

A photograph of a person walking on a grassy hillside. The person is wearing a red shirt and dark shorts. The background is a dense forest of tall trees, likely pines, under a clear sky. The overall scene is bright and natural.

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Comprehension of Print and Digital Media Texts – Anticipation of Own Comprehension Performance

DOI: <https://doi.org/10.34135/mlar-24-02-10>

ABSTRACT

The aim of this paper is to identify whether a significant connection exists between anticipated own performance in the comprehension of print and digital media texts among university students. Likewise, the aim of this paper is to identify the possible differences between anticipating one's own future performance (aspirations) depending on the form of media texts (print vs. digital). The objectives stated above were broken down into several research questions. To identify the variables, we used the Slovak version of a standardized psychodiagnostic text comprehension test (Blinkhorn, 1985/1993). To identify the aspirations (anticipation of one's own performance in the area of comprehension), we used a simple ten-point self-assessment scale. Altogether 183 respondents took part in our research. When analyzing the data, we used procedures from descriptive and inductive statistics with the help of Microsoft Excel and SPSS statistical software. In agreement with our previous findings, the results showed that there are no significant differences in the comprehension of texts depending on their form – be it classic print texts or their digital counterparts. However, the results showed that male and female respondents in the examined set expected better performance in digital texts and worse performance in printed texts. These results are discussed mainly in the context of media communication and implications for experts in the field of media, journalism and editing, but also for educational practice at universities and in media education.

KEY WORDS

Aspirations. Comprehension. Digital. Media. Performance Anticipation. Print. Text. Young Adulthood.

1 Introduction and Theoretical Background

This paper is a response to the current stimuli in the media and in social practice – our aim is to identify whether a significant connection exists between anticipated own performance in comprehending media texts (print and digital) among university students. Likewise, our aim is to identify the possible differences between anticipating one's own future performance (aspirations) depending on the form of media texts (print vs. digital).

Due to the rapid development of digital technologies, and especially after the global Covid-19 pandemic, which accelerated the education of children and young adults through the use of digital technology (tablets, laptops, mobile phones), the research efforts to identify its impact on human behaviour in the area of emotions and cognition (Ogonowska, 2023) are gaining currency in professional circles. However, there is no consensus among experts on issues related to the comprehension of digital and print versions of texts. For example, it is well documented that the use of digital texts has an effect on improving fluency and reducing the number of errors when reading textbooks (e.g., Kaman & Ertem, 2018), the interactive features of digital texts have a positive effect on reading comprehension (Schwabe et al., 2022) and digital reading has also proven effective in improving reading comprehension skills (Al Khazaleh, 2021).

On the other hand, several authors (Alisaari et al., 2018; Fesel et al., 2018; Sage et al., 2019) have reported that the performance is comparable. Ben-Yehudah and Eshet-Alkalai (2021) investigated congruent and incongruent conditions of study and testing (the respondents first studied an expository text through one medium (print or digital) and then their comprehension was assessed either in the same (congruent) or another (incongruent) medium), but found no significant differences.

Some experts are of the opinion that each of the forms of media has its advantages and disadvantages. Park and Lee (2021) experimentally discovered that reading comprehension at the literal level improved the most in the group where the students used tablets. Conversely, improvements in inferential reading comprehension and grammatical knowledge were greater in those who read printed books and did not use tablets. The authors concluded that print media were better for in-depth reading and digital texts were more ideal for skimming and scanning. Some research studies identified several significant disadvantages of digital media compared to classic print media. For example, Altamura et al. (2023) found that casual digital reading does not pay off in terms of text comprehension – at least not as much as traditional reading of printed texts. Other research results (Salmerón et al., 2023) have revealed that the amount of daily use of digital devices was negatively related to the reading comprehension test scores among fourth graders. In their meta-analysis, Salmerón et al. (2024) confirmed certain negative effects of screens on the comprehension of texts compared to printed texts in schools, and they argue for the reading of printed texts in schools and to search for appropriate ways to gradually incorporate handheld digital devices for reading purposes. Likewise, the research conducted by Kazazoğlu (2020) confirmed that students who read texts in printed form achieved significantly higher scores in comprehension tests than those who only read texts digitally. Singer and Alexander (2017) also confirmed that students remembered key points associated with the main idea and other relevant information more effectively when working with printed texts. Similar results are reported by Jian (2022).

