

The Perceived and Measured Difficulty of Texts and Tasks in L1 and L2

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Abstract

The study investigates the effect of the perception of text and task difficulty on adults' performance in reading tests in L1 and L2. The relationship between the following variables is studied: (a) readers' perception of text and task difficulty in L1 and L2 measured in a self-reported post-task questionnaire, (b) the number of correct answers to the reading tasks, (c) time spent on the task in each language, (d) the number and mean duration of fixations on areas of interest assigned to texts and each of four different task instructions as measured by an eye tracker. The study shows that for readers at an intermediate level of L2, the perceived and measured text and task difficulty is higher for L2, which results in longer mean fixation durations and a higher number of fixation counts. Tasks placed lower on the difficulty scale based on the 7-point scale of reading ability by Khalifa and Weir (2009) are prone to be treated by readers as typical of a specific task format and receive less attention, which often leads to incorrect answers.

Keywords: task difficulty, task complexity, text difficulty, L1 and L2 reading, eye-tracking, task formats, cross-linguistic factors

Most research on L2 reading relies on models that describe reading as an interaction between lower-level and higher-level processes (Alderson, 2000; Grabe, 2009; Koda, 2005). Nevertheless, these interactive models do not consider cross-linguistic factors, such as the differences between L1 and L2 reading texts and tasks regarding their complexity and difficulty, which we attempt to examine in the present study. The importance of L1 literacy in reading in L2 is stressed in Bernhardt's (2011) compensatory reading model, in which the author proposes that L2 language knowledge accounts for just 30% of a reader's comprehension of texts in L2, whereas L1 literacy accounts for 20%, and unexplained variance — including comprehension strategies, domain knowledge, and engagement — for 50%. The present research expands the engagement component by exploring students' perceptions regarding text and task difficulty, as these perceptions might determine the choice of strategies for processing the texts and tasks in L1 and L2 (Horiba, 2013; Kaakinen & Hyönä, 2005; McCrudden et al., 2005; Schmitt, 2005; Sheorey & Mokhtari, 2008).

Inspired by Zhang's (2018) study into strategy use and reading test performance aimed to improve teaching reading comprehension for better performance in EFL tests, we conducted a

study examining the differences and similarities between L1 and L2 reading processes of texts and tasks. Zhang (2018) found that effective comprehenders can skillfully use metacognitive strategies and are generally more aware of how to use reading strategies effectively. Strategies, perceived as specific reading task processing patterns developed in L1 throughout years of reading texts in a natural setting of work and leisure, can be transferred to L2 (Kong, 2006; Talebi, 2013). Such transfer might be promoted through classroom strategic instruction in reading comprehension and subsequently in reading task design when adjusting the task's actual and perceived difficulty level for a particular group of students.

Text difficulty has been studied by Bahmani and Farvardin (2017) in reference to its impact on the level of anxiety in L2 reading comprehension. Similarly, the impact of reading anxiety on reading test results in L2 was investigated by Zhao et al. (2013) and Mikami et al. (2018); however, there are only a few studies examining the perception of text and task difficulty in both L1 and L2 and their impact on reading test results. Liao's (2021) research focused on how learners dealt with multiple-choice and short-answer formats, suggesting that different strategies are employed when dealing with each of these formats. The participants' strategy use indicated that interactive processes — as the author refers to the interdependence between the comprehension task format and the processing of the text by the reader — may exist between texts and comprehension questions. However, the specific processes involved in completing multiple-choice and short-answer questions varied, depending on whether the participants considered the tasks problem-solving or knowledge-gaining.

Understanding the predicted gap between perceived difficulty and measured complexity of texts and tasks in L1 and L2 requires examining it from as many angles as possible, including eye-tracking insights. These two features of both the text and task have previously been regarded as separate items. Robinson (2001) identified task difficulty as a perception of the task performer and task complexity as inherent features of the task, which may either increase or decrease cognitive demands on the learner, affecting their performance. The interconnectedness of the two terms will be demonstrated by the present research.

The Hypothesis We Test

The hypothesis tested in our study holds that different perceived difficulty levels of the tasks will trigger different attention levels and different eye movement patterns. Texts and tasks subjectively perceived as easy should be read less carefully — with shorter mean total fixation durations and a lower number of fixations on the AoIs (Areas of Interest) with the task, which in the case of any misconception about the objective task complexity will lead to comprehension errors due to hasty reading. Tasks perceived as totally incomprehensible and far too difficult to do might make the readers skip them and move to another one without making an attempt to solve them. Texts and tasks perceived by students as tricky but manageable should, in turn, motivate them to read more carefully, which is a characteristic exhibited by both longer mean total fixation durations and a higher number of fixations on the AoIs with the particular task.

Task Difficulty and Complexity in L1 and L2

The discussion on task difficulty and complexity needs to start from the text that a comprehension task refers to. There are two ways to analyze text difficulty — objectively and

subjectively. The former involves employing a set of readability formulas — algorithms used to calculate text readability, an overview of which is presented by Benjamin (2012). As part of the latter, the perceived level of difficulty is analyzed. It contains a specific reading attitude, considered a cognitive domain of learners' personal and evaluative beliefs about reading (Mizokawa & Hansen-Krening, 2000; Smith, 1990; Yamashita, 2004). Widyantoro et al. (2022) juxtaposed objective text difficulty as measured by readability formulas with subjective student perception of the level of difficulty of selected texts in English as L1 and found out that there is a difference between them, which depends on such student individual factors as their experience, familiarity with the text type and topic as well as their perceived mastery of grammar and vocabulary.

Subjective Perceptions of Text Difficulty

In our study, we investigate the subjective perceptions of difficulty of both L1 and L2 texts, following Koda's (2005) claim that reading in an L2 is a complex phenomenon involving two languages: L1 and L2. This cross-linguistic aspect of reading also refers to reading tasks and their format. As Bunch et al. (2014) indicated, L2 reading shares many features with L1. Several studies have examined structural links between first- and second-language reading comprehension (Bernhardt, 2011; Brantmeier et al., 2014; Jeon & Yamashita, 2014). Consequently, Koda (2007) suggests that L2 reading research should focus on understanding how reading in L1 and L2 interact during L2 reading. Besides, there are not many reports about the attitudes toward L1 and L2 reading (Brevik et al., 2016; Yamashita, 2004; Yamashita, 2007). To investigate the interrelation between L1 and L2 in the domain of the perceived and displayed reading difficulty, we examined the perceived difficulty of texts in both L1 and L2 along with the scores in a reading comprehension test consisting of doing a few tasks for each text, the readers' subjective perception of the task difficulty, and data collected from an eye-tracking recording of the participants' reading activity while performing the tasks.

