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Exploring the role of language knowledge and background knowledge in reading comprehension of specific-purpose tests in higher education

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Abstract

Though the empirical findings of the past studies in the literature have offered strong support to the significant role of language knowledge and background knowledge in reading comprehension, this issue has not been explored with regard to specific purposes tests in the Iranian higher education context. Therefore, this study aimed at exploring the interaction effects between language knowledge and background knowledge among Iranian university students majoring in economics. For this purpose, a total of 90 students including male students ($n = 35$) and female students ($n = 55$) majoring in economics were selected through a convenience sampling method. Having been divided into three proficiency levels, they took three high-stakes reading tests constructed by the National Organization of Educational Testing in Iran for Economics candidates. Based on three criteria, including sentences with passive, Flesch Readability Index, and sentences with participles as attributes, the three texts were ranked in order of easy to difficult (text 1, text 2, and text 3). Afterward, 15 participants participated in semi-structured interviews to express their experiences with the reading tests. The results indicated that background knowledge had marked effects on the performances of the participants across the three reading texts. However, in the more specific reading text (text 3), neither general language knowledge nor general background knowledge were strong indicators. Additionally, the results of the semi-structured interviews with the participants revealed they lacked the required language and content knowledge to perform well on the reading text 3. In light of the findings, a range of implications is proposed for pertinent stakeholders.

Keywords: Language knowledge, Background Knowledge, Reading Comprehension, Specific-purpose tests, Higher Education

Introduction

It is deemed that reading comprehension plays a crucial role in academic progress because learning in all subjects is entangled in it. As noted by Snow (2002), students read all kinds of text to construct and extract meaning in it. The 40-year literature on reading comprehension yielded this strong conclusion that background knowledge is of

paramount significance to reach a correct comprehension of all kinds of text (Garner & Gillingham, 1991; Recht & Leslie, 1988; Smith et al., 2022; Vadivel et al., 2021; Walker, 1987). One of the first models suggested to explain reading comprehension is the Simple View of Reading (Gough & Tunmer, 1986; Rahman et al., 2021). It posits that readers need to use distinct yet related skills, namely decoding and language comprehension to reach correct comprehension. In simple terms, decoding is “the ability to recognize individual written words” (Smith et al., 2022, p. 215). And, language comprehension is concerned with the processes of extracting meaning from words and connected discourse. Readers have to use both skills simultaneously during the reading processes (Castles et al., 2018; Liu et al., 2021). Once students achieve accuracy and fluency with coding, they need language comprehension. This issue is crucial in language testing for specific purposes.

Language testing for specific purposes has received remarkable attention in recent years (Cai & Kunnan, 2019; Davidson, 2022). Drawing on the work of Widdowson (1979), Bachman and Palmer (1996), Bachman et al. (1991), and Davidson and Lynch (1993), Douglas (2000) defines a specific language test as follows:

one in which test content and methods are derived from an analysis of a specific purpose target language use situation, so that test tasks and content are authentically representative of tasks in the target situation, allowing for an interaction between the test taker's language ability and specific purpose content knowledge, on the one hand, and the test tasks on the other. Such a test allows us to make inferences about a test taker's capacity to use language in the specific domain (p. 19).

This definition brings to attention the importance of some key concepts in language testing: target language situation or context and interaction of test-takers' language knowledge and background knowledge. Background knowledge is defined as “the interaction between one's prior knowledge and the content of a specific passage” (Alexander et al., 1991, p. 334). Despite this, there is not any consensus over the importance of the interaction between the background knowledge and language knowledge in language testing for specific purposes. A lion share of this issue is due to the lack of required empirical findings to shed light on its different perspectives. A cursory glance at the literature reveals that the role of language knowledge and background knowledge in reading comprehension of specific-purpose tests in higher education in the Iranian EFL context has received scant attention. In response to this long-lasting gap, the present study aimed to investigate the role of language knowledge and background knowledge in reading comprehension of specific-purpose tests in higher education (Rezai et al., 2022; Vadivel, 2021). It is hoped the results of the present study can further the pertinent stakeholders' understanding of the role of language knowledge and background knowledge in reading comprehension of specific-purpose tests, and accordingly, help them improve the instruction in English classes for specific purposes.

Theoretical underpinnings: two opposing perspectives

Unlike Davies (2001) who stresses entirely the test-takers' purely linguistic background in specific purpose communication, Jacoby and McNamara (1999) and Douglas (2013) posit that performance on languages for specific purposes (LSP) is affected not only

by language knowledge of test-takers but also by their content knowledge relevant to the communicative context within which the test-taker needs to operate. According to Jacoby and McNamara (1999), relying solely on general linguistic criteria to one's ability to perform in LSP tests will not undoubtedly allow language testers to capture real-world communicative capabilities of the test-takers given the fact that "special-purpose performance is by definition task-related, context related, specific, and local" (p.234). Also, Elder et al. (2007) note that "if language proficiency were all that mattered, then native speakers would be automatically assured of an easy passage through their academic courses" (p. 53). In the same vein, Douglas (2013) stresses that "it should always be a part of the construct of specific purpose tests that learners' specific purpose language needs include not only linguistic knowledge but also background knowledge relevant to the communicative context in which learners need to operate" (p. 371).

