SREE Abstract

“Language Interventions for Improving the L1 and L2 Development of Dual Language Learners in Early Education and Care: A Meta-analysis”

BACKGROUND
A large and growing number of students in the US or Europe come from homes where the societal language spoken in educational contexts is not the primary language spoken at home (Passel, 2011). Growing up with two languages in different constellations may cause variation in language development, but is not necessarily associated with developmental problems (Bialystok, 2001; De Houwer 2009; Tracy, 2007). However, many dual language learners (DLLs) enter school with language skills and experiences that differ significantly from monolingual children (Ballantyne, Sanderman, & McLaughlin, 2008; Stanat et al., 2002; Tienda & Haskins, 2011). They often lag behind their monolingual peers due to varying input and socioeconomic situations (Dubowy et al., 2008; Reardon & Galindo, 2006). Language skills in the societal language in the preschool years are substantial to educational success (August & Shanahan, 2006; Weinert, 2008). Thus, early childhood is seen as a critical period for DLLs (Buysse, Peisner-Feinberg, Paez, Scheffner Hammer, & Knowles, 2014).

RESEARCH OBJECTIVES AND RESEARCH QUESTIONS
The aim of the meta-analysis is to synthesize international findings on the effectiveness of language promotion interventions in early childhood education and care [ECEC] settings on L1 (home language) and/or L2 (society language) development of DLLs. In our meta-analysis, all studies with DLLs are included, but we code for (1) bilingual children who are at risk of lagging behind monolingual children and (2) bilingual children who are typical learners. The quality of experimental studies will be rated through a bias index. Intervention effects will be aggregated in relation to L1 and L2 expressive and receptive abilities. Variations in effect sizes will be analyzed through subgroup, moderator analysis, and meta-regressions. Research questions of the given meta-analysis are:

1. To which extent do language interventions accomplished in ECEC effect the L2 development (society language) of DLLs?
2. To which extent do bilingual language interventions accomplished in ECEC effect the L1 development (family language) of DLLs?
3. Which language intervention approach is more effective in promoting L2 development of DLLs?
4. Are language intervention effects related to specific intervention characteristics (e.g., implementer or fidelity)?
5. Do intervention effects on L2 development vary by country or language group?

Language interventions are categorized in (1) additive pull-out programs, (2) integrated, interaction-based strategies in classrooms, (3) shared book reading, (4) digital teaching, (5) two-way immersion approaches/bilingual approaches, and (6) combination of language support strategies.

METHODOLOGY
All studies published in English or German will be included, but country of origin will be examined as covariate. Selection, search and evaluation of relevant studies were followed:
Selection Criteria
(1) Language Intervention studies with a control group with at least 10 DLLs, enrolled in ECEC
(2) Treatment(s) must be implemented in center-based care settings (e.g. infant-toddler classrooms, preschools, or kindergartens). We excluded studies accomplished in clinical or family settings.
(3) Treatment(s) can be implemented by the educator/teacher or external trainer. Therapeutic interventions in ECEC were excluded.
(4) Studies must provide quantitative data on language development of young children from birth to six years.
(5) Studies must be published or presented after 1960 in English or German.

Evaluation of Studies and Coding Strategy
A multi-step full-text coding procedure was used. All studies were double coded by two independent coders. Disagreements between the coders were resolved through discussion and consensus. First, the relevance of studies was estimated by screening title and abstract. Second, full texts were coded with a screening form to code intervention characteristics and to evaluate the quality of studies and sufficient statistical data.

Systematic Literature Search
Electronic Search was conducted in ERIC, PsycINFO, PsynDEX, ProQuest D&T, FIS, WISO. Search terms included proband, intervention, context, and outcome). For details of the search process see Egert, Sachse and Groth (2016; in press). Further, a hand search in topic related meta-analyses and reviews plus reference lists of relevant papers were accomplished. Additionally, a web-engine search with the same keywords was conducted.

Meta-Analysis and Moderator Analysis
Statistical information was transformed into the effect size Hedges’ g using Comprehensive Meta-analysis (CMA) Software V3 (Bornstein, Hedges, Higgins, & Rothstein, 2014). All treatment effects were integrated into a summary effect size with a random effects model, nesting the effect sizes under treatments. With CMA, a weighted summary effect g’ was calculated and weights were given based on the variance of effect sizes within a treatment.

RESULTS
Double-coding procedure will be finished 2017 and final results will be presented at the SREE conference.
So far, 45 out of 114 studies were reliably double coded (figure 1). Out of these 45 studies 17 were eligible for meta-analysis. The 17 studies included 21 treatments evaluated through 23 independent samples. Sample size varied between 21 and 580 participants. Most of the studies were conducted in the US and Germany, but came also from Canada, Greece and Switzerland. All studies estimated intervention effects on L2 development, 5 provided additional data on L1 development (table 1). Preliminary results show a small aggregated effect (k=23) on L2 receptive skills and a marginal effect on L2 expressive skills. For the L1 expressive and receptive abilities the aggregated effect was medium size with trend to high. Intervention effects on L2 development differed significantly between countries and intervention characteristics (implementer, fidelity and type of intervention). Bilingual programs, combined
approaches (e.g. with small group activities, dialogic reading, embedded strategies) and dialogic reading intervention had almost equal small-to-medium effects. Bilingual programs had mainly positive effects on L1 development, but mostly null or negative effects on L2 development.

**DISCUSSION AND CONCLUSION**

The meta-analysis is still work in progress. So far, intervention studies evaluating the improvement of L1 development are widely missing. For L2 development, intervention effects vary from medium negative to large positive effects. Moderator analyses show that quality of intervention matters. Language interventions where fidelity was rated as high or guaranteed through training or supervision for teachers had positive effects, whereas interventions that were not implemented as intended had negative effects on L2 outcomes. Further moderator effects are under analysis.

A complex and interacting relationship between the language system of the L1 and L2 of children are suggested in literature (e.g. Brisk & Harrington, 2007; Cummins, 1979; Leseman, Scheel, Mayo & Messer, 2009). However, our findings in line with Moser, Bayer and Tunger (2010) do not support this assumption. More research is urgently needed to encode L1 and L2 transfer effects.

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**REFERENCES**

* Studies included in the meta-analysis with quality measures are marked with an asterisk.


Crevecoeur, Y.C., Coyne, M.D., & McCoach, D.B. (2014). English Language Learners and English-Only Learners’ Response to Direct Vocabulary Instruction. *Reading and Writing Quarterly, 30*(1), 51-78. doi:


APPENDIX

Figure 1. Flow diagram on the systematic literature search
Table 1. Overview of relevant studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Publication type</th>
<th>Country</th>
<th>IG N</th>
<th>CG N</th>
<th>Comparison</th>
<th>Approach</th>
<th>Fidelity</th>
<th>Outcomes</th>
<th>Implementer</th>
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<td>118</td>
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<td>teacher &amp; extern</td>
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<td>high</td>
<td>L1 &amp; L2</td>
<td>extern</td>
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<td>guaranteed</td>
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Note. IG=intervention group; CG=control group; TC=treatment-control comparison; AC=alternative treatment;