Displayed Reading Difficulty: Eye-tracking

Eye-tracking research on L1 showed that when reading English, readers' eye fixations last about 200–250ms, the mean saccade length is 7–9 letter spaces, and 10–15% of the saccades are regressions (Rayner, 1998). In our research, we compare the cognitive load involved in completing a task in L1 and L2 by using such eye-tracking measures as dwell time, mean fixation duration, and total fixation count. The dwell time may indicate “processes that occur in the initial stages of sentence processing” (Clifton et al., 2007, p. 349), such as word recognition or lexical access. Total fixation duration, which involves the total number of fixations in an AoI, is a general picture of the overall cognitive load and familiarity with words. The final measure is fixation count (number of visits in the same AoI) may either indicate a high level of interest or difficulty with comprehension (Godfroid, 2019). The above-listed measures are instrumental in our research as the regions of analysis are prominent on the screen (the text itself and the tasks — all of them are discrete areas of interest), and they are commonly used in reading assessment (Bax, 2013; Brunfaut & McCray, 2015).

Teasing Apart Task Difficulty and Complexity

In defining task difficulty, a clear distinction must be made between task complexity and task difficulty. According to Skehan and Foster (1997) and Skehan (1998), task complexity can be

assessed in terms of three components: code complexity, cognitive complexity, and communicative stress. Code complexity involves factors such as linguistic complexity and variety and vocabulary load and variety. A task's cognitive complexity can be described as cognitive familiarity with it (e.g., familiarity with the topic or task type) or cognitive processing. Performance conditions — such as time limits and text length — constitute communicative stress (Skehan & Foster, 2001). According to Robinson (2001), “task complexity is the result of the attentional, memory, reasoning, and other information processing demands imposed by the structure of the task on the language learner” (p. 29). Kuiken and Vedder (2007) explain task difficulty as “learners’ perceptions of the demands made by certain tasks and determined by the abilities (intelligence, working memory, language aptitude) and affective responses (e.g., anxiety, motivation, confidence) the learners bring to the task” (p. 120). Thus, the learner may perceive a task as challenging despite not being complex and vice versa.

The complexity of tasks can be divided into lower-level and higher-level processes. Low-level processing involves recognizing the text's written words and the relevant grammar information, which relies on automatic word recognition (decoding words and associating graphemes to phonemes), which is the foundation for higher-level processing. As readers process what they read, meaning is created by analyzing the information in the text, their understanding of language and content, and their skills in interpreting what they read (Alderson, 2000; Bernhardt, 2011; Grabe, 2009).

Reading Comprehension Test Item Formats and Processing Levels

Readers' comprehension is checked by several formats that also need to be considered in L2 reading research. The majority of reading assessment formats collected and classified by Grabe (2009, p. 359), based on the study of Alderson (2000), Hughes (2003) and Ashton (2003), include the following: cloze; gap-filling formats (rational cloze formats); C-tests (retain initial letters of words removed); cloze elide (remove extra word), text segment ordering, text gap; choosing from a “heading bank” for identified paragraphs; multiple-choice; sentence completion; matching (and multiple matching) techniques; classification into groups; dichotomous items (T/F/not stated, Y/N); editing; short answer, free recall; summary (1 sentence, 2 sentences, 5–6 sentences); information transfer (graphs, tables, flow charts, outlines, maps); project performance; skimming and scanning. The above-listed task formats can be used interchangeably to measure a variety of aspects regarding reading comprehension, such as implication, opinion, main idea, detail, attitude, cohesion, coherence, text structure, global meaning, comparison, and reference (Razı & Çubukçu, 2014).

Each of the above-listed formats might refer to a different level of processing following the 7-point taxonomic scale of reading ability (from the lowest to the highest-level processes) suggested by Khalifa and Weir (2009). Lower-level processes become highly automated, which means they do not require conscious processing, and in eye-tracking, they will receive fewer fixations, and these fixations will be shorter. They involve word recognition, lexical access, syntactic parsing, and establishing propositional meaning. The process of word recognition consists of recognizing the written symbols (orthographic processing), sounding out the words in the mind (phonological processing), and considering the expectations of the grammatical form (morphological processing). Lexical access refers to retrieving information about a word from the vocabulary stored in the reader's mind (the mental lexicon) to determine a word's meaning. In syntactic parsing, the term is integrated at the clause level while grammatical information is extracted from the text. During the above-described

processes, clauses, and sentences are transformed into meaning units, establishing propositional meaning.

High-level functions include inferencing, building mental models, creating a text representation, and creating an intertextual representation. To understand the text, readers may use their own knowledge of the world, the topic, and the text itself — called inferencing. They build a mental model when they integrate individual propositions into the overall meaning framework of the text. By creating a text-level representation, a reader can construct a text as a hierarchy of propositions, allowing the differentiation between the main points and gist of the text and its details. Lastly, information from several texts can be combined to build an intertextual representation.

It is proposed by Clifton et al. (2007) that the early measures, such as single fixation duration and total fixation duration, might be useful to indicate “processes involved in sentence processing” (p. 349), such as lexical access and word recognition. The fixation duration is influenced by “corpus-derived word frequency, word familiarity, lexical ambiguity, morphological effects, contextual constraints, and plausibility” (Brunfaut & McCray, 2015, p. 9). According to Godfroid (2019), measures of total time and dwell time represent relatively late stages of processing and may suggest that normal reading has been disrupted. The inflated measures of total and dwell time may be due to difficulty identifying a word within a sentence, according to Frenck-Mestre (2005) and Winke et al. (2013).