Given the importance of context and language use situation, which according to Chapelle (1998) governs the language choice, language knowledge should receive different interpretations from one situation of use to another. Douglas (2000) opines that background knowledge associated with those situations must be part of the construct under investigation. However, Ruth and Murphy's (1988) point is relevant here where they argue that 'no topic can absolutely guarantee equal access to knowledge of the subject matter for all participants in a test. But some topics provide more opportunities than others' (p. 253). In a recent article entitled "ESP and Pedagogy", Douglas (2013) suggests that English for specific purposes (ESP) tests (which cover English for academic purposes (EAP) tests as well) be based on our understanding of three qualities of specific purpose language. First, he points out that language use varies as the context of use varies. Second, specific purpose language is precise, that is, in their communication practitioners in every field attempt to be more precise and accurate. And finally, he believes that there is an interaction between specific purpose language and specific purpose background knowledge. Therefore, motivated by these three qualities of EAP tests, the present study aims at investigating the interaction between specific purpose language and specific purpose background knowledge in an EAP reading test among Iranian EAP economics students.

A plethora of research on listening comprehension (Alderson, 1988; Chen & Graves, 1995; Ridgway, 1997), speaking (Jensen & Hansen, 1995), writing (Douglas & Selinker, 1993; Papajohn, 1999; He & Shi, 2012), and lexical inferencing (Read, 1990; Tedick, 1990; Pulido, 2007) has demonstrated that background knowledge or prior familiarity (topical knowledge in Bachman & Palmer, 1996) with the content of a test in LSP influences comprehension of a given text to a great extent. When a certain level of L2 proficiency has been reached, L2 reading is influenced positively by background knowledge (Cai & Kunnan, 2019; Ghahderijani et al., 2021; Vadivel & Beena, 2019). Related to this is Clarke's (1980) notion of "short circuit hypothesis" which predicts that the first language (L1) reading strategies cannot be transferred to enhance comprehension abilities of the second language (L2) readers until they reach a certain level of L2 proficiency. In other words, L2 learners need certain levels of L2 proficiency or linguistic thresholds or in order to enable them to transfer their L1 reading strategies into L2 reading contexts. There is a number of studies which have demonstrated that as the learner's proficiency level in the L2 proficiency increases, the learner's chances of transferring their L1

reading strategies to L2 reading increases (e.g., Bernhardt & Kamil, 1995; Kolganov et al., 2022; Yamashita, 2004; Pichette et al., 2003).

Contrary to the “short circuit hypothesis,” it is argued that learners vary in their reliance on background knowledge. In other words, those learners with high levels of language proficiency might not rely on their background knowledge as much as those learners with medium and low levels of language proficiency. In cases where advanced learners lack the requisite background knowledge, they are more likely to fall back on their language proficiency compared to learners with lower and medium levels of proficiency. All this has led some researchers to believe that there are two threshold levels of the background knowledge. Clapham (2000) explanation is relevant:

while lower level students could not take advantage of their background knowledge because they were too concerned with bottom-up skills such as decoding the text, and while high proficiency students were able to make maximum use of their linguistic skills so that, like native speakers, they did not have to rely so heavily on their background knowledge, the scores of medium proficiency students were affected by their background knowledge (pp. 215-216).

Below, we review prior research which has investigated the interaction between specific purpose language and specific purpose background knowledge in light of hypotheses discussed above.

Review of the related studies

In the literature, a range of studies have been conducted to explore the effects of language knowledge and background knowledge in reading comprehension of specific-purpose tests. (Abdollahi et al., 2022; Clapham, 1993, 1996, Clapham, 2000; Darabi Bazvand, 2019; Krekeler, 2006; Ridgeway, 1997). For example, dividing 69 students into low and high proficiency levels, Ridgeway (1997) explored the points where linguistic threshold emerge. The findings evidenced that the background knowledge had significant effects on the comprehension of the participants with different language proficiency levels. Further, Clapham (2000) explored the effects of background knowledge on reading comprehension of EAP. The results documented that the students did not necessarily do better if they were given passages in their own academic subject areas. Furthermore, Krekeler (2006) examined the role of background knowledge in language for specific academic purposes among international students in Germany. The findings revealed that the participants' background knowledge significantly affected their reading comprehension achievement. Additionally, the results disclosed that while the effects of the participants' background knowledge were different in regards to their proficiency levels, concerning the possible thresholds, the results were inconclusive. Besides, Schmitt et al. (2011) investigated the correlation between percentage of vocabulary known in a text and level of comprehension of the same text. They invited 661 participants from eight countries to respond a vocabulary measure based on words drawn from 2 texts, read the texts, and then completed a reading comprehension test for each text. They found that there existed a linear correlation between the percentage of vocabulary known and the degree of reading comprehension. Likewise, the results disclosed where comprehension dramatically increased, there was not any indication of a vocabulary “threshold.” Finally,

