Learning Task #2

Quantitative Research Article Review

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Research article review

Hammerschmidt-Snidarich, S. M., Maki, K. E., & Adams, S. R. (2019). Evaluating the effects of repeated reading and continuous reading using a standardized dosage of words read. *Psychology in the Schools*, *56*(5), 635-651. https://doi.org/10.1002/pits.22241. Reviewed by Besart Hysniu.

Introduction

The article by Stephanie M. Hammerschmidt-Snidarich and colleagues Kathrin E. Maki and Sarah H. Adams first appeared in the journal "Psychology in the Schools" on February 19th, 2019. Hammerschmidt-Snidarich and colleagues evaluated the effects of repeated reading and continuous reading interventions using a standard dosage of words read, aimed at grade 2 and grade 3 students reading below the 50th percentile.

RR is a widely used intervention in addressing reading fluency difficulties (Samuels, 1979), where a student is exposed to the same passage of text more than once. The RR practice sessions last 1-2 minutes per reading, with the premise that improved reading speed and accuracy will result in improved comprehension of the same material (Samuels, 2008). In contrast to RR, continuous reading (CR) refers to the wide reading of text passages for a specific time. Unlike RR, CR does not resemble the 'practice' of a text and is more representative of a typical reading experience (O'Connor, White, & Swanson, 2007).

The study was in part a response to studies that found no difference between RR and CR (Rashotte & Torgesen, 1985; Wexler et al. 2008). A distinguishing feature of the current study is the redefining of the dosage of treatment. Authors argue that their novel approach of measuring dosage as the overall number of words read rather than timed length of instruction is both a more

equitable measure of the overall volume of instruction and a more representative measure of the effects of instruction.

The current study comprises of a group of 40 students from second and third grade that are assigned to one of the two conditions, representing the RR and CR treatments. Students in both groups completed a pretest and posttest measuring their reading fluency and comprehension. In addition, researchers asked students to rate each intervention, which is an improvement over previous studies that compared the two interventions. Having students rate each intervention, authors believe, is important since it can impact the degree to which students will engage with the task, as pointed out in a study by Cox & Guthrie (2001) looking at the role of motivation on reading enjoyment (e.g., curiosity, involvement, challenge; Cox & Guthrie, 2001). In this study, the researchers set out to answer four questions:

1. Is there a difference in the type of intervention (RR or CR) as measured by ORF?

2. Is there a difference in between the two interventions in terms of ORF, comprehension or the reading comprehension of the chosen passages?

3. Is there a difference between the two interventions (RR and CR) relative to the student's initial reading level as measured by the pretest?

4. How do the students rate the acceptability of each intervention?

Methodology

Participants

Participants in this study were obtained through consent forms sent out to parents of 373 children spanning kindergarten to fifth grade from a public elementary community school in a mid-size midwestern city and 40 students were recruited for this study. In this public school 87% of students qualified for a free or reduced lunch, which can indicate low socio-economic status

and possibly a higher prevalence of struggling readers. All of the participants in this study scored below the 50th percentile concerning their grade level benchmark on the CBM-R probe, a curriculum-based reading or ORF measure. The 40 participating students were randomly assigned to an RR and CR condition, with 22 in second grade and 18 in third grade. They all scored below the 50th percentile concerning their grade level benchmark on the CBM-R probe, a curriculum-based reading or ORF measure. There was no control condition in this experiment. Students engaged in the intervention for a total of 15 sessions over five weeks.

Measures

Instruments

CBM-R. Participants were administered three CBM-R (Shinn, 1989) probes during pretest and post-test measuring Oral Reading Fluency (ORF). Depending on the students' grade level, grade-appropriate reading materials were sourced from FastBridge Learning (Christ, Ardoin, & Eckert, 2011) and were 230-250 words in length.

aReading. A 15 to 30-minute computerized Comprehension measure was also administered before and after the intervention (aReading; Christ, 2015) to groups of five students at a time using a set of computer laptops with headphones. This measure also allowed for cross-grade comparisons through its 30-item score.

Acceptability Measure. Students completed an acceptability measure comprising of five researcher-created comprehension questions in a multiple-choice form that checked for factual understanding, inference questions probing for background knowledge, and a vocabulary question.