In terms of task format, we refer to the text response format patterns and the scope of the task (Liao, 2019), i.e. the perception of the task that influences the strategy choice (Joh & Schallert, 2014). Thus, the response format impacts test performance, i.e., if the student is accustomed to the multiple-question format, teachers should be cautious in administering short question formats or summary writing in order not to introduce extra difficulty (e.g., Bachman & Palmer, 1996; Kobayashi, 2002). Therefore, reading comprehension task formats should attempt to incorporate recognizable response formats in parallel reading tests that consider the appropriate difficulty level for both reading ability and task format.

Research Questions and Variables

In the present study, we attempt to answer the following research questions:

- RQ1: How do the perceived difficulty and measured complexity of texts and tasks in L1 and L2 differ?
- RQ2: How does the students' perception of the texts' and tasks' difficulty affect their comprehension test results in L1 and L2?

To find the answers, the following variables measured by the accompanying instruments are taken into consideration:

1. The readers' perception of the difficulty level of selected standardized reading texts and tasks in L1 and L2 presented in a self-reported questionnaire;
2. The readers' accuracy in task completion as displayed in their reading test results;

3. The eye-tracked degree of the readers' concentration to do a particular comprehension task as shown by such measures of their oculomotor behavior as total fixation duration, fixation counts, as well as a dwell time on the designated area of interest (AoI) for the text and each task.

The study is based on the data collected by three leading research tools: a) eye-tracked performance of reading comprehension tasks in L1 and L2; b) post-task questionnaire; and c) reading comprehension test results. The data collected in this way underwent the following scheme of analysis. First, the results of the post-task questionnaire were analyzed to learn which tasks were perceived by the participants as most problematic. Second, the correctness of the answers in the reading test was checked and juxtaposed with the data collected from the eye-tracking recording.

Method

Participants

Students of a general English language course at an A2-B1 level at one of the Universities of the Third Age in Poland were invited to participate in the study. Sixteen females volunteered (age range 58–70 years; $M = 65.47$ years). All of them are university graduates in various fields (architecture, chemistry, economics, engineering, and psychology), utilizing their highly-developed reading skills in L1 throughout the whole period of their professional careers. They identified reading in L1 (Polish) as one of their favorite leisure activities at retirement. Each of them was at an approximately A2–B1 proficiency level in English. For all, it was the first time when they had an opportunity to read with an eye-tracker. The participants were appointed for 15-minute recording sessions, during which they performed reading comprehension tasks for texts in L1 and then in L2.

Reading Comprehension Test Texts and Tasks

The readability of both four-paragraph expository texts was tested, applying two text analysis tools: *jasnopis.pl* and *textinspector.com* for L1 and L2, respectively, with the Gunning Fog Index (a formula measuring an estimated education level in years required to understand a text) scores of 12.56 for L1 and 10.25 for L2. The scores of 12.56 for L1 and 10.25 for L2 indicate that most high school graduates would be able to comprehend the texts easily. The Polish text was adapted from a popular science newspaper *Świat Wiedzy [The World of Knowledge]*, 1/2013; difficulty level: 3/7 (an easy text — comprehensible for an average Pole). The English text was adopted from an EFL coursebook by Taylor (2004) at the A2 level. The topics of these passages centered on social phenomena, business, sport, and science. The average length of each reading passage was about 300 words.

Both L1 and L2 tasks included four-paragraph reading texts followed by five comprehension questions each. The tasks accompanying the texts varied in difficulty according to the scale proposed by Khalifa and Weir (2009). The comprehension questions consisted of five tasks of five different formats: paragraph matching for general inferencing (GI), gap-filling for lexical access (LA), multiple choice for specific inferencing (SI), true–false for propositional encoding (PE), and short question answer for syntactic parsing (SP). Appendix A presents the stimulus material in L2 with the task types indicated according to Khalifa and Weir (2009), which corresponds in layout with the L1 stimulus.

In order to ensure reading comprehension test validity and reliability the following steps were taken. Firstly, an English studies lecturer speaking Polish as L1 was presented with the questions to both texts and was unable to answer them until reading the texts. The content validity was established by designing tasks testing a variety of reading subskills in a diversity of formats. Face validity was maintained by preparing text and task formats found in the participants' English coursebooks. Based on the similarity between the reading test and the B1 Cambridge Reading Paper, the test was considered valid in terms of criterion-relatedness.

The reliability of the test was ensured by administering it to a group of 15 Polish learners of English at a B1-level course for seniors, none of whom participated in the eye-tracking later. The testees' total scores were listed in descending order, forming three groups of five. The reading test was calculated in terms of the number of correct answers in each group of five participants. The number of correct answers from the top 5-participant group was added to the number of correct answers from the bottom 5-participant group to estimate item difficulty. Each item in the reading test had its difficulty score calculated by dividing the sum by 10. Cronbach's alpha score of .84 for the 5-question reading test indicated an acceptable level of reliability.

Eye-tracking Procedure

The eye-tracking stage of the data collection procedure included recording the oculomotor behavior of the participants instructed to do five similar comprehension tasks for four-paragraph texts in L1 (Polish) and then in L2 (English). The texts were presented on the left and the questions on the right side of a 15.6"-monitor with a resolution of 1366 x 768 pixels. An eye-tracker Tobii Model X120 (Tobii Technology, Stockholm, Sweden) was positioned below the monitor. The eye movements of participants sitting about 60 cm from the screen were measured at a sampling frequency of 120.

Six AoIs were programmed to collect such eye-tracking measures as dwell time and total and mean fixation duration for each text with tasks. The AoIs covered the body of the text and the instructions for each of the five tasks separately. The eye-tracking data for each AoI in the text in English is shown in Appendix B.

There was no time limit to avoid increasing the participants' anxiety levels and enable them to complete all the tasks as we had expected some participants would need more time to do the test. The participants provided their answers on separate sheets of paper to avoid any change in the content of the screen. After the reading session, the participants were asked to answer questions about the difficulty of each (L1 and L2) text and decide which of the tasks they considered most difficult.

