The Effects of Shared Reading on the Geometry Vocabulary Knowledge of Preschool Children At Risk for Language Delays

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Introduction

The conclusive purpose of this research project, under the supervision of Ph.D. candidate Taryn Wade, is to argue that the effects of shared reading can support the development of early mathematical vocabulary language skills — specifically preschool aged children determined to be at risk for language delays. The conditional settings are comprised of mathematics instruction based on learning objectives and appropriate procedures in line with stagnated development.

Preschool domains include number and operations; geometry; and measurement (NCTM, 2006). Preschool geometry includes shape concepts and spatial relations and within this study, shape concept vocabulary knowledge will be examined. Shared interactive storybook readings and the utilization of diagnostic reading patterns with geometric mathematicalexpressions in the literary sense inspire newfound strategies which aid in analytical questioning. These strategies will create exposure to new terms and opportunities for expanded comprehension.

In an analytical tone, an interactive **shared reading** is a literacy routine that utilizes prompting questions to stimulate the child's awareness of specific math terminology; **dialogic reading** furthers this concept by establishing a systematic framework for adult engagement with the child during the shared reading context. Ultimately, the results of the study aim to expose the thereafter improvement of math-related language and content knowledge (i.e. shape characteristics and correlated connections of storybook to personal experiences) in pre-school-aged children exhibiting early signs of language delays.

Methods

Minimum of three participants at risk for language delays, all recruited from private community-based childhood centers based on teacher recommendations.

This single-case research design is a multiple probe across word sets. Visual analysis of the data will be used to make decisions regarding phase decisions (e.g., moving from baseline to intervention tier one). A minimum of six phases with five data points per phase will be implemented and analyzed in order to determine the improvement rates of each participant.

BASELINE

Target words (participant demonstrated limited or no expressive knowledge) will be selected prior to the start of the study. The probe, called a knowledge check, will be given in all phases to measure the expressive knowledge of target math vocabulary words.

INTERVENTION

Open-ended questions and Wh-questions — what, where, when, why — will be asked in order to focus the child's attention on what is happening on a page and the illustrations in the storybook.

In order to determine if the intervention is being implemented as designed, a **Procedural Fidelity (PF)** check will be measured for 20% of sessions across baseline, intervention, and maintenance for all participants. **Inter-Observer Agreement (IOA)** will assess participant responses on the knowledge check using a researcher-created rubric.

MAINTENANCE

Collected one- and two-weeks post-intervention to measure participant retention of the target vocabulary knowledge

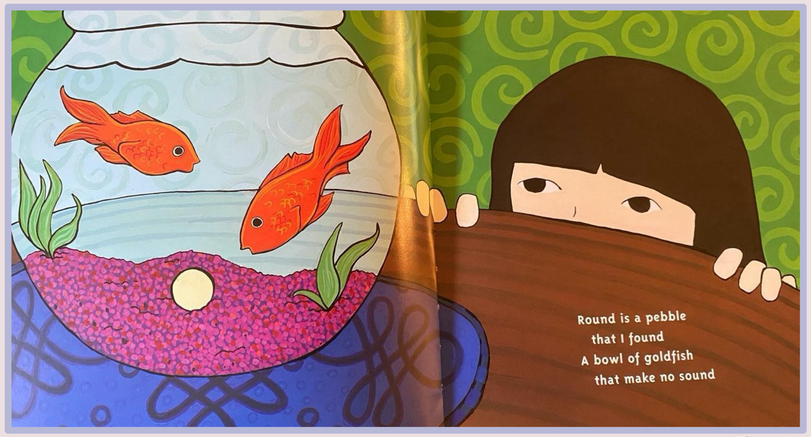
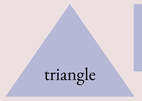


Figure 1

WORD SET 1

WORD SET 2



WORD SET 3

Results

The results of shared reading interventions in correlation with an increase in mathematical vocabulary is still underway. Thus far, results of the baseline phase coded comparatively to the intervention phase suggests an improvement in the child's proficiency to comprehend geometry vocabulary words. In regard to projected data (see figure 2), the analysis will include a trend line monitoring changes from baseline to intervention phases. This visual data set will then be used to dictate the existence of a functional relationship between the independent variable and the dependent variable.

The comprehensive results are predicted to show steady upwards growth as participants are taught shape attributes and examples of shapes from the storybooks and participant personal experience using a shared reading routine modeled after a dialogic reading framework.

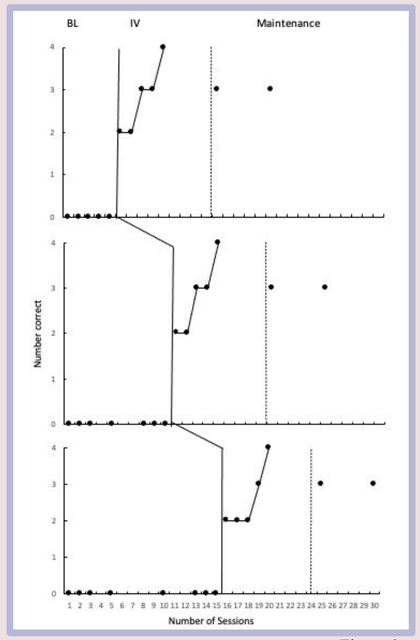


Figure 2

Acknowledgements

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Discussion

After the baseline and intervention phases were conducted, the extrapolation of results conveys an increased level of geometric vocabulary knowledge. Maintenance data is projected to show a retention of knowledge learned during intervention.

- In order to avoid inconsistency in intervention delivery and reliability of scoring participant responses, Procedural Fidelity (PF) and Inter-Observer Agreement (IOA) measures were incorporated into the data analysis and the results section of the study.
- Within this study, there was an increased focus on math-focused shared reading, as more single case design studies with children at risk for or with identified disabilities need to be incorporated into dialogic or shared reading intervention studies.
- Furthermore, limitations within our study included difficulties in distinguishing particular differences in answers when actively scoring on an IOA rubric, as the distinction between hand gestures and verbal answers were incorporated into the delineation of adequacy or inadequacy regarding "Knowledge Check" answers.
- A second limitation is that storybooks were not read in baseline. Potential avenues for future research within shared and dialogic reading intervention strategies may pertain to a more specific demographic of children possessing learning disabilities rather than those "at-risk" for learning delays, as well as an expansion of these intervention strategies within the home in addition to the school environment.

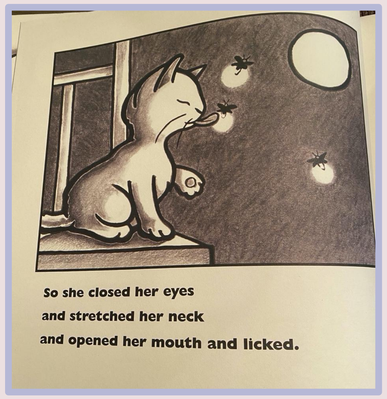

Figure 3

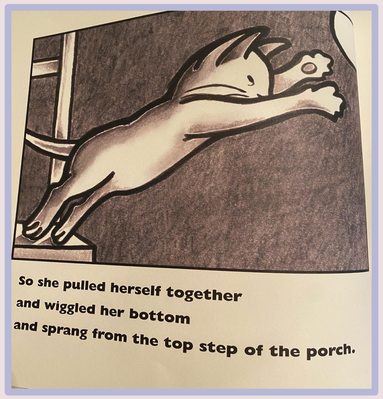

Figure 4

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