Smith et al. (2021) critically reviewed the previous studies on the effects of background knowledge on primary school children's reading comprehension. They found that higher levels of background knowledge affect differentially students' reading comprehension. Further, the findings indicated that stronger and weaker readers were differentially affected by background knowledge. Plus, they disclosed that the readers with lower background knowledge benefited more from the passages with high cohesion while the while weaker readers were able to compensate somewhat for their relatively weak reading skills in the context of a high degree of background knowledge.

As may be inferred from the above-reviewed studies, the levels of language proficiency might differentially trigger different levels of background knowledge use in the processes of reading an EAP text. However, to what extent and whereabouts the interaction between the language knowledge and background knowledge comes into play still remains a contentious area of research. There is almost a consensus that intermediate level students could take advantage of their background knowledge. However, little (if any) research is conducted to investigate the interaction between language knowledge and background knowledge in reading texts of varying difficulties. Therefore, compared to previous research, the present study is innovative in that it employed three subject-knowledge tests ranging from less specific to more specific tests based on the difficulty criteria discussed below. Where and at which level of language proficiency or linguistic thresholds learners are able to draw on their background knowledge when reading texts of varying specificities remains unknown. Therefore, this gap provides enough impetus for the current study to address the following research questions:

RQ1. To what extent the reading comprehension of the specific-purpose tests of EAP students of economics is influenced by language knowledge and background knowledge?

RQ2. At which proficiency levels or linguistic thresholds does background knowledge emerge to impact on the readers' comprehension of the specific-purpose reading tests?

Method of the study

Design of the study

The researchers adopted a sequential explanatory mixed-methods design to reach the objectives of this study. That is, the quantitative data were supplemented by qualitative data to reach triangulation. Triangulation offers the opportunity for the researchers to look into a topic from different perspectives by gathering different types of data (Mackey & Gass, 2015). Overall, the researchers employed the mixed-methods design to disclose the role of language knowledge and background knowledge in university students' reading comprehension of specific-purpose tests in Iran.

Participants

The present study was conducted in the setting of University of Ayatollah Ozma Borujerdi, Iran. It is a state-run university directly supervised by the Ministry of Science, Technology, and Research where students are not obliged to pay for any tuition. A total

of 90 students majoring in economics were selected through a convenience sampling method. They included male students ($n = 35$) and female students ($n = 55$) and aged from 20 to 34. They were junior students ($n = 40$) and senior students ($n = 50$) and had passed the general English course (3 credits) before taking the course namely English for students of economics (ESE). Of particular note is that the ESE course had 2 credits and was taught by university professors specialized in economics and teaching English. The participants were learning English as a foreign language and they did not have any opportunity to learn it outside of the university. It should be noted that the researchers invited the students to sign in a written consent form (in Persian) to ensure that they were willing to participate in this study. They also ensured that the university students' performances would be kept confidential and they would be informed about the final results.

Instruments

The researchers employed a master of art (M.A.) English test, constructed by the National Organization of Educational Testing in Iran for Economics students. The test was a high-stakes test used to measure the candidates' content and language knowledge aiming to enter the M.A. program. Of particular note is that the researchers considered Fulcher's (1999) suggestion for language for special academic purposes (LSAP) tests to focus on construct validity rather than content validity. To this aim, they initially validated the test drawing on Brown's (2005) procedures for differential-groups. They invited a group of 90 English Literature students and a group of 90 economics students to take the M.A. test.

As shown in Table 1, the economics students gained a mean score (9.33) which was larger than the mean score (8.12) of their English counterparts. The findings evidenced that the test contained the content related to economics. That is, the results indicated that the test had the required construct validity.

Another instrument used in this study were the general English tests. In line with the strategies suggested by Clapham (1996), the researchers used the mean (M) and standard deviation (SD) of the participants' scores on the general English tests. The participants had taken them in the previous semesters as formal final term exams. The researchers used them as the criterion for dividing the participants. The researchers were allowed to have access to the tests and the scores. The tests entailed reading comprehension passages followed by multiple-choice, short-answer, and fill-in-the-blanks items. It is interesting to note that In the Iranian higher education system, university students are required to take a two-credit Basic English course followed by a three-credit general English course. Afterward, they have to take three-credit EAP courses. Based on their means, the students who scored higher than the 'mean plus one' SD were assigned to the

Table 1 Results of independent-samples *t* test to compare for differential groups

Major Economics	English literature	Sig
<i>SD</i> = 1.46	<i>SD</i> = 1.11	0.01
<i>M</i> = 9.33	<i>M</i> = 8.12	
<i>N</i> = 90	<i>N</i> = 90	

advanced level. However, the participants who scored lower than ‘mean minus one’ SD were assigned to the elementary level. Finally, the participants who scored within ‘mean plus and minus one’ SD were allocated into intermediate group. Therefore, the participants were divided into three proficiency levels: advanced ($n = 30$), intermediate ($n = 30$), and elementary ($n = 30$).

