Exploring the role of L1 reading ability when reading in L2

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Abstract

The present research is devoted to the study of the role of L1 (Russian) reading ability when reading in L2 (English). The text comprehension was assessed using a question and answer technique and a keywords method (Murzin, Stern 1991). Q&A results analysis did not reveal differences between the number of correct answers to questions for different texts in the same language and the same texts in different, however, a significant difference in comprehension of one of the texts in L1 and another one in L2 was found. It is assumed that this difference is due to a combination of text content and text language factors. Comparison of a set of keywords will allow us to evaluate this contribution of these factors more specifically.

Keywords: reading, text comprehension, L2, question and answer technique, keywords method

Introduction

The study of the mechanisms of reading and text comprehension is one of the main topics of experimental linguistics. This topic is essential for the construction of theoretical models of speech perception and in the development of reading theory. Text comprehension includes the construction of an abstract meaning based on the decoding of linguistic material, as well as the integration of new information and background knowledge into the mental text representation (Borisenko, Shulekina 2021). The success of text comprehension is influenced by many factors, such as reader characteristics (age, reading experience, reading disorders, etc.), text characteristics (complexity, text format, genre), etc. The role of the language system in text processing is well studied in psycholinguistics, pedagogy, psychology, neurophysiology, however, the role on language in text comprehension needs further exploration. L2 reading studies claim that L2 language knowledge, L1 reading ability, strategic knowledge, and background knowledge contribute to reading comprehension, emphasizing the need to study each factor as independent (McNeil 2012).

Materials

The material of the study was two pairs of non-fiction prosaic texts from (Kuperman et al. 2022), one text tells the story of the origin and meaning of the shaka gesture ('Shaka'), the second is about the god Janus ('Janus').
Russian and English texts readability indices were close (see Table 1 below). The text readability was assessed using readable.com (English) and readability.io (Russian) services.

Participants

114 native speakers of Russian (94 female, age 18–59, M_{age} = 22.91) took part in the experiment. All participants speak English at the level B2–C2 (B2 – 66 participants, C1 – 38 participants, C2 – 7 participants, 3 participants did not report their language level). The participants determined the language level themselves, based on their competencies. In addition, participants reported the number of years they have been learning English (M = 13.14).

Method

Participants were asked to read two texts in L1 and L2, write out 10 keywords from the texts, and answer 8 questions on the content of the text: 2 multiple choice questions, 2 questions that require a detailed answer, and 4 general questions. While answering the questions the participant could not return to the text. The keywords were defined for participants as 'words from the text that are most important in terms of the text content'.

Each participant assessed the subjective complexity of the text on a scale from -3 to 3 (for ease of analysis, the scale was converted to seven points, where – the easiest text, 7 – the most difficult).

The method of keywords extraction and analysis is described in [Murzin, Shtern 1991]. A group of participants is asked to write out keywords from the text. Each of the participants will extract their own set of keywords. Some words will be common, some will be different, which is due, on the one hand, to the same understanding of the text, and on the other hand, to the individual differences in the understanding of both the content of the text and the task of indexing.

For each word that appears in the answers, you can determine the absolute frequency of occurrence (*m*), as well as the relative frequency of occurrence (*p*): $p = m / n$, where n is the number of participants. The group of words that received the highest relative frequency of occurrence constitutes the "true" set of keywords.

Results and discussion

In this paper, only quantitative data will be analyzed (see Table 1).

Table 1. Characteristics of texts and average values of participants' answers.

Text	Language	Flesch-Kincaid Grade level	SMOG formula	Correct answers	Subjective complexity rate
Janus	English	10.40	12.70	6.46	3.07
Janus	Russian	8.98	9.73	6.91	2.39
Shaka	English	14.00	15.90	6.72	2.93
Shaka	Russian	14.51	13.42	7.20	2.16

A correlation was found between the number of correct answers to questions to texts on L2 and the level of L2 proficiency (Spearman's rho = 0.411, $p < 0.001$), as well as the number of years of studying L2 (Spearman's rho = 0.199, $p < 0.038$). Some studies suggest that there is a positive correlation between L2 proficiency and academic performance, others say that the relationship is not significant (see Al-Busaidi 2021 for a review). The discrepancy in findings may be since there is no clear definition of the concepts of language proficiency and academic achievement, variations in research design and data collection techniques and other reasons.

All texts in a foreign language were evaluated more difficult than texts in their native language ($t = 4.38$, $p < 0.001$). No statistically significant correlation was found between the subjective text complexity assessment and readability indices (Spearman's rho = -0.07, $p = 304$ for Flesch-Kincaid; Spearman's rho = 0.059, $p = 0.381$ for SMOG), which can be explained by two reasons: either the shortcomings of the readability index formulas for different languages, or the fact that the complexity of the text is a more voluminous concept than readability and is not directly related to readability (Hiebert 2011).

Analysis did not reveal differences between the number of correct answers to questions for different texts in the same language ($p_{Tukey} = 0.493$, $p_{Tukey} = 0.671$) and the same texts in different languages ($p_{Tukey} = 0.292$, $p_{Tukey} = 0.449$), however, a significant difference in comprehension of one of the texts in L1 and another one in L2 ($p_{Tukey} = 0.021$) was found. It is assumed that this difference is due to a combination of text content and text language factors. A similar result was obtained for subjective assessments of complexity: the most complex text was Janus in English, and the easiest was Shaka in Russian. Janus in Russian and Shaka in English were rated the same ($p_{Tukey} = 0.104$).

In a further study, it is planned to analyze the keywords extracted by the participants when reading the text on L1 and L2. Comparison of sets of keywords can, firstly, assess the text comprehension skill on L1 and L2 in more detail, and secondly, describe more specifically the contribution of language processing to text comprehension.

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