Despite the above, the data indicate that children and young people prefer digital to print media (Wąsiński et al., 2013; Singer & Alexander, 2017; Florit et al., 2023; Čábyová et al., 2023). However, these preferences are not in agreement with the forecasts – anticipation of one's own performance of text comprehension (Singer & Alexander, 2017). Bresó-Grancha et al. (2022) found that their respondents read printed texts more slowly.

In addition to printed and digital texts, some studies added audiobooks to the examination of comprehension of textual content. In this context, Singh and Alexander (2022) verified whether audiobooks tend to facilitate comprehension more than print books, especially in younger

students. On the contrary, the overall difference between reading and listening comprehension was not reliably different in the meta-analysis carried out by Clinton-Lisell (2022). However, in the case of reading at one's own pace (in contrast with the pace set by the examiner), reading proved to be more beneficial than listening. The reading method (silent vs. loud) can also have an effect on the text comprehension rate. The research conducted by Schimmel and Ness (2017) revealed that silent reading is more effective for narrative passages at the retelling rates, however, no difference was noted in the comprehension rates (different texts – expository, narrative or expository). Activities such as highlighting the text while reading (Mason et al., 2024) have an impact on the perception and comprehension of text. Goodwin et al. (2020) reported that students used highlighting and annotations more when reading text printed on paper compared to digital text. Reading on paper also slightly supported reading comprehension in longer text segments.

Jian (2022) provides stimulating information about the factors influencing the comprehension of texts in relation to the reception and tracking of eye movements while reading. The data indicate that the respondents spent approximately the same amount of time processing print and digital texts. However, the time was not divided equally between the first pass and the reread phase. The group that read the texts in digital form spent more time reading in the first reading phase and only rarely read the text again. Unlike the printed text group, which first perused the entire text and then re-read its important parts, longer fixations in the re-reading phase and a higher number of re-readings were noted. This means that reading the printed version employs different cognitive strategies and exhibits a more selective and deliberate reading behaviour. Brüggemann et al. (2023) identified differences in the cognitive load under three testing conditions (classic, with paper and pencil, test materials shown on screen and an adaptive computer test) and noted a higher rate of increase in the cognitive load when taking the adaptive computer test. Research (Schurer et al., 2020) has also shown that working memory capacity is one of the key factors determining text comprehension rate. The results also indicated that prior knowledge is a benefit in the subsequent comprehension of text despite the fact that it has no effect on the reader's attention.

The above research (with some exceptions) studies were devoted to the issue of text comprehension, especially so in the field of education and in the educational process. The tested text samples, whether digital or printed (and sometimes audiovisual), usually included teaching materials, educational materials, exercise books, fiction and manuals. Comprehension of media texts (articles from newspapers or magazines) is not significantly represented in current research despite the fact that it has significant social implications and impacts. The aim of our research, which is part of the outputs from the research project focused on text comprehension, is to contribute to fostering the expert dialog and enrich it with media-related aspects.

2 Methodology

This study is part of broader research, and this article presents three main research problems related to the comprehension of media texts aimed at the cohort of young university students.

2.1 Research Questions

RQ1: Do university students exhibit significant differences in the anticipation (or expectation) of their own future performance in media text comprehension when reading digital and print texts?

RQ2: Are there significant differences in the comprehension of digital and print media texts in the studied group of university students?

RQ3: Is there is a significant connection between anticipated or expected own performance and actual performance in the:

RQ3.1 digital;

RQ3.2 print text comprehension test?

To carry out our research with the above research problems, we designed a descriptive, mapping, correlational and comparative research plan using a standardized method, which was adapted to the digital environment, as well as a simple self-assessment scale.