Post-task Questionnaire

Immediately after the reading session, a post-task questionnaire was administered in Polish. It asked the participants to assess the difficulty of the text and the tasks in L1 and L2 on a scale from easy to very difficult. The options to choose from were as follows: very difficult, difficult, neither difficult nor easy, rather easy, easy. The respondents were also asked to report which task (or tasks) in L1 and L2 were the most challenging for them.

Data Collection Procedures and Analyses

The difficulty of reading tasks was measured in three ways. The first one was the perceived difficulty of texts and tasks in L1 and L2, investigated on the basis of the participants' answers to questions in a post-task questionnaire about how difficult the texts and tasks in each language were for a particular respondent. In addition, the participants were asked which task in L1 and which task in L2 was the most difficult for them. The second way of measuring the task difficulty was the correctness of the participants' answers to the tasks in L1 and L2 recorded in the answer sheets was examined. The degree of discrepancy between the perceived difficulty of the texts and tasks and the actual score of each contributor was measured. The third way in which the task difficulty was assessed was the analysis of the eye-tracked data recorded while each participant was doing the reading comprehension tasks to the texts in L1 and L2. The focus was on the AoIs attributed to each task in order to illustrate the overall cognitive load on doing each type of task. What was measured was the gaze duration (the sum of all fixations recorded for a given AoI), the fixation count, and the mean fixation duration on the main text. The three ways of measuring task difficulty allowed for balancing the strengths and weaknesses of each of them, generating a richer and wider-reaching set of data and allowing for triangulation of the findings of each way.

The assumption was that the longer the participant spent on a task, the more difficult it was to do. Tasks perceived as difficult but manageable, no matter their actual complexity, should motivate test-takers to read more carefully, which is a characteristic exhibited by longer total and mean fixation durations and a higher number of fixations, indicating that the task constitutes a major cognitive challenge. Complex tasks perceived as easy might trigger just the opposite oculomotor behavior of the readers, which would result in more incorrect answers due to the false impression of simplicity, leading to less careful consideration of the task instructions and the text fragments necessary to answer the questions. Eye movement patterns characteristic of less careful reading applied in solving tasks perceived as easy, lead to errors caused by haste and lack of attention to potential tricks in complex tasks or even in simple tasks.

Findings

The first research question was about the existence of a discrepancy between the perceived and measured difficulty of the texts and all tasks in L1 and L2. The general analysis of the data as presented in Figure 1 (perceived general text and task difficulty in L1 and L2), Figure 2 (comprehension test scores for each task in L1 and L2) and Table 1 (mean dwell time and fixation values for each text and task in L1 and L2) allowed us to answer the research question.

A more detailed analysis of the data in Figure 2 in the light of Figure 1 and Table 1 enabled us also to find the answer to the second research question about the impact of L2 intermediate students' perception of texts and tasks in L1 and L2 on their performance in reading tests in both languages.

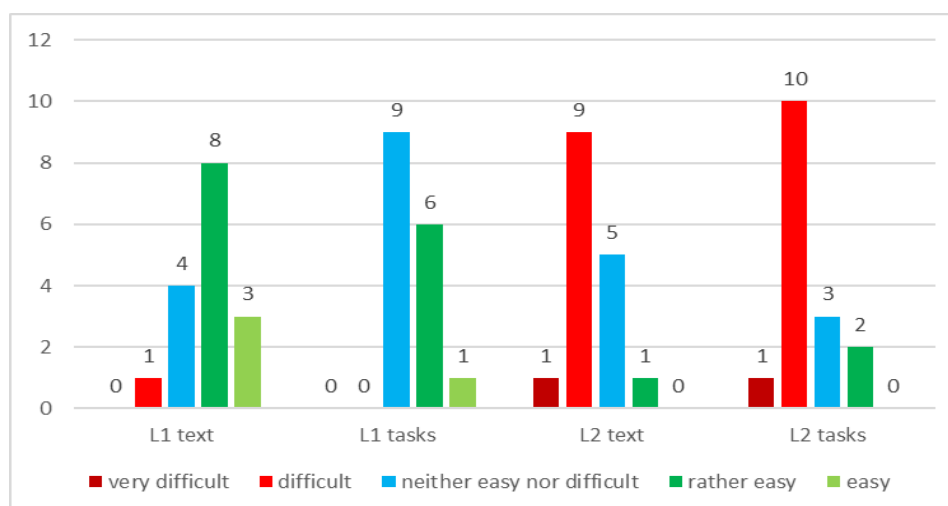


Figure 1. The perceived difficulty level of text and tasks in Polish (L1) and English (L2)

As far as the perception of text difficulty is concerned, as expected, the text in L1 is regarded by the participants as easy and rather easy, and the text in L2 — as difficult and rather difficult. Possibly, this is due to the partakers' confidence in the general language proficiency level in the lexico-grammatical sense in L1 and L2, which allows the readers to grasp the gist of the text upon first reading in L1 and relatively less frequently in L2 at the B1 level. In the case of L2, a respondent's perceptions of text and task difficulty seem to overlap, suggesting that the perceived difficulty of both text and tasks might be linked to lexico-grammatical knowledge necessary to decipher the meaning of words and sentences in the texts and task instructions and questions (Figure 1).

Tasks are seen as slightly more challenging than the text itself in L1, as the tendency shifts from rather easy to neither easy nor difficult, which is not the case in L2, where both text and tasks appear as difficult to the participants. It might imply that the participants seemed unable to assess the difficulty of the tasks in L1, which could be due to their lack of educational experience with written pen-and-paper comprehension tasks in L1. When the participants' cohort was at school, there were no other comprehension tasks than oral summarizing or interpreting a text, and therefore, they might find it challenging to rank a written comprehension task's level of difficulty or complexity (Figure 1).

The participants' overall reading test results are compatible with their initial assessment of the text and task difficulty in a particular language (Figure 2). The reading test score in the group — with a maximum score of 8 points for each language — for L1 ($M = 5.8$; mode = 7; $SD = 2.04$) and for L2 ($M = 3.93$; mode = 3.5; $SD = 1.92$) shows an expected better overall performance in the reading test in L1. There were four participants (two with generally high scores on the reading comprehension tests in L1 and L2 in this study and two with generally low scores on the tests) who performed slightly worse in tasks in L1 than in L2, even though they spent significantly more time on the tasks in L1. This might display certain reading difficulties probably caused by the novelty of the testing situation. However, the novelty seemed to quickly wear off for the text and task in L2, with whose format the students were familiarized during their L2 education, and the reading on-screen did not distract their attention so much as during the task in L1.