The other instrument entailed a background knowledge test. Though the participants were studying economics over four semesters, the researchers invited two university professors in economics to design and validate a test related to the key concepts of the economics. For this purpose, they constructed a test including different items such as definitions and explanations. It included 20 items and took 90 minutes to answer it.

The other instrument consisted of a one high-stake test constructed by the National Organization of Educational Testing in Iran for Economics students (Appendix B). The test was specific-purpose and designed for candidates of economics. The test had three reading texts followed by five test items dealing with its own relevant discipline. The total number of the items was fifteen questions. They were all multiple-choice questions. The researchers adopted different methods to assess the specificity of the tests. First, they asked four subject matter specialists from the field of economics to evaluate the difficulty level of the texts and rank them from easier, moderate difficult to difficult ones. They all four worked together to reach a consensus. They finally ranked the texts in order of easy to difficult: text 1, text 2, and text 3. Second, they used Flesch Readability Index which “takes into account word length and number of words per sentence” (Alderson, 2000, p. 71). Third, the proportion of the passive sentences was another indication for specificity of the texts (Krekeler, 2006). Finally, the proportion of sentences with participles as attributes was calculated as another indicator of specificity (see Table 2). These criteria together indicated that the more specific the texts were, the more difficult they were.

The instruments used in this study are summarized in Table 3. First, they have been described in terms of aims for which they have been employed in the present study. The aim of the General English was to assess the participants’ general proficiency of English. Second, in terms of description, the general English tests consisted of twenty items. Text 1 contained an LSAP reading test involving a passage on economic activities before the Civil War of the 1860s. Text 2 as an LSAP reading test involved a reading passage on the government’s laws for paying taxes. However, text 3 was an LSAP reading passages concerning the economic activities in British North America. And, BEFORE instrument checked the participants’ familiarity with the topic with questions that were asked before the participants began to answer the reading texts. Finally, in terms of scales, the

Table 2 Reading texts: indicators of specificity

	Economics		
	Text 1	Text 2	Text 3
Sentences with passive	0%	17%	30%
Flesch Readability Index ^a	61.4	27.3	32.3
Sentences with participles as attributes	0%	17%	20%

^a Low number difficult text

Table 3 The instruments used in the study

Variable	Aim	Description	Scale
General English	Assessment of L2 proficiency	20 items (60 min)	Percentage scale
Text 1	Assessment of reading in an academic context	LSAP reading test involving a text on economic activities before the Civil War of the 1860s	Percentage scale
Text 2	Assessment of reading in an academic context	LSAP reading test involving a text on the government's laws for paying taxes	Percentage scale
Text 3	Assessment of reading in an academic context	LSAP reading test involving a text on the economic activities in British North America	Percentage scale
BEFORE	Assessment of background knowledge	Familiarity with the topic. Questions were asked before reading the texts	Dichotomous scale

General English tests and the reading passages were presented in percentage scale. However, the dichotomous scale was used to assess the participants' familiarity with the topic in the *BEFORE part*.

The last instrument adopted in this study was semi-structured interviews. To help explain how the participants felt after they took the reading tests, the researchers conducted some semi-structured interviews. In exact terms, they administered them to disclose the participants' perceptions of the discipline-specific content of the texts and their language relevant structures. To this aim, they invited fifteen willing participants, including elementary ($n = 5$), intermediate ($n = 5$), and advanced ($n = 5$) to take part in the semi-structured interviews. The researchers included an equal number of male and female students and they were given a pseudonym to remain anonymous. The interviews were run in the form of semi-structured so as to allow the researchers to look into the participants' perspectives. They were conducted in Persian to let the participants express their perceptions with ease (see [Appendix C](#) for the interview questions). They were then translated into English by two experienced translators.

Data analysis procedures

As the data were quantitative and qualitative, different approaches used to analyze them. Regarding the quantitative data, the researchers employed SPSS, version 22. First, they calculated the descriptive statistics, such as mean (M) and standard deviation (SD). Then, ran a Pearson product-moment correlation coefficients test and one-way ANOVA to answer the research questions. Regarding the qualitative data, they used an inductive content analysis approach. As noted by Riazi (2016), it is used to determine the pattern and themes in written, visual, and oral data gathered systematically. Along with the three-phase procedure suggested by Dörnyei (2007), the researchers went through three steps, namely open coding, axial coding, and selecting coding. In the open coding phase, the first researcher read the transcript to be familiar with them. Next, he created codes and named them by breaking the collected data into discrete parts. The first researcher did so in order to compare and contrast the same concepts in the data. In the second step, the first researchers tried to draw the possible connections among the codes. The reason for this was to see how he could put the same codes into similar themes. In the last step, the first researchers analyzed the former steps to see which themes and

Table 4 Results of the distribution statistics of the scores

	Text 1	Text 2	Text 3	General English
Mean score as a percentage	59.23	49.14	39.78	75.65
Standard deviation as a percentage	24.36	29.42	32.54	12.85

Table 5 Correlations between General English, text 1, text 2, and text 3: Pearson product-moment correlation coefficients ($n = 90$)

General English	General English
Text 1	0.52**
Text 2	0.41**
Text 3	0.22

** $p < .01$

patterns revolved around one core category. After that, the researchers assessed the reliability and validity of the obtained findings. They recruited two coding experts to code the data independently to measure the reliability. The results of the inter-rater reliability of their coding yielded 0.92 which was found acceptable for the purposes of the present study. Additionally, they got five participants to check if the extracted excerpts and themes represented their intended meanings. They approved that there existed a high correspondence between the extracted excerpts and themes with their intended meanings.

Results and discussion

The distribution statistics for the scores in the three reading texts, as well as the English proficiency scores (by general English) are presented in Table 4. The participants' scores on the reading tests were transformed into percentages and gathered as the reading text 1, text 2, and text 3. The mean scores in the three reading tests were significant showing that the texts were of varying difficulty for the participants and, therefore, they ranged from the more familiar to less specific ones.

Table 5 reports the correlations between the English proficiency (by general English), text 1, text 2, and text 3. As shown, the correlations between text 1 and text 2 with the English proficiency were positively significant. However, the correlation between text 3 and the English proficiency was not significant, indicating that the participants' knowledge of the general English did not influence their performances of text 3.

Based on the participants' performances on the general English test, they were classified into three proficiency groups to determine the position of possible threshold levels. Then, one-way ANOVA procedures were adopted with the variables on background knowledge (BEFORE) for the three reading tests (text 1, text 2, and text 3). Table 6 presents the ANOVA procedures with text 1 and the English proficiency (by scores on general English). The mean score of 21 participants who had prior familiarity with the topic in text 1 is 62%, and the mean score for 9 participants who did not indicate any familiarity with the topic of text 1 is 24%. As shown in Table 6, the difference between the elementary participants who had familiarity with the topic and those who did not

Table 6 Reading test (text 1) according to language proficiency (General English) and background knowledge: comparison of means

Language proficiency by General English	Background knowledge	N	Mean	Significance
Elementary level	Yes	21	62%	$F = 23.255 p < 0.01$
	No	9	24%	
Intermediate level	Yes	22	71%	$F = 26.014 p < 0.01$
	No	8	21%	
Advanced level	Yes	22	77%	$F = 27.451 p < 0.01$
	No	8	14%	

Table 7 Reading test (text 2) according to language proficiency (General English) and background knowledge: comparison of means

Language proficiency by General English	Background knowledge	n	Mean	Significance
Elementary level	Yes	17	47%	$F = 1.325; n.s.$
	No	13	22%	
Intermediate level	Yes	18	44%	$F = 9.958 p < 0.01$
	No	12	39%	
Advanced level	Yes	21	64%	$F = 12.365 p < 0.01$
	No	9	41%	

have prior knowledge about the topic is significant showing that prior topic familiarity impacted on the performances of the 21 participants. With reference to the intermediate participants, those 22 participants who benefited from background knowledge performed significantly better than those participants who did not indicate any familiarity with the topic of text 1. Likewise, the difference between the 22 advanced participants who were previously familiar with the topic of text 1 and those 8 participants who were not familiar with the topic is significant reflecting the positive effect of prior topic familiarity on the performance of the test-takers.

The one-way ANOVA procedures were applied to text 2 as well and the results are presented in Table 7. The mean score of 17 participants who had prior familiarity with the topic in text 2 was 47%, and the mean score for 13 participants who did not indicate any familiarity with the topic of text 2 was 22%. The difference between these two groups of elementary participants was not significant, showing that the background knowledge did not influence the test-takers' performances. However, with reference with the intermediate participants, it was found that the intermediate participants with prior familiarity with the topic of the text 2 and with the mean score of 44% did perform significantly better than their intermediate counterpart with the mean score of 39%.

Advanced participants who indicated familiarity with the topic of the text 2 performed significantly better than their advanced participants who did not have any familiarity with the text 2 (the mean score of 64% versus 41%). This showed that background knowledge had a significant effect on the performance of 21 students who had prior familiarity with the reading test of text 2.

Finally, Table 8 shows the participants' performances with reference to text 3. As displayed, no significant difference was found between the participants who had prior

Table 8 Reading test (text 3) according to language proficiency (General English) and background knowledge: comparison of means

Language proficiency by General English	Background knowledge (before variable)	<i>n</i>	Mean	Significance
Elementary level	Yes	11	41%	$F = 1.785; n.s.$
	No	19	64%	
Intermediate level	Yes	15	46%	$F = 21.875 p < 0.01$
	No	15	50%	
Advanced level	Yes	19	49%	$F = 23.010 p < 0.01$
	No	11	36%	

Table 9 Summary of overall reading scores

Proficiency levels	No. of participants	Text 1		Text 2		Text 3	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Elementary	30	3.77	0.61	2.17	0.89	1.92	0.88
Intermediate	30	3.91	0.48	3.46	0.78	2.59	0.74
Advanced	30	4.04	0.37	3.72	0.50	2.89	0.59

knowledge about the text 3 and those who did not in the elementary level of students. This means that no matter whether the participants had prior knowledge about the text or not, they performed equally the same on the reading text of 3. In contrast, the participants in the intermediate level who benefited from the background knowledge about the text 3 performed significantly better than their counterparts who did not have prior familiarity with the text 3. This showed that background knowledge had a significant effect on the performance of 15 students who had prior familiarity with the reading test of text 3.

Like the participants in the intermediate levels who had background knowledge about the topic, the difference between those advanced participants who had background knowledge about the text 3 and the participants who did not have prior knowledge about the topic of text 3 was significant, highlighting the significant effect of the background knowledge on the reading comprehensions of the students.

Table 9 summarizes the overall reading scores of the participants across three groups of proficiency. The participants across all the proficiency levels had higher overall reading comprehension scores for text 1 than text 2 and text 3.

Table 10 indicates multiple comparisons among the three proficiency levels of the participants. Concerning text 1, no group performed significantly better than the other groups. It is argued that although the three groups differed in their command of general English proficiency, they all performed almost the same on the text 1 suggesting the idea that text 1 was less specific (It is also shown in Table 2). Therefore, it requires little specific information and contained less difficult grammatical structures on the part of the participants to answer the questions. In this respect, one of the participants commented:

Both the topic and the text were easier to me compared to the other texts. I mean, I knew more about the topic and the information was presented in a simple language. It allowed me to comprehend the text and helped me not to have difficulty

Table 10 Results of post-hoc tests: multiple comparisons

Texts	Proficiency levels	Sig
Text 1	1 and 2	0.13
	1 and 3	0.12
	2 and 3	0.11
Text 2	1 and 2	0.03
	1 and 3	0.00
	2 and 3	0.10
Text 3	1 and 2	0.02
	1 and 3	0.00
	2 and 3	0.09

1 = elementary, 2 = intermediate, 3 = advanced

answering the questions (Moharram, intermediate level, November, 2021).

Corroborating with the former statement, another participant opined:

I personally did not find the text difficult to understand and I could answer the questions easily. I had read some stuff about the topic before, so it was not new to me. Also, it did not have difficult structures in the text making it easy to understand (Fateme, elementary level, November, 2021).

Consistent with the previous statements, another university student remarked:

When I was reading the text, I said to myself that I would not have difficulty answering the questions. I think I had read texts both similar in topic and structure to the one I was reading (Karim, advanced level, November, 2021).

With reference to text 2, the intermediate participants outperformed the elementary group. Although the number of participants who possessed background knowledge about text 2 in the two groups were almost the same (17 vs. 18), there were significant differences between the two groups owing to the fact that text 2 was more specific (It is also shown in Table 2) compared to text 1. It reflects the fact that specificity of the tests and difficulty level were important in LSP tests. In support of this, one of the participants said:

The topic of the text was familiar to me. But when I read the whole text, it contained some points (couched in more difficult grammatical structures) about economic activities in the United States. I did not have difficulty understanding the whole text, but the presence of detailed and specific information made it difficult for me to answer the questions (Ali, elementary level, November, 2021).

In line with the previous statement, another respondents highlighted:

To me the text was easy to read and understand. Compared to Text 1, this text gave me a bit more specific knowledge about economic activities in the United States and had a bit complex grammatical structures. However, they did not make it difficult for me to understand the text (Alireza, intermediate level, November, 2021).

Additionally, there were significant differences between the advanced and advanced participants concerning the gains of the reading comprehension. Compared to text 1, text 2 required more specific information contained highly discipline-specific language structures. As the following comment shows, high occurrences of grammatical structures made it difficult for both elementary participants and advanced participants to answer the questions:

I have read something about the topic of the Text 2. But, there were some cases of complex structures which I could not understand. They made it difficult for me to understand the whole text well. Therefore, I could not answer the questions well (Masoomeh, elementary level, November, 2021).

In this respect, one of the advanced participants had a different view. He quoted:

Text 2 contained interesting information about laws for the conduct of economic activity something that I had read about once in the course called English for Economics students. And, I remember that the teacher had explained the similar structures to us in the classroom (Jameleh, advanced level, November, 2021).

In contrast, there were not any significant differences between the intermediate participants and advanced participants in responding to the questions of the text 2. That is, it was found that the two proficiency groups performed equally on the text 2. It indicates that in addition to having prior familiarity with the topic of the text 2, the two groups possessed the same relevant language knowledge. In this respect, one of the advanced participants stressed:

The text did not appear unfamiliar to me. I have read about it before. The reading text also contained familiar grammatical structures which helped me have little difficulty understanding the whole text. (Zamineh, intermediate level, November, 2021).

Consistent with the former excerpt, another advanced participant stated:

Text 2 was easy for me to understand. It did not take much time to go through the whole text. It is a reality that once a text that I read is familiar to me, I have less difficulty comprehending it (Mohammad Taha, advanced level, November, 2021).

Regarding the text 3, as the most specific and difficult text, the participants who reported varying degrees of familiarity performed differently on the reading text based on their general English proficiency. Concerning the elementary participants and intermediate participants, the results evidenced that the intermediate participants outperformed the elementary counterparts. In other words, in addition to the proficiency level of the participants affecting their performances, the degrees of specificity of the text 3 also played a significant role in their overall comprehension. In this regard, one of the elementary participants remarked:

I did poorly on this reading test. I feel this text was the most difficult one if I want to compare it to Text 1 and Text 2. Somewhere in the text, I knew the meaning of the words (not all of them, of course) but I did not understand the meanings of the whole sentence since it had difficult grammatical structures. It contained some points

about economic activities that I have never read about them already (Ahmad, elementary level, November, 2021).

In line with the previous statement, one of the intermediate participants remarked:

The text was a bit challenging for me. Although I did not find the whole text difficult to comprehend, it had some less familiar information included some specific words and less familiar structures (Farzaneh, intermediate level, November, 2021).

The difference between the elementary participants and advanced participants was also significant where the advanced participants performed significantly better than the elementary participants. It seems that this was due to the fact that the elementary participants did not possess the relevant background knowledge negatively affected their comprehension. Additionally, it may be reasoned that the reading text contained both new discipline-specific information and complex grammatical structures which made its readability difficult for them. The following excerpt shows this clearly:

I was puzzled when I read the reading text for the first time. The information embedded in it was new to me. It became more difficult when this new information had been presented in unfamiliar grammatical structures (Somayyeh, elementary level, November, 2021).

However, an advanced participant commented:

I did not performed well on the text. To me, it was somehow difficult because the topic was relatively new. Additionally, it contained some grammatical structures (e.g., referring to the passives) making difficult its understanding. This, in turn, did not allow me to answer all the questions correctly (Reza, advanced level, November, 2021).

Finally, the findings reported that the advanced participants and intermediate participants did perform significantly better than the elementary participants. Although they had performed well on the test, the results of the semi-structured interview revealed that the text entailed highly specific information presented with complex grammatical structures compared to text 1 and text 2. In support of this, one of the participants expressed:

On the whole, I am happy about how I did on Text 3. I could understand the whole text. However, I should confess that the text included new topics to me. It presented some specific concepts which I had never read about them (Minoo, intermediate level, November, 2021).

Corroborating with the previous statement, one of the advanced participants quoted:

Although the topic of the text was familiar to me, it entailed some very discipline-specific grammatical structures. I did not know them. I think if I knew them, I could understand the text well and answer the questions. (Maryam, advanced level, November, 2021).

As reported above, the results of the study disclosed that background knowledge was a strong indicator of the participants' reading comprehension. In other words, the

participants who reported prior background knowledge about the reading comprehension tests performed significantly better than those who lacked it. This lent support to the findings of the previous studies (e.g., Krekeler, 2006; Schmitt 2011), reporting that background knowledge significantly affected their participants' reading comprehension. Moreover, the findings of the study disclosed that the university students' language proficiency was an important factor determining their reading comprehension. In other words, it was found that prior familiarity with the topic interacted with the proficiency level of the test-takers to determine the success of the test-takers. In addition, the findings of the study indicated the significance of degree of the specificity of the reading texts. That is, in LSP tests, there were other variables which might have influenced the test-takers' performances than the long-lasting war among LSP practitioners that either language proficiency or content knowledge affects the performance on an LSP test. In particular, the results disclosed that the more the texts were specific (both in terms of content and language), the poorer the participants' performances were across all the three proficiency groups. This, in fact, indicates that general language proficiency and general content familiarity cannot contribute as much significantly as were previously thought. This calls for investigation of both language and content knowledge relevant to the specific communicative contexts within which LSP students need to operate. Therefore, it may imply that LSP teachers should teach and develop relevant language knowledge (i.e. grammatical structures characteristic of the specific domains) in LSP students.

