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Reading Comprehension and Meta Comprehension in Reading from Screen Verses from Paper among Second and Fifth Grade Children

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Abstract

Whereas traditionally texts were printed and displayed on paper, technological advancements in the last decades enable reading texts on a screen. Digital reading is becoming more and more common even in schools, for educational purposes. Therefore, it is important to understand if and how the reading medium (paper versus screen) affects reading comprehension. In addition, it is important to understand how the reading medium affects the subjective evaluation of reading comprehension (meta-comprehension), which has important consequences for the effectiveness of reading self- regulation.

Several recent studies conducted with adults found screen inferiority: lower cognitive and meta-cognitive performance when reading on screen than on paper. Specifically, compared to reading texts on paper, adults reading on screen succeed less when tested on these texts, invest less time in reading, and express more over-confidence in predicting their performance (Ackerman & Goldsmith, 2011). In contrast, only few studies examined reading comprehension and meta-comprehension when reading on screen versus on paper with school age children, and their findings were inconsistent. Therefore, the purpose of the present research was to systematically examine if and how the medium used to read expository texts, screen versus paper, affects reading comprehension, meta-comprehension judgments, the accuracy of meta-comprehension judgments, and reading time among elementary school students, while comparing young readers (second graders) to older readers (fifth graders). In addition, the research examined children's computer usage habits and preferences for

on-screen versus on-paper reading and whether these are related to the effect of the medium on performance.

The research hypotheses were based on the assumption that ‘screen-inferiority’ among adults stems from adults' relatively little experience with on screen (versus on paper) reading. Therefore, the hypotheses were that the more experienced children are in using computers or similar electronic devices, due either to their age or their computer usage habits, the less screen inferiority they are expected to demonstrate. Forty-eight second-graders and 49 fifth-graders, all with proper reading and no learning disabilities, participated in the research. The students read four texts, two on screen and two on paper, and reading time for each text was recorded. For each text, the students judged how well they comprehended it and answered reading comprehension questions (on the same medium used for reading the text). In addition, the students answered questionnaires that examined their computer usage habits and preferences for reading on screen versus on paper.

Results revealed better reading comprehension when reading on paper then when reading on screen, in both age groups. Meta-comprehension judgments were higher for second graders than for fifth graders, but were not affected by the reading medium. Meta-comprehension judgments' accuracy revealed more over confidence when reading on screen than on paper, for both second and fifth graders. There were no differences in reading time on screen and on paper, for both age groups. Computer usage habits did not moderate the effect of medium. Prior to participating in the study,

students' preferred to read on screen than on paper, but this preference decreased after completing the main task.

In general, these results did not support the research hypothesis, as the effect of the medium used for reading on cognitive and metacognitive performance did not depend on age or computer usage habits. However, these findings provide a clear and solid evidence that, just as adults, elementary school children demonstrate screen inferiority, in terms of both cognitive and metacognitive performance.

The present results have important potential implications, both for future research and for the field. On the research level, whereas prior evidence was inconsistent, the present study provides clear evidence for screen inferiority among young children. Moreover, the current research was the first to examine the effect of reading medium, and to observe screen inferiority, among children as young as second graders. Specifically, the present research suggests that that the differences between on screen and on paper reading do not depend on age, computer usage habits, or medium preferences. In addition, the study suggests that the reading medium affects meta-comprehension judgments' accuracy and therefore, potentially, affects the self-regulation of reading, an issue that has not yet been studied with children. On a more practical level, the current results have important implications for the implementation of computers and other electronic devices for reading in educational settings with children. Educators should consider these findings as they select the appropriate medium for reading as a means of learning.