Apart from any information appearing in Figure 2, we note the following: the average total amount of time spent on reading the text and doing the tasks is 15 min 50 sec for the text in

L1 and 10 min and 49 sec for the text in L2, which might suggest the relatively higher difficulty of the former. The participants may have taken significantly less time to complete the tasks in L2 due to fatigue after completing the task in L1 first and trying to make up for lost time on the first part or to level up their performance. Nevertheless, such a situation might suggest that the text and tasks in L1 appeared to be relatively difficult for the majority of the participants (14), some of whom performed better on these tasks (7) and some slightly worse (4) than in L2. Only four participants showed a reverse pattern — spending more time on the text and tasks in L2, and one participant was a quick reader in both languages. The time spent interacting with a text did not influence the participants' performance.

Turning now primarily to research question 2 and to Table 1: contrary to the average duration of the participants' interaction with the texts in both languages, the eye-tracking data such as the mean of the number of fixations (L1 = 435 and L2 = 518), the mean of the total fixation duration (L1 = 2:11 and L2 = 3:15) and the mean of the average fixation duration (L1 = 263.3 and L2 = 296.3) proved that the participants' average interaction with the text in L2 was slightly more laborious than in L1. It suggests a shift from a less attentive reading to lots of brief revisions in L1 to a more elaborate focus on the content of the texts in order to decipher its meaning in L2. As Rayner et al. (2006) claim, when text is difficult, the processing time increases (specifically the number of fixations), and skilled L1 readers typically fixate for 200–250 milliseconds. According to Dolgunsoz and Sariçoban (2016), L2 learners at B1 and B2 levels fixate on text for 538 ms and 426 ms, respectively.

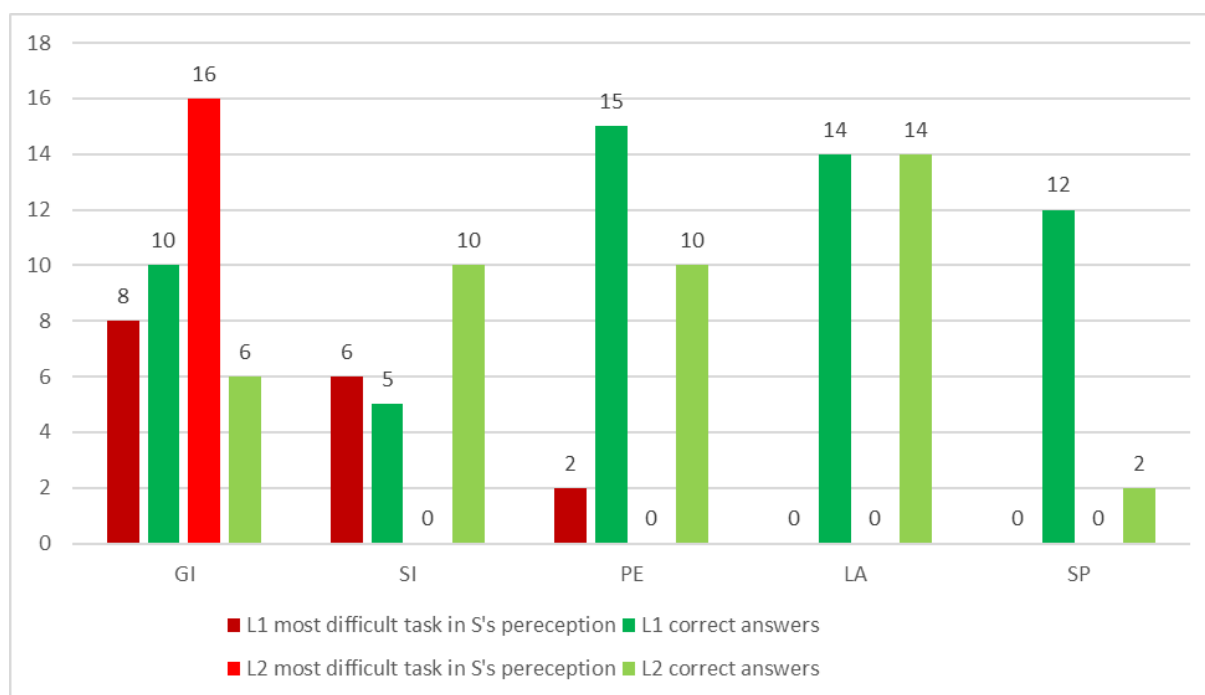


Figure 2. The most difficult task in participants' perception in Polish (L1) and English (L2) and the accuracy of answers in all question formats tested — paragraph matching for general inferencing (GI), gap-filling for lexical access (LA), multiple choice for specific inferencing (SI), true-false for propositional encoding (PE), and short question answer for syntactic parsing (SP)

Returning to Figure 2, in the readers' perceptions, one of the tasks is the most difficult in L1 and L2. It was a task requiring the students to use general inferencing skills to read the text for general information and match its paragraphs and the titles listed in the task. Because it was the first task, it turned out to have dominated the whole testing session and took most of the

readers' time. In L2, all participants pointed at this task as the most difficult, which might have been influenced by their lower proficiency in the language required to process larger chunks of text. In L1, the distribution was more diversified, and the answers were distributed between the two kinds of inferencing questions: general and specific inferencing. The learners noticed in L1 the difficulty of processing specific inferencing and syntactic parsing tasks that required more attention devoted to smaller sections of text.