2.2 Population and Sample

With regard to the objectives and research problems, our population set involves university students. According to the available statistics at the time of research planning (Ballek et al., 2021) a total of 130,739 university students studied in Slovakia. Based on the above, the required sample size is $N_{pvp} = 383$ (Conf. L 95%, Conf. I 0.05). The research was conceived more broadly – in total we tested the required number of respondents, but after excluding those who did not take part in both measurements (digital and print texts), or whose administered protocols were incomplete, only 183 respondents (121 women and 62 men) were used in the data analysis with an average age of 21.79 years ($sd=2.82$ years). The students studied several different programs (history, journalism, marketing communication, ethics, languages, philosophy, etc.) mainly at art faculties.

2.3 Method

As indicated above, we used several methods in our study. Within the methods focused on data collection and the variable defined as “Text Comprehension Rate”, we administered a standardized psychodiagnostic test – namely the verbal subtest of the Managerial Assumptions Test (Blinkhorn, 1985/1993). The Slovak version of the printed test is distributed by Psychodiagnostika. We have prepared its digital version for the purposes of the VEGA project and more broadly conceived research both in Moodle and QuestionPro. The test contained 15 media texts (ranging from personal and political to economic) and a total of 60 test items. The administration time limit was 30 minutes. Each of the 15 texts contained approximately 100 words (95.77 in Version A and 101.13 in Version B) and the average character count in Slovak was 695 (Version A) and 692 (Version B). Both parallel versions were equivalent. According to the test authors, the success rate in the tests is not dependent on any specific knowledge or technical skills. The test is focused on verbal comprehension, but it also reflects the ability to think critically (it is partly based on the Watson-Glaser Critical Thinking Assessment, conf. Wojciechowski et al., 2013; Ogonowska, 2023). At the same time, it determines whether the respondents can combine skills with practical judgment.

Before the practice run and testing itself, the respondents filled out a short questionnaire with the necessary demographic data. After the test, the respondents had the opportunity to add their own comments – in the open answer field, they listed the factors that they subjectively perceived as difficult or, conversely, easy when taking the test. This research is conceived more broadly, and this specific information is not part of the present analysis, which for example also applies to the “Text Difficulty” variable, which was measured by means of the Björnsson Index (Björnsson, 1968; Björnsson, 1983), (for more details, see, e.g., Sokol & Sokolová, 2022; Fichnová et al., 2024).

The results were processed in an Excel spreadsheet using SPSS.

3 Results

The basic descriptive data are presented in Table 1 and Table 2. A simple comparison of the averages shows that the respondents expected better performance in the comprehension of digital texts over print texts (classical printed materials) prior to the actual test, which was related to the comprehension of various media texts. However, the size of standard deviation indicates that there was a higher inter-individual variability, especially in the aspirations associated with the comprehension of print media texts in our sample. On the contrary, the monitored sample showed a higher agreement in the estimations of the respondents' own performance in the field of digital texts. The differences in expectations of their own future performance in the comprehension of digital and print texts were also confirmed by a statistical comparison of the data presented in the upper part of Table 3. The t-test significance value is .002, which means highly significant differences in the monitored variables. Therefore, our Research Question 1 (RQ1) can be answered positively: there are significant differences in the anticipation (or expectations) of one's own future performance in the comprehension of digital and print media texts in the studied group of university students in favour of better performance in digital texts.

| | Mean | Std. Deviation | Std. Error Mean |
|-----------|--------|----------------|-----------------|
| asp_print | 5.0000 | 2.02457 | .14966 |
| asp_digit | 5.4672 | 1.61773 | .11959 |

TABLE 1: Descriptive statistical data of the variable "Anticipation of own future performance in the comprehension of print (asp_print) and digital (asp_digit) media texts" in the sample of respondents
Source: own processing, 2024

The data presented in Table 2 could also confirm the stated findings in the actual performance (the arithmetic averages of the respondents' actual performance in the comprehension of media texts indicate this very finding – the score for the comprehension of digital texts is slightly higher than the score for the comprehension of print texts (26.74 vs. 25.88), however, the statistical confrontation did not confirm these considerations. The differences are not statistically significant (which is illustrated in the lower part of Table 3). These findings allow us to answer our Research Question 2 (RQ2): the comprehension of media texts is not affected by their form, whether digital or print, in the examined students and the text comprehension rate of both text types is comparable (despite the subjective expectations of better performance in the comprehension of digital texts).