Analysis

The independent variable in this condition was the intervention group. The three measures of Oral Reading Fluency, comprehension and the intervention acceptability were compared using a two-way analysis of covariance (ANCOVA). The CBM-R median posttest score was the dependent variable and the median CBM-R pretest score served as the covariate. To compare the effects of the intervention group on comprehension, the independent variable was the intervention group whereas the dependent variable was the median passage comprehension score. Reading achievement differences as a function of reading skill were explored by a three-dimensional plot which was then examined for patterns. Student acceptability was scored as either positive or negative, based on the level of the four-item scale, with responses 0 and 1 scored as negative and scores 3 and 4 as positive. Logistic regression was then applied to the acceptability rating scale results and the results were compared between the two groups. Students were screened to an appropriate reading level based on the pretest, resulting in three grade levels that matched instructional level.

Results

Mean pretest and posttest oral reading fluency and comprehension scores were standardized and revealed no significant difference between groups. All students read with a reading accuracy of at least 90% which helped rule out decoding ability as a possible contributor to the low reading fluency. The mean of words read correctly per minute was 88wpm across the sample of students, with a standard deviation of 23. In addressing their four questions, results indicated that (1) both reading interventions positively impacted ORF in all but two students (one in each group). In terms of other measures, the only significant difference found was in the median intervention passage comprehension score, with the RR group outperforming the CR group $F(1, 38) = 9.99$, $p < 0.05$ with a large between-group effect size ($d = 0.99$). A visual

scatterplot revealed that initial reading impacted growth during the intervention, such that faster readers benefited more from either intervention, despite adjusting for the dosage of instruction. On the acceptability measure, the analysis revealed an 8:1 preference for the CR intervention.

Research Implications

Research by Hammerschmidt-Snidarich and colleagues is a thoroughly conducted study, despite the small sample size which makes the findings difficult to interpret, as per the Central Limit Theorem, and the authors acknowledged this limitation. Nevertheless, authors introduce a novel approach to the measurement of dosage of intervention, arguably with important implications for future research. Authors make this argument by highlighting earlier research findings by main author that the difference between slower and faster readers can be as high as twice the amount of words read by those who read faster (Hammerschmidt-Snidarich, Maki, & McComas, 2018). The argument for shifting to a measure of dosage at least provides the slower readers with enough time to read the same or a similar number of words as their higher-performing peers. Researchers argue that the efficacy in measuring the performance of slower-readers is improperly evaluated when the dosage of instruction is time-based. By measuring the word amount rather than time of intervention the slower readers get similar exposure to the volume of words as their faster reading counterparts. This change alone, authors argue, provides a level-playing field for comparing interventions between readers with varying reading speed. However, this also means that varying the duration of instruction per session may present a problem regarding what is being measured.

Authors remind us that the way we currently measure dosage, through length of exposure, affects not only how we measure progress with struggling readers, but also puts them at a disadvantage during intervention if they read slower than their peers; Matthew effects

(Stanovich, 1986) still impact progress for some students in small group interventions that are timed, since a slower reader will be exposed to less words relative to others within that intervention. On the flipside, this suggests that small group instruction may be less adequate for interventions based on dosage of words, which may instead require individualized instruction that is more costly and less practical. Another concern around increased sessions to meet dosage based on volume is the upper limit of what a student can manage in terms of overall instruction. Even with plenty of time and resources available, the student may reach a limit as a function of their willingness or ability gain from additional instruction. As the study by Cox & Guthrie (2001) pointed out, that faster reading results in greater enjoyment and motivation to read, it also implies that slower reading, by contrast, is not as enjoyable an activity, which may lead to compliance issues regarding longer interventions that aim to reach a total volume of words read. At the very least, this suggests a limit of effectiveness due to either resistance by students or fatigue. With slower readers, extended sessions can result in resistance to treatment and diminishing returns, either due to compliance issues or student fatigue.

Conclusion

In closing, Hammerschmidt-Snidarich and colleagues successfully extend current literature by confirming previous findings regarding CR and RR interventions to the extent that the preliminary results are statistically interpretable. The authors also raise important questions regarding how we measure reading outcomes and offer directions for future research that consider student preference, which is important regarding student motivation and reading enjoyment. The finding that either intervention is equally effective has implications particularly when factoring in compliance from the student; if the amount of eyes-on-text turns out to be more important than the type of intervention that a child is exposed to, then perhaps involving

the student in the decision-making process on the material they read is better than the alternative, particularly if some interventions are more likely to result in disengagement altogether.

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