As assumed, in L1 and L2, a certain consistency can be observed in lexical access tasks that appear and turn out easy for the participants. In L2, specific inferencing and propositional encoding tasks were done correctly by most participants, who did not pinpoint them as difficult. And most learners made mistakes in the general inferencing task in L2, which all considered the most difficult. Even though students responded more attentively to the difficult task, their processing overload was exacerbated by the length of the text and the number of lexico-grammatical items unknown to the reader. In the general inferencing task in L1, the perception of the task as difficult made the students pay more attention to it and lengthen the time, increasing the number of rereading attempts that resulted in a relatively high number of participants who did the task correctly, possibly due to easier lexical access and syntactic parsing done on the way to general inferencing. In the specific inferencing task in L1, some participants perceived it as difficult, but the majority made mistakes, not paying enough attention to the shorter text fragment to be processed. In L2, this task came out relatively well, and none of the participants considered this task to be difficult. It might suggest that the very type of task does not entail its perception as difficult or easy or the accuracy of performance, both of which might be related to the perceived comprehension of the text fragment required to do the task at the lexico-grammatical level.

As shown in dwell time, fixation count, and total fixation duration, the syntactic parsing task seen as easy in L2 yielded low accuracy, which might be because the participants did not re-read or double-check their answers (Table 1).

Table 1. Mean dwell time and fixation values for the texts and tasks

Areas of Interest (AoIs)	Dwell time on each AoI [%]		Total fixation count [N]		Total fixation duration [ms]	
	L1	L2	L1	L2	L1	L2
TEXT	34	43.1	426	536	347	396
Paragraph matching for general inferencing (GI)	16	10.4	81	116	281	334
Multiple choice for specific inferencing (SI)	5.2	13	60	62	250	384
True-false for propositional encoding (PE)	3.8	9.9	47	34	268	341
Short question answer for syntactic parsing (SP)	1	1.2	12	16	269	317
Gap filling for lexical access (LA)	2.9	3.2	36	38	279	493

Table 1 shows the eye-tracked data related to the selected AoIs corresponding to the body of the text and the instructions for each of the five tasks. The gaze duration and fixation count on the selected AoIs depict the attention the texts in L1, and L2 received from the participants and the focus on each task in each language. The data reveal that learners tend to spend more time with the text in L2, and this text receives more fixations, which confirms the assumption that reading in L2 constitutes a more laborious process for the learners than reading in L1. In all tasks, except for the general inferencing, the participants tended to spend more time reading the instructions in L2 than in L1; however, the fixation counts and durations are comparable for both languages, which indicates more fluent but, at the same time, careful reading of the less complicated instructions in both languages.

When it comes to the instructions for the general inferencing task — reported as the most difficult in both languages by the majority of participants — in L1, it recorded the longest cumulative gaze time amounting to three times more than for the other tasks and the largest fixation count; however, the discrepancy between the fixation counts and durations for this task and the other ones was not so high. For L2, the gaze duration in the first three tasks — GI, SI, and PE — was comparable to each other, and there was a discrepancy between the fixation count on the GI and the other two comparable tasks. This data suggests that in L1, the general inferencing (GI) task was re-visited and re-read several times with less labor. In L2, it tended to be read more laboriously but with fewer revisits. It implies that decoding the options in L2 was more difficult than holding them in memory, whereas, in L1, it seemed just the reverse. The explanation for that, except that the options in L1 were longer and syntactically more complex than in L2, might be the novelty of the task format (multiple-title matching) in L1, which was repeated in L2 after the participants were exposed to it in L1 first (Table 1).

In the specific inferencing multiple-choice task, which appeared the most difficult in L1 to several research participants, the dwell time and fixation count in L1 do not show the difficulty. It implies that the problem lies more at the level of finding the correct answer in the body of the text and selecting the right option rather than lying at the level of the stem and the options of the multiple-choice task. The answers showed that most participants were misled by the distractors in the question in L1, whereas, in L2, most participants selected the right option among the ones that were more straightforwardly formulated in relation to the relevant information in the text (Table 1).

A similar situation can be noticed in propositional encoding in true/false questions in L2, where the participants spent more time reading the instruction with a low number of fixation times, which suggests revisiting the instruction and re-reading it quickly to find the answer in the text (Table 1). Quite a few participants chose the wrong answer, being misled by the lexical difference between the wording of the concept found in the instruction and in the text. The least complicated lexical access one-sentence gap-filling questions seemed to take the participants the least time and effort to read and were answered relatively correctly by the participants both in L1 and L2, which was not surprising to prove to be the simplest question type, as in the scale by Khalifa and Weir (2009).

The syntactic parsing task in the form of a question to provide a short answer appeared to receive the least attention in both L1 and L2, as it was read quickly and fluently, and the answers were provided without revisiting the question often in both languages. It was probably so because the question was the last one, and the participants were already tired of doing the previous tasks, and the question form led them to the answer being a number. However, in L2, there were two numbers to choose from, and most readers chose the wrong one, disregarding the syntactic relations between the numbers (Table 1).

The lexical access gap-filling task surprisingly turned out not to be the easiest one, as it took more dwell time and number of fixations than the syntactic parsing task (Table 1). In L2, the fixation duration was significantly higher than in the other tasks. The answers were not always correct, as the participants tended to provide more information than needed, e.g., full name instead of the family name required. Participants' difficulty may be related to the task format, which requires them to write their answers instead of just marking them.

Discussion

The two research questions in the present study focused on discrepancies between perceived and measured difficulty of texts and tasks in L1 and L2 (RQ1) and the impact of such discrepancy on intermediate students' performance in reading tests (RQ2). We discuss these in turn.

RQ1: Perceived and Measured Difficulty of Texts and Tasks in L1 and L2

Among students at an A2–B1 level in L2, tasks and texts tend to be perceived as more difficult in L2 than in L1, despite their objective complexity measured through readability formulas being comparable — adopting Greenfield's (2004) position that the readability formulas are generally valid for EFL. This perception is based on the assumption that there will always be some lack on the level of lexis, grammar, discourse structure, etc. in L2, which will lead to the perceived difficulty in understanding texts, at least for intermediate students. The eye-tracking measure showed a more laborious reading of the texts in L2 with a significantly larger average number of fixations (by $\frac{1}{5}$) and a slightly longer average fixation time per reader in comparison to the texts in L1 (Table 1), which corroborates the results of the study into comparing L1 and L2 reading for studying by Dirix et al. (2020).

The surprising result in our study was the tendency among the participants to spend more time on the text and tasks in L1 than in L2, which runs counter to the statement that in the student-reader perception of text and task, the difficulty lies in the amount of time spent on doing the task and the lexical-grammatical complexity of both the body of the text and the task instructions, irrespective of the text language (L1 or L2). However, the readers might have shown a strategic reaction to the performance situation resulting from fatigue due to longer than expected activity of reading in L1 in a novel situation with tasks accompanying text first. They seemed to attempt to make up for lost time on the first part or level the whole performance time during the task in L2. The strategy suggests either a change from less attentive reading and lots of quick revisions in L1 to a more detailed focus on the content of the text to decipher its meaning in L2. Nevertheless, despite their focus on the task perceived as difficult, students may not have been able to handle the processing overload resulting from the length of the text with unknown lexico-grammatical elements in L2, which led to poorer performance.

In the case of tasks, in general, they also tend to be perceived and measured as more difficult in L2 than in L1, with students scoring on average higher in reading tests in L1 than in L2. The fixation duration for the task instructions in L2 is slightly longer than in L1 and is comparable with the fixation duration on the text. In contrast, in L1, the fixations appear slightly shorter, which suggests that the instructions themselves do not require a lot of the reader's attention, with the main focus being on the text.

These results imply that texts with similar complexity in L1 and L2 are not only perceived but also measured as more difficult in L2 for intermediate readers with lower performance scores and a more laborious reading process than for L1. As shown by Dolgunsöz and Sariçoban (2016), the eye movements alter with the development of reading skills from B1 to B2 levels with the drop of total fixation and first and second pass time and rate. This suggests that the study should be replicated with more advanced students to determine whether the measured and perceived difficulty of texts in L1 and L2 further changes across proficiency levels in L2.

RQ2: Impact of L2 Intermediate Students' Perception of Texts and Tasks in L1 and L2 on their Performance in L1 and L2 Reading Tests

The present study does not show any general, consistent tendency for intermediate L2 students' scores in reading tests in L1 (generally perceived as easier and read less carefully) than in their L2 (considered more difficult and read more attentively) as being either significantly higher or lower for any of the languages, which might suggest that the attention with which students read does not need to reflect their general accuracy in the test. Some tendencies, however, can be seen at the level of individual task items representing specific task types.

In the case of individual task-type difficulty, the scale introduced by Khalifa and Weir (2009) was generally confirmed in the present study for both L1 and L2 in student perception. The measured outcomes brought the expected results for the inferencing tasks requiring higher-order processing to turn out to be the most difficult for the participants. At the bottom of the scale, the ranking of the task difficulty depended more on the task format, the decision of what information to provide as an answer and not being misled by the seemingly easy options. It was the case of the easiest task in the scale — gap-filling for lexical access, which turned out more difficult than a short question answer for syntactic parsing. Although the participants did not consider the tasks difficult, they made mistakes in both cases.

In the lexical access task, the participants paid more attention to the task instruction, which appeared surprisingly easy at first glance in L2. In syntactic parsing, the students disregarded the one that required them to look for a particular category of items in the text, not paying enough attention to notice that there were two potential answers to choose from if the syntax was not properly deciphered. The factors responsible for the apparent difficulty — manifesting itself in inaccurate answers to the task requiring the students-readers to apply the low-level ability of syntactic parsing in L2 — are not only the insufficient lexical-grammatical knowledge but also overgeneralized use of the well-trained strategy applied while scanning a text without the strategy of double-checking the answers, widely applied in the general inferencing task placed higher on the scale of difficulty. Therefore, the strategy of double-checking answers to apparently easy tasks should be encouraged in both L1 and L2 reading instruction. Developing test-taking strategies for detecting trickery in appearing over-easy tasks requiring readers to slow down and reread them may be another suggestion for classroom practice of teaching reading in any language.

The implications of the study for test design in reading comprehension in L1 and L2 show that reading task difficulty should comply with the scale of reading ability and ought to be introduced in this order to student-readers depending on their level of proficiency. Specific reading skills and familiarity with particular lexical-grammatical items considered necessary by the designers of reading tests at a certain language proficiency level may not be regarded as significant abilities by experienced adult readers taking such tests. This mismatch might

result in the discrepancy between the test takers' concentration on specific task types regarded by them as either under or over their current competence level and the level of accuracy of their performance in particular standardized assessment reading comprehension tasks.

Conclusions and Implications

The present study into the perceived and measured difficulty of texts and tasks in L1 and L2 conducted with experienced adult readers in L1 at an intermediate level of proficiency in L2 gave an insight into the differences between the perceived and measured difficulty of texts and tasks in L1 and L2 and how the students' perception of the difficulty affects the students' task performance.

According to the study, L2 learners perceived L2 texts and tasks as more challenging than L1 texts and tasks of similar complexity. L2 texts and tasks are also measured as requiring a heavier cognitive load, manifesting in more careful reading with longer mean total fixation durations and a higher number of fixations. Besides, the general results in reading comprehension tests tend to show better performance in tests in L1 than in L2. Thus, for experienced readers in L1 who are at an intermediate level in L2, L2 texts accompanied with tasks prove to pose more difficulty than tasks in L1, showing that at this level, the lexicogrammatical and discourse complexity and then the fear of not being able to decipher the meaning of words make reading in L2 appear more difficult. Therefore, it is advisable to conduct similar studies with more advanced learners to investigate whether the perception of difficulty evolves with the level of proficiency in L2.

Another finding is that the sheer time spent on doing tasks accompanying the text cannot be treated as the measure of difficulty as it might result from several factors, including the situational novelty of the necessity to do tasks to a text in L1, test-taking strategies to improve the average performance in L1 and L2 or fatigue with the previous task leading to shortening the time of doing the following one. Thus, in future studies, the test performance with and without a time limit may be considered to measure the students' performance and strategies used in L1 and L2 reading. Another suggestion might be counterbalancing the order of test-taking among the participants, asking some of them to do the L1 and some to do the L2 tasks first.

Finally, in individual reading tasks, the complexity scale proposed by Khalifa and Weir (2009) works in L1 and L2. In the easiest tasks in the scale, reading test designers should pay attention to the task format, as test takers tend to associate a specific kind of task with certain task formats. If the test designers change the usual pattern, it might mislead students in their answers. The issue of the consistency of the task type and task format patterns can be taken into consideration while gauging difficulty in reading test design and subsequently in test-taking training.

Future Research

Firstly, the most significant limitation of our study on the perceived and measured difficulty of texts and tasks in L1 and L2 is the small sample size ($n = 16$), which results in making just tentative inferences based on descriptive statistics. Therefore, the study requires replication with much larger sample sizes in order to conduct robust statistical analysis and provide

(precise) parameter estimates. Secondly, similar research, including longitudinal ones, should be conducted with learners with different proficiency levels in L2, especially those of intermediate and higher levels, to detect whether and possibly how the perceptions of text and comprehension task difficulty develop with increasing lexico-grammatical knowledge and how it might influence their reading performance and processes in L1 and L2. Thirdly, future studies may focus on different comprehension task formats presented to the readers in varying numbers and order, with and without a time limit, as well as with texts of varying complexity to investigate further the factors influencing the perceived and measured difficulty of texts and tasks in L1 and L2.

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Appendix A

Stimulus Reading Tasks in L1 and L2 with Tasks Labeled

Do the tasks to the text

Text

Slow food

[Title 1. _____]

Members of Slow Food meet regularly to enjoy long slow sociable meals. But Slow Food isn't just about enjoying good food. It's about improving the quality of our lives. It believes a slower pace of life is healthier and better for us and that fast food and fast life is destroying an important part of our culture.

[Title 2. _____]

"Each culture has its own language, music, art, it also has its food culture", says Carlo Petrini, the founder of Slow Food. Psychologists agree. They tell us it's important for people to enjoy a good meal around a table, and that it's especially important in families.

[Title 3. _____]

The Slow Food movement wants to make sure we don't lose our food culture and our regional cooking. Slow Food also works with teachers in schools to teach children about food and how to enjoy it.

[Title 4. _____]

The number of fast food outlets continues to grow, but 6,000 of Slow Food's 66,000 members are in America, the home of fast food. Perhaps things are changing.

Tasks

1. Put **A, B, C** and **D** next to the correct number in the text. They are mixed titles of the paragraphs.

A – Slow Food and the Future

B – What is Slow Food **General inferencing [GI]**

C – Slow Food Paradox

D – What People Say about Slow Food

2. Fill in the gap.

Lexical access [LA]

The founder of Slow Food's family name is _____.

3. Circle the correct answer.

Slow Food:

Specific inferencing [SI]

A – is only for rich people

B – is about making life better

C – doesn't work with children

4. Is this sentence **TRUE (T)** or **FALSE (F)**? Write your answer **T** or **F**.

Proposition encoding [PE]

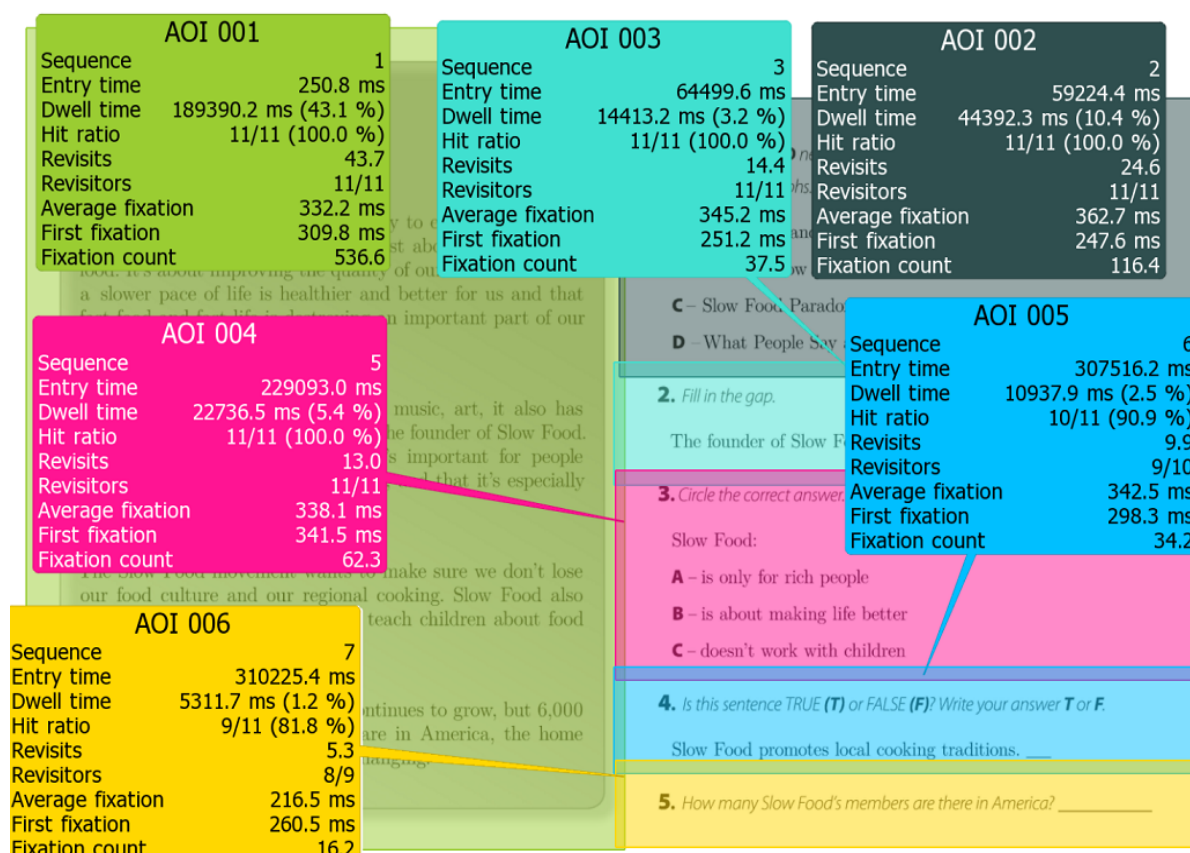
Slow Food promotes local cooking traditions. ____

Syntactic parsing [SP]

5. How many Slow Food's members are there in America? _____

Appendix B

Eye-tracking Data on the English Text and Tasks



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