Title: Language Intervention For Children With Down Syndrome: The Impact Of Implementation Quality On Intervention Effects, Preliminary Findings

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Introduction: Language impairment is common in children with Down syndrome (Miller, 1999). A review of previous language interventions has shown that children with Down syndrome can benefit from language interventions, but the results across studies varies from small to large effect sizes (Smith, Hokstad, & Næss, submitted). Yet, few studies have investigated the relationship between intervention effects and implementation quality in children with language impairment, as variables related to implementation quality are often lacking in language interventions (Lieberman-Betz, 2015; Hampton, Kaiser, & Fuller, 2015; Kaiser & Roberts, 2013). Within implementation research in general variables such as how well the intervention program fit in to the host setting and it’s participants, attendance, implementer’s loyalty to the intervention program and participant responsiveness have been suggested to be strong predictors of intervention outcomes (Carroll et al., 2007; Durlak & Dupree, 2008; Kadevarek & Justice, 2010; Meyers, Durlak, & Wandersman, 2012; Meyers et al., 2012). In their ongoing systematic review of implementation quality in language interventions for children with Down syndrome, Hokstad, Smith, and Naess (in progress) found that only one of the included studies conducted an outcome analysis of the influence of Implementation on intervention outcomes. The selection of implementation variables investigated were constricted to attendance and implementers loyalty to the intervention program, with results showing a significant relationship between attendance and intervention outcomes (Burgoyne et al., 2012). This sub-study is part of a larger national vocabulary intervention study for first graders with Down syndrome. The aim of this sub study is to investigate whether implementation variables can explain variance in outcomes within children participating in this study.

Method: 104 first graders participated in this study (randomized control trial with waiting list control design). 50 children were assigned to the intervention group which started training at the beginning of the school year. 54 children were assigned to the waiting listed control group which started training after the intervention group had completed 15 weeks of training. The intervention consists of an intensive digital (iPad) vocabulary intervention with daily training sessions. New words are introduced every week via picture book reading and corresponding structured training tasks. The program includes both individual sessions, as well as small group and classroom activities every week for 30 weeks. The intervention was implemented by the children’s teachers, who were trained in intervention delivery prior to implementation. Measures include direct measures on vocabulary (trained receptive breadth, trained expressive breadth, trained receptive depth, trained expressive depth and trained expressive grammar), as well as indirect measures on expressive vocabulary breadth (Picture Naming, (WPPSI 3; Wechsler, 2002)) and receptive vocabulary breadth (British Picture Vocabulary Scales (BPVS; Dunn, Dunn & Whetton, 1982)). Language measures were collected from the participants at three time points, pre-, mid and post intervention (15 weeks apart) to examine intervention effects. Process data from intervention delivery were collected via teacher self-report forms (distributed digitally every 2nd week) and digital tracking of intervention sessions (all individual sessions). The digital tracking data consists of both quantitative data (amount of sessions completed and time spent training) and qualitative data of learning dialogues (audio recordings of teacher – child dyads).

Result: Participants were native speakers and included both children with speech as their primary means of communication and children with limited verbal language and represent a natural age-cohort of children with Down syndrome. Data collection is completed and the data is currently under preparation for data analysis. Summary scores of direct language measures and indirect language measures, the percentage of intervention sessions completed (attendance) and a measure of child engagement during intervention sessions (participant responsiveness as reported by teachers) are being computed. Data will be analysed using regression modelling to investigate intercorrelation between language outcome on trained vocabulary and a selection of quantitative prediction measures (attendance, prior language abilities and child engagement) which will be ready for analysis within the timeframe of the current poster presentation.

Discussion: Measuring, evaluating and reporting implementation is necessary in order to achieve reliable and valid results from intervention research (e.g. Meyers, Durlak & Wandersman, 2012). According to Durlak & Dupree (2008) one of the most important questions within implementation research in the future is related to the investigation of aspects of implementation specific to different types of innovations and different groups of participants. There is a need for implementation research specifically related to language interventions for children with Down syndrome (Hokstad, Smith & Naess, in progress). By investigating implementation data collected in a large scaled language intervention study the authors seek to inform future
intervention studies for this group with regards to collection, evaluation and reporting of implementation data. Furthermore, this knowledge is essential in the promotion of research-based practices, as it can provide an understanding of under which conditions language interventions are effective (e.g. Wright & Kaiser, 2017).

References/Citations: