Predictors of Digital Reading Performance in Children and Adults

Department of PSYCHOLOGY 香港中文大學心理學系 CUHK

Jana Chi-San Ho, Catherine McBride, & Kelvin Fai-Hong Lui

Department of Psychology, The Chinese University of Hong Kong

Contact information (Presenter): Jana Chi-San Ho at hochisan@link.cuhk.edu.hk

Department of PSYCHOLOGY 香港中文大學心理學系 CUHK

Background

Print Reading versus Digital Reading

- Digital technologies deeply affect the presentation of texts and the flow of reading, and consequently, affect the nature of reading (OECD Publishing, 2011).

Features of Digital Reading

- The Presentation of Texts – The readability and usability are affected by the physical size of the display area.
- The Flow of Reading – Digital texts are non-linear and are displayed in dynamic windows and frames (OECD Publishing, 2011), which allow quicker navigation of texts. The interconnection among digital texts is accentuated.

The Affordances of Digitalization in Reading

- The physical characteristics of the digital tools that are used for reading facilitate the flow of reading. E.g., hyperlinks allow readers to navigate their way of encoding information, which traditional print reading could not afford.
- The social implications of digital reading – Some researchers argued that digital reading was more likely to lead to skimming or reading on a surface level, which was a form of inattention developed due to pathological internet usage (Carr, 2011).

Research Questions: What Variables Predict Digital Reading Performance in Children and Adults?

- Age
- Gender
- Years of English Learning
- The Type of Reading Devices

Method

The Silent Word Reading Test

1. heboymouseclasslikewalkdeskroombooklunchsleepeyebaguplook

2. shopbutsixseebirthafternightdaypenapplegirldaughtergiveearduck

3. picturenursemuchchildnaughtyfasttigerwoodladyriverourneckbadten

Figure 1. The silent word reading test.

- A 10-minute timed test of English word reading (https://wordsword.psy.cuhk.edu.hk/).
- The first half of the test includes 25 strings of random English words with progressive difficulty while the second half of the test consists of random words in strings of letters contextualized in sentences.

Participants

- Seventy children (age: M = 9.94, SD = 2.01) and 152 adults (age: M = 34.34, SD = 12.52)
- Children and adult participants were from 7 and 32 different countries, respectively. The majority of the children participants were from Hong Kong, while the majority of the adult participants were from mainland China.

Procedure

- Participants were either self-administered or assisted by a research assistant to complete the online reading test.

Measures

- **The Type of Reading Devices.** Participants were asked to use a computer, a tablet/pad or a mobile phone to complete the reading task.
- **Digital Reading Performance.** It was measured by the total number of words that were identified by participants in the reading test.

Results

Multiple linear regression was conducted on children and adult samples separately.

Predictor Variables: age, gender, years of reported English learning and the type of reading devices

Outcome Variables: digital reading performance

	Children	Adults
R^2	.587	.456
Adjusted R^2	.294	.181

Table 1. The total explained variance of the regression models of predicting digital reading performance in children and adults.

Predictors	Children β	Children SE	Adults β	Adults SE
Intercept		44.402		16.762
Age	.444***	4.304	-.234**	.451
Gender [a]	-.038	15.464	-.108	11.862
Years of English Learning	.327**	3.449	.168*	.521
Device = Phone [b]	-.266*	21.487	-.410***	11.480
Device = Tablet [c]	.009	17.207	-.101	23.706

Note. N (children) = 70, N (adult) = 152.
[a] 0 = female, 1 = male.
[b] 0 = computer, 1 = phone.
[c] 0 = computer, 1 = tablet.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 2. Results of multiple linear regression of predicting digital reading performance.

- Age was a significant positive predictor in the children sample but a significant negative predictor in the adult sample, suggesting that speeded reading performance might decline in adulthood.

- Gender did not significantly predict digital reading performance in both groups.

- The year of reported English learning was a significant positive predictor of digital reading performance in both groups.

- Reading on a phone was a significant negative predictor when compared with reading on a computer for both groups.

- Reading on a tablet (when compared with reading on a computer) did not significantly predict digital reading performance for both groups.

Discussion

Reasons for the Different Effects of Age on Digital Reading in Children and Adults

- Fluid intelligence (e.g., short-term memory) peaks early in adulthood. Therefore, reading performance speed may decline after early adulthood. As the reading test in this study is a speeded measure and involves technology that younger people are more comfortable with than older people, older adults might have performed more poorly than younger adults.

Gender Differences in Reading were Absent in Digital Reading Performance

- Wu (2014) found that girls performed better in printed reading assessment but were not significantly better on the electronic reading assessment.

The Type of Reading Devices

- Existing research findings have demonstrated a negative correlation between the size of the display screen and cognitive resources. Bigger screens have an advantage as there will be fewer scrolls and less cognitive disruption. The study of Sanchez and Wiley (2009) found that scrolling negatively affects learning from the screen and even could lower the capacity of the working memory.
- To fully understand the different effects brought by reading on a digital screen, future research should also investigate specific types of devices for digital reading and their effects on digital reading.