| | Mean | Std. Deviation | Std. Error Mean |
|------------|---------|----------------|-----------------|
| perf_print | 25.8852 | 7.28260 | .53835 |
| perf_digit | 26.7377 | 6.52106 | .48205 |

TABLE 2: Descriptive statistical data of the variable "Text comprehension rate of digital (perf_digit) and print (perf_print) media texts" in the sample of respondents
Source: own processing, 2024

| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | t | Sig (2-tailed) |
|-------------------------|---------|----------------|-----------------|---|---------|--------|----------------|
| | | | | Lower | Upper | | |
| asp_print - asp_digit | -.46721 | 2.05395 | .15183 | -.76679 | -.16764 | -3.077 | .002 |
| perf_print - perf_digit | -.85246 | 7.56111 | .55893 | -1.95528 | .25036 | -1.525 | .129 |

TABLE 3: Statistical confrontation of the monitored variables through the t-test
Source: own processing, 2024

| | | asp_digit | perf_digit | | | asp_prin | perf_prin |
|-----------|---------------------|-----------|------------|----------|---------------------|----------|-----------|
| asp_digit | Pearson Correlation | 1 | .098 | asp_prin | Pearson Correlation | 1 | .156* |
| | Sig. (2-tailed) | | .185 | | Sig. (2-tailed) | | .035 |
| | N | 183 | 183 | | N | 183 | 183 |

*Correlation is significant at the 0.05 level (2-tailed)

TABLE 4: Results of the correlation analysis of the monitored variables

Source: own processing, 2024

These findings are indirectly and partially confirmed by the data analysis carried out in connection with Research Question 3 (RQ3), which is presented in Table 4. There is no significant relationship between expected performance – text comprehension rate – and actual comprehension (the value of the corresponding observed correlation coefficient is low) in the case of digital texts (RQ3.1).

However, we found that the low expected comprehension performance in the case of print texts is correlated with the real (and relatively) lower text comprehension rate of these texts ($r(181) = .156, p < .05$). The students' concerns about the print version may thus be derivative of the so-called self-fulfilling prophecy phenomenon (conf. King & Mertens, 2023), or equivalent to a variation of the placebo effect (Colloca, 2024). However, it should be reiterated in this context that the monitored sample exhibited a higher inter-individual variability in performance, represented by a higher standard deviation (which is also reflected in the max. and min. score of 9 and 50). However, this result also indicates that the respondents were relatively realistic in predicting their own performance. And conversely, the estimation did not correspond to the actual performance in digital texts. Another possible explanation is that the above is related to the level of experience in reading print or digital texts.

4 Research Limitations

The present research results should be interpreted with some degree of caution especially given the relatively small research sample, which was formed after filtering out all incomplete submissions and submissions that did not contain both versions of the tests (digital and print). This also applies to the composition of the sample and the prevalence of female respondents. Despite this discrepancy, the results provide an insight into certain tendencies and trends in the monitored target group.

The intervening variables should also include factors such as text coherence (see, Schurer et al., 2020), topics that may be of special interest for certain respondents (this factor will be investigated more closely in another study we are preparing), motivation to take the test (not all respondents took the test with the same degree of motivation interest), own activity (Vrabec & Bôtošová, 2020; Čábyová & Hudáková, 2022), which can, for example, include the highlighting of essential parts of text (Mason et al., 2024), perception of the medium and its reputation (Spálová & Szabo, 2017), type of device on which the respondents took the digital version of the test (including screen size, as reported by Haverkamp et al., 2023), technological skills of the respondents (Pitoňáková, 2020), different time periods for taking the tests (the print version was always administered in the morning, however, the specific start time of the test differed between the individual groups of students). The testing diversified when the digital version was administered because some respondents took it individually on their own devices outside the computer room, which could also factor in the final evaluation. Not all respondents used the entire time limit available. After the tests, the respondents had the opportunity to reflect on some of the factors that they perceived as either having a subjectively positive or negative impact on their performance. However, these data were of a relatively extensive nature, we have set

them aside for the solution of another specific research question, and their scope exceeded the possibilities of the present study. Therefore, we will deal with them in more detail elsewhere. Although the above limitations should be taken into account, the study provides an insight into the area under review and connects text comprehension with the media with a focus on university students as well as their own metacognition, which mainly includes comprehension (and the difference between digital and print texts).

5 Discussion

The present study shows that expectations, including those that young university students build on the basis through their daily use of digital technologies and the ever-increasing preference and prioritization of digital texts (be they media, educational, or even private texts in person-to-person communication), do not reflect their real performance in text comprehension. These results are consistent with the data identified by Florit et al. (2023) in the lower age cohorts – specifically young children – where the effect of the medium on text comprehension was independent of the children's medium preference.

Our finding that there is no significant relationship between expected performance in text comprehension and actual text comprehension in the case of digital texts, is in slight contradiction with the findings of Singer Trakhman et al. (2023). These researchers have confirmed that text comprehension was overestimated more often when the students read digital multimodal texts.

As confirmed by our analyses, the comprehension performance in print and digital media texts is comparable, which corresponds to the data presented by other authors who focused on educational texts (Alisaari et al., 2018; Fesel et al., 2018; Sage et al., 2019). Similar results were also confirmed in our previous work (Fichnová et al., 2024). These findings are important not only for the understanding of processes in media communication and its impact on the target groups of young people who continue their educational process and prepare for the professions requiring higher education even at a young adult age, but also in the field of media education and journalism (Kačínová & Vrabc, 2022). Our current research is also focused on the analysis of the relationship between the length and complexity of media texts and their impact on comprehension, since the comprehension factors cannot be reduced to the mere form of presentation (print vs. digital text) and must be viewed as a more complex phenomenon. As stated above, researchers have not yet come to a clear agreement when comparing the comprehension performance of digital and print versions of texts. In contrast to our results, the below group of authors identified higher text comprehension rates and other significantly more positive effects when reading digital and not printed texts (Kaman & Ertem, 2018; Al Khazaleh, 2021; Schwabe et al., 2022) but another group of authors highlight the positives of print texts and their impact on comprehension compared to digital texts (Singer & Alexander, 2017; Goodwin et al., 2020; Kazazoğlu, 2020; Jian, 2022; Salmerón et al., 2024). These discrepancies are most probably caused by several factors, such as the researchers' use of different research strategies and methods to measure text comprehension (educational tests, psychodiagnostic tests, scales, open-ended questions...), different time allowances for reading, but also the inclusion of tasks in which the respondents were to demonstrate text comprehension, and, last but not least, respondents' age (ranging from small children, through pubescents and adolescents to adults). Even the text itself is far from negligible – as stated above, the vast majority of cited works concentrated on educational texts, educational materials and textbooks. Similarly, the texts were most likely of different lengths and difficulty and their language versions and textual specificities also must have played a significant role.

6 Conclusion

The present study builds on our previous analyses (Fichnová et al., 2024) and confirms that:

- young university students under our language conditions show no significant differences in the comprehension of print and digital media texts (articles from periodicals, magazines and websites);
- on the contrary, the subjective perception and expectation of one's own comprehension of media texts in this age cohort and specific group (higher education) significantly favours digital over printed texts;
- in the case of digital versions of media texts, no connection was found between the expected comprehension performance of these texts and the actual text comprehension rate among university students;
- in contrast, the expected average to lower-than-average performance in the comprehension of print versions of texts corresponds to the lower text comprehension rate of print media texts identified in the monitored research sample.

The presented analyses do not reflect other contextual factors that may be related to the text comprehension rate of media texts, such as motivational factors, preferred topics (it is a reasonable assumption that texts that contain topics that mean something to the test subject will be perceived with a higher degree of attention and interest, and therefore will be easier to understand), reader's cognitive style and other variables. Some of the listed variables have been the subject of our analyses and published in other academic studies.

