to be expected that intervention studies using standardized measures will have a longer time frame of training than studies using only custom measures.

Next, regarding settings, the above-mentioned meta-analyses vary in their inclusion criteria. Bus et al. (1995) and Mol et al. (2008) studied book reading in parent-child settings, excluding interventions implemented in educational settings. Blok (1999) and Elleman et al. (2009) on the other hand, included only training studies in educational settings, while Marulis and Neuman (2010) included training studies implemented in both home- and educational settings. Our aim is to focus on language training done in educational settings solely, because these studies have the most relevance for educational policy and practice. Thus, we want to exclude interventions implemented by parents or in the child's home environment.

Furthermore, our aim is to examine the effects of language comprehension training on both standardized measures of language comprehension and reading comprehension skills. The review will include studies conducted in preschool and later educational settings up to the end of secondary school. This expands the current literature in incorporating training studies from both an early age in preschool and school age children. The National Early Literacy Panel (2008) studied shared-reading interventions in children ages zero to five, and no studies in their sample examined the impact of intervention on reading as an outcome variable. Similarly, Marulis and Neuman (2010) targeted only the very early years of vocabulary development (birth through age 6) and did not include measures of reading comprehension. On the other hand, Elleman et al. (2009) examined the impact of vocabulary instruction on reading comprehension in school age children where the majority of the studies included instruction conducted in Grades 3 to 5. As earlier mentioned, transfer effects to standardized measures are typically much smaller than effect sizes for custom measures. Elleman et al. (2009) found minimal effects on standardized reading comprehension measures (SMD = 0.10), while Stahl and Fairbanks (1986) reported small to moderate (STM = 0.30) for global measures of comprehension. Elleman et al. (2009) argue that standardized measures often are insensitive to vocabulary growth. However, it has also been suggested from other researchers (Fricke, Bowyer-Crane, Haley, Hulme, & Snowling, 2012) that the success of vocabulary training might depend upon the age at which it is given or the amount of training received. This notion supports the need for a more systematic review studying generalized effects on reading comprehension from language comprehension training in both early childhood education and later schooling.

Finally, the planned review will also expand the current literature by including recent research from past years. Elleman et al. (2009) included studies from 1950 to 2006, and Marulis and Neuman (2010) conducted their search through September 2008.

In summary, our planned review will be taking a more systematic approach with different inclusion criteria than earlier reviews on the topic. The main interest and need for this review is linked to the question whether language comprehension training effects can be transferred to general measures. In order to gain more knowledge of this, the review will take a strict approach to the type of training, amount of instruction conducted in the studies, types of research designs, and outcome measures included.

INTERVENTION

The review will include randomized controlled trials and quasi-experimental studies in which individuals or groups of children receiving language comprehension training are compared with a control group. In quasi-experimental studies with a control group, pre-test data must be reported. Studies will be included in the review if they have one of the following types of control conditions: no treatment, waiting list treatment, treatment as usual or alternative treatment.

Studies will be included if they meet the following criteria:

- Studies that include training in language comprehension skills, including vocabulary interventions (both direct vocabulary training and/or book reading interventions) and training studies with a broader focus on oral language training.

- Studies that include training given in educational settings (interventions implemented by parents or in children's home environment will not be eligible).

- Duration of the intervention has to be a minimum of 10 lessons (approximately 45 min x 10) or more.

POPULATION

The review will include studies conducted in preschool and educational settings up to the end of secondary school, corresponding approximately to ages 4-16. Groups of unselected children, children with language problems, or at risk for language and reading problems will be included in the study. In the analysis, such sample characteristics will be used as moderator variables. Studies focusing on children with physical, mental, or sensory handicaps will not be included in the review.

OUTCOMES

Custom tests

Custom measures of the specific words that are trained will be used.

Standardized tests of language comprehension and reading comprehension

Outcomes of interest in language comprehension and reading comprehension measured by standardized tests will be included. Outcome variables related to language comprehension can include standardized measures of vocabulary (either expressive or receptive) and standardized tests of grammar, narrative skills, and listening comprehension. As for reading comprehension measures, the most common assessment comprises asking the child for detailed questions about the content of a text. Nevertheless, reading comprehension tests used in different studies will probably vary in response format, and also along other essential dimensions, such as passage length, type of text, or time limit. This indicates that inclusion criteria and coding preferences should be developed due to questions concerning different formats in the reading comprehension tests.

Moderator coding

Differential effects from the different studies may be influenced by systematic differences related to design, participant, settings, duration of training, and type of exposure. Moderator variables will therefore attempt to account for these kinds of differences among the research studies. In addition, we will code variables related to study quality as moderator variables.

STUDY DESIGNS

The review aims to include quantitative evidence from randomized controlled trials and quasi-experimental studies with control groups only. Within subject, single subject, or pre-posttest designs with no control design will not be eligible.

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ROLES AND RESPONSIBILITIES

There is both content and methodological expertise within the review team. The authors are all working on related topics within the field of language, reading development, and intervention. Professor Monica Melby-Lervåg and Professor Arne Lervåg have conducted several meta-analyses and have expertise in statistical analysis. Furthermore, the review team have experience with electronic database retrieval, and have access to library support staff when needed.

FUNDING

Financial support is received from the research council of Norway (Educational research 2020).

POTENTIAL CONFLICTS OF INTEREST

None declared.

PRELIMINARY TIMEFRAME

- Date you plan to submit a draft protocol: 1 December 2013
- Date you plan to submit a draft review: 15 March 2014

DECLARATION

Authors' responsibilities

By completing this form, you accept responsibility for preparing, maintaining, and updating the review in accordance with Campbell Collaboration policy. The Coordinating Group will provide as much support as possible to assist with the preparation of the review.

A draft protocol must be submitted to the Coordinating Group within one year of title acceptance. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Coordinating Group has the right to de-register the title or transfer the title to alternative authors. The Coordinating Group also has the right to de-register or transfer the title if it does not meet the standards of the Coordinating Group and/or the Campbell Collaboration.

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Form completed by: Kristin Rogde **Date:** 17 September 2013