Our research indicates that the digital and print versions of media texts can be perceived as equivalent in the investigated target group, and – as suggested by other authors – they can even be classed as complementary. The popularity of and/or preference for digital over printed texts will most probably continue to rise, which should be reflected both in the educational process and in journalistic, media, publishing, librarial, marketing and communication practice.

Acknowledgement: This study is one of the outputs of the VEGA (Scientific Grant Agency of the Slovak Republic) project no. 1/0650/22, project name: Mass-media communicated in digital and printed form and their comprehension by various target groups.

Bibliography

- Altamura, L., Vargas, C., & Salmeron, L. (2023). Do new forms of reading pay off? A meta-analysis on the relationship between leisure digital reading habits and text comprehension. *Review of Educational Research*, 0(0). <https://doi.org/10.3102/00346543231216463>
- Alisaari, J., Turunen, T., Kajamies, A., Korpela, M., & Hurme, T.-R. (2018). Reading comprehension in digital and printed texts. *L1-Educational Studies in Language and Literature*, 18(1), 1-18. <https://doi.org/10.17239/L1ESLL-2018.18.01.15>
- Al Khazaleh, S. (2021). The effect of digital reading on EFL learners' reading comprehension. *International Journal of Education, Technology and Science*, 1(1), 59-70. <https://ijets.org/index.php/IJETS/article/view/6>
- Ballek, A., Adamec, Š., Cerulíková, A., Danko, P., Chrappa, I., Illiřová, A., Ivančíková, L., Kolesárová, L., Mravcová, M., Novotná, E., Ridzoňová, A., Syneková, I., Šlachtová, N., & Török, R. (2021). *Štatistická ročenka Slovenskej republiky. Statistical yearbook of the Slovak Republic*. VEDA. https://slovak.statistics.sk/wps/wcm/connect/56e949a1-bd5b-4210-adc7-5e8e8323de46/Statisticka_rocenska_2021_ebook.pdf?MOD=AJPERES

- Ben-Yehudah, G., & Eshet-Alkalai, Y. (2021). Print versus digital reading comprehension tests: Does the congruency of study and test medium matter? *British Journal of Educational Technology*, 52(1), 426-440. <https://doi.org/10.1111/bjet.13014>
- Björnsson, C. H. (1968). *Läsbarhet*. Liber.
- Björnsson, C. H. (1983). Readability of newspapers in 11 languages. *Reading Research Quarterly*, 18(4), 480-497. <https://doi.org/10.2307/747382>
- Blinkhorn, S. F. (1993). *T-42 hodnotenie manažérskych predpokladov – GMA* (T. Kollárik, E. Kováčová, M. Kuklišová, L. Urminská, & A. Ritomský, Trans.). Psychodiagnostika. (Original work published 1985)
- Bresó-Grancha, N., Jorques-Infante, M. J., & Moret-Tatay, C. (2022). Reading digital-versus print-easy texts: A study with university students who prefer digital sources. *Psicologia: Reflexão e Crítica*, 35(1). <https://doi.org/10.1186/s41155-022-00212-4>
- Brüggemann, T., Ludewig, U., Lorenz, R., & McElvany, N. (2023). Effects of mode and medium in reading comprehension tests on cognitive load. *Computers & Education*, 192, 104649. <https://doi.org/10.1016/j.compedu.2022.104649>
- Clinton-Lisell, V. (2022). Listening ears or reading eyes: A meta-analysis of reading and listening comprehension comparisons. *Review of Educational Research*, 92(4), 543-582. <https://doi.org/10.3102/00346543211060871>
- Colloca, L. (2024). The placebo effect. *Annual Review of Pharmacology and Toxicology*, 64, 171-190. <https://doi.org/10.1146/annurev-pharmtox-022723-112425>
- Čábyová, L., & Hudáková, V. (2022). Social media use and adolescents' levels of advertising literacy. *Media Literacy and Academic Research*, 5(2), 147-163. https://www.mlar.sk/wp-content/uploads/2022/12/9_L%20%95%A0iudmila-C%20%95%A0ia%20%95%A0ub yova%20%95%A0u_Vikto%20%95%A0uria-Huda%20%95%A0ukova%20%95%A0u-.pdf
- Čábyová, L., Hudíková, Z., Rozukalne, A., Skulte, I., & Stakle, A. (2023). Family news talks: Deliberative communication in families. *Media Literacy and Academic Research*, 6(2), 22-54. <https://doi.org/10.34135/mlar-23-02-02>
- Fesel, S. S., Segers, E., & Verhoeven, L. (2018). Individual variation in children's reading comprehension across digital text types. *Journal of Research in Reading*, 41(1), 106-121. <https://doi.org/10.1111/1467-9817.12098>
- Fichnová, K., Wojciechowski, Ł. P., Štrbová, E., & Janková, G. (2024). Digital and print media texts and their comprehension by young adults – preliminary research results. *Annales Universitatis Paedagogicae Cracoviensis | Studia de Cultura*, 16(2), 33-49. <https://doi.org/10.24917/20837275.16.2.3>
- Florit, E., De Carli, P., Rodà, A., Domenicale, S., & Mason, L. (2023). Precursors of reading text comprehension from paper and screen in first graders: A longitudinal study. *Reading and Writing*, 36(7), 1821-1843. <https://doi.org/10.1007/s11145-022-10327-w>
- Goodwin, A. P., Cho, S.-J., Reynolds, D., Brady, K., & Salas, J. (2020). Digital versus paper reading processes and links to comprehension for middle school students. *American Educational Research Journal*, 57(4), 1837-1867. <https://doi.org/10.3102/0002831219890300>
- Haverkamp, Y. E., Bråten, I., Latini, N., & Salmerón, L. (2023). Is it the size, the movement, or both? Investigating effects of screen size and text movement on processing, understanding, and motivation when students read informational text. *Reading and Writing*, 36(7), 1589-1608. <https://doi.org/10.1007/s11145-022-10328-9>
- Jian, Y. C. (2022). Reading in print versus digital media uses different cognitive strategies: Evidence from eye movements during science-text reading. *Reading and Writing*, 35(7), 1549-1568. <https://doi.org/10.1007/s11145-021-10246-2>

- Kačínová, V., & Vrabec, N. (2022). Modelos de alfabetización mediática para apoyo a la ciudadanía dentro del ámbito de las desinformaciones: Aplicación en proyectos educativos y plataformas online eslovacas. In I. Aguaded, A. Vizcaíno-Verdú, A. Hernando-Gómez, & M. Bonilla-del-Río (Eds.), *Redes sociales y ciudadanía* (pp. 1109-1119). Grupo Comunicar Ediciones. <https://doi.org/10.3916/Alfamed2022>
- Kaman, S., & Ertem, I. S. (2018). The effect of digital texts on primary students' comprehension, fluency, and attitude. *Eurasian Journal of Educational Research*, 18(76), 147-164. <https://dergipark.org.tr/en/pub/ejer/issue/42543/512635>
- Kazazoğlu, S. (2020). Is printed-text the best choice? A mixed-method case study on reading comprehension. *Journal of Language and Linguistic Studies*, 16(1), 458-473. <https://doi.org/10.17263/jlls.712879>
- King, O. C., & Mertens, M. (2023). Self-fulfilling prophecy in practical and automated prediction. *Ethical Theory and Moral Practice*, 26, 127-152. <https://doi.org/10.1007/s10677-022-10359-9>
- Mason, L., Ronconi, A., Carretti, B., Nardin, S., & Tarchi, Ch. (2024). Highlighting and highlighted information in text comprehension and learning from digital reading. *Journal of Computer Assisted Learning*, 40(2), 637-653. <https://doi.org/10.1111/jcal.12903>
- Ogonowska, A. (2023). Cyberpsychology and media studies: Contemporary research directions and sources of mutual inspiration. *Roczniki Psychologiczne*, 26(4), 315-330. <https://doi.org/10.18290/rpsych2023.0017>
- Park, J., & Lee, J. (2021). Effects of e-books and printed books on EFL learners' reading comprehension and grammatical knowledge. *English Teaching*, 76(3), 35-61. <https://doi.org/10.15858/engtea.76.3.202109.35>
- Pitoňáková, S. (2020). The world of media has been changed (?) by the black swan. In Z. Kvetanová, & M. Solík (Eds.), *Megatrends and media: On the edge* (pp. 82-93). Faculty of Mass Media Communication, University of Ss. Cyril and Methodius.
- Sage, K., Augustine, H., Shand, H., Bakner, K., & Rayne, S. (2019). Reading from print, computer, and tablet: Equivalent learning in the digital age. *Education and Information Technologies*, 24, 2477-2502. <https://doi.org/10.1007/s10639-019-09887-2>
- Salmerón, L., Vargas, C., Delgado, P., & Baron, N. (2023). Relation between digital tool practices in the language arts classroom and reading comprehension scores. *Reading and Writing*, 36(1), 175-194. <https://doi.org/10.1007/s11145-022-10295-1>
- Salmerón, L., Altamura, L., Delgado, P., Karagiorgi, A., & Vargas, C. (2024). Reading comprehension on handheld devices versus on paper: A narrative review and meta-analysis of the medium effect and its moderators. *Journal of Educational Psychology*, 116(2), 153-172. <https://doi.org/10.1037/edu0000830>
- Schimmel, N., & Ness, M. (2017). The effects of oral and silent reading on reading comprehension. *Reading Psychology*, 38(4), 390-416. <https://doi.org/10.1080/02702711.2016.1278416>
- Schurer, T., Opitz, B., & Schubert, T. (2020). Working memory capacity but not prior knowledge impact on readers' attention and text comprehension. *Frontiers in Education*, 5. <https://doi.org/10.3389/feduc.2020.00026>
- Schwabe, A., Lind, F., Kosch, L., & Boomgaarden, H. G. (2022). No negative effects of reading on screen on comprehension of narrative texts compared to print: A meta-analysis. *Media Psychology*, 25(6), 779-796. <https://doi.org/10.1080/15213269.2022.2070216>
- Singer, L. M., & Alexander, P. A. (2017). Reading across mediums: Effects of reading digital and print texts on comprehension and calibration. *The Journal of Experimental Education*, 85(1), 155-172. <https://doi.org/10.1080/00220973.2016.1143794>
- Singer Trakhman, L. M., Alexander, P. A., & Sun, Y. (2023). The effects of processing multimodal texts in print and digitally on comprehension and calibration. *The Journal of Experimental Education*, 91(4), 599-620. <https://doi.org/10.1080/00220973.2022.2092831>

- Singh, A., & Alexander, P. A. (2022). Audiobooks, print, and comprehension: What we know and what we need to know. *Educational Psychology Review*, 34(2), 677-715. <https://doi.org/10.1007/s10648-021-09653-2>
- Sokol, A., & Sokolová, J. (2022). Uplatňovanie pojmov čitateľnosť a zrozumiteľnosť, náročnosť a obťažnosť vo vzťahu k textu. *Jazyk a kultúra*, 13(52), 71-80. https://www.ff.unipo.sk/jak/52_2022/Augustin_Sokol_Jana_Sokolova_studia.pdf
- Spálová, L., & Szabo, P. (2017). Media image of the refugee issue in main quality newspapers SME and Mladá Fronta Dnes. In A. Cibula, M. Klenka, & E. Vlková (Eds.), *Conference proceedings of the 18th International scientific conference International relations 2017: Current issues of world economy and politics* (pp. 909-919). Ekonóm.
- Wąsiński, A., Szyszka, M., & Tomczyk, Ł. (2013). Netoholism from the perspective of educational units management staff. *Technológia Vzdelávania*, 21(4).
- Vrabec, N., & Bôtošová, Ľ. (2020). The concept of learning-by-doing in the context of media education and school quality assessment. *Communication Today*, 11(1), 140-149. <https://communicationtoday.sk/the-concept-of-learning-by-doing-in-the-context-of-media-education-and-school-quality-assessment/>
- Wojciechowski, Ł. P., Mikuláš, P., & Štrbová, E. (2013). *Masmediálna komunikácia – vybrané aspekty*. UKF.

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