The results of the present study can be attributed to the view that the background knowledge of the participants might have played a positive role in raising their motivation and engagement in reading (Guthrie et al., 2004). Thus, in turn, they might have performed better in comprehending the given texts. This argument for the findings can receive support from the findings of Wigfield et al. (2008), reporting that when students get fully engaged in reading, they can comprehend it better, are more motivated to read, and employ reading strategies effectively. Additionally, the findings of the study can be explained with the help of the engagement model (Guthrie & Wigfield, 2000). Aligned with this model, it may be argued that the participants who had a good background knowledge of the economics and high language proficiency levels might have used both motivational processes and cognitive strategies during the comprehension of the given texts. In other words, they might have engaged cognitively, emotionally, and behaviorally. In other words, they might have used high-level strategies to boost deep comprehension, enjoyed the texts and expressed enthusiasm about learning, and actively performed the given tasks (Fredricks et al., 2004).

To further discuss the results of the study, it may be argued that the participants might have integrated the skills and cognitive processes with the linguistic features of the text. That is, along with Van Dijk et al. (1983), it may be argued the participants might have integrated the text information with their prior knowledge to construct a mental representation of the meanings embedded in the given texts. Additionally, it may be referred to the Construction-Integration model (Kintsch, 2009) to explain the findings of the study. As postulated by this model, the participants might have made successful connections between the literal, propositional representation of the given texts and the related schema formed from background knowledge. Moreover, along with the findings of the study, it may be argued that the stronger readers might have stored the required

background knowledge as a series of propositions in their long-term memory and activated them during the reading comprehension of the given texts. Connected and organized into various schemata, these propositions might have facilitated the understanding of the given texts. As the participants with a good background knowledge engaged in the reading processes, they might have properly activated the propositions to contribute to the understanding of the given texts (Kendeou and Van Den Broek, 2007; Rumelhart, 2017; Smith et al., 2021). However, concerning the weaker readers, it may be argued that they might have been less able to select and recall propositions to make correct inferences about the meanings of the given texts and, accordingly, been less able to suppress the irrelevant information during the integration phase of reading comprehension.

Conclusions

The present study explored the role of language knowledge and background knowledge in reading comprehension of specific-purpose tests among Iranian university students majoring in economics. The findings disclosed that along with possessing subject matter knowledge or having prior familiarity with the topic, the LSP test-takers should also be familiarized with knowledge of specific language rules or grammatical structures frequent in their own specific fields of study. The results evidenced that every language test is a test for specific purposes with a difference in the way the test-takers' needs are specified. It was revealed that just being proficient in general English does not guarantee success in LSP tests.

Due to the differences in use of grammatical structures in different types of genres, the proportion of some grammatical structures (passive structures, for instance) in one technical text or specific discipline is higher or lower compared to other subject knowledge areas. Therefore, as for the implication of this study, it is suggested that instead of expecting LSP test-takers to be highly proficient in terms of general language knowledge or spending huge amounts of time on learning general knowledge of language, relevant discipline or context-specific linguistic rules or grammatical structures should be first identified and then taught to the LSP candidates. Therefore, along with equipping LSP learners with subject matter knowledge, they should be taught those areas of language knowledge or grammatical structures that are characteristic of or proportionate to that specific field or subject matter. Another implication of the results is that the reading instruction should improve students' engagement in terms of cognitive, emotional, and behavioral. As they get fully engaged cognitively, emotionally, and behaviorally, they can control the comprehension of any passage. Additionally, another implication is that university teachers should make an attempt to optimize the activation of background knowledge and engagement with a realistic expectation.

In light of the limitations imposed on the study, some suggestions for further research are presented. First, since the present study was conducted in one university, more studies should be carried out in other parts of the country to increase the generalizability of the findings. Second, as the participants of the present study were restricted to economics students, more studies are needed to include more participants in other majors. Third, because the present study was cross-sectional, interested researchers can do longitudinal studies to disclose the effects of background knowledge and language knowledge on reading comprehension in a long term of period. Fourth, since the data of this

study were collected through tests and semi-structured interviews, further studies are needed to collect data through other ways such as observation to present a comprehensive picture of the effects of language knowledge and background knowledge in reading comprehension of specific-purpose tests. Last but not least, interested researchers can conduct a more ecologically sound knowledge-building intervention to show how it will improve the reading comprehension.

Appendix A

1. What do you think governments do in order to control investors' economic activities?
2. On what natural resources had British North America developed its commercial economy by the 1840s?
3. On what did the economy of the Southern states largely depend by the decades just before the Civil War of the 1860s?

Appendix B

Reading text 1

By the decades just before the Civil War of the 1860s, the Southern states had developed an economic culture distinct from that of the North. The economy of the South depended largely on two things: cotton and slave labor. Because of the rising demand for cotton from the mills of England and the invention of the cotton gin in 1793, the cotton production of the South increased tremendously. In 1790, cotton output had been 9,000 bales a year, but by the 1850s, output had soared to five million bales. In the South, cotton was "king." The most readily available source of labor was the institution of slavery. Thus, cotton and slavery became interdependent, and the South grew more reliant on both.

This was in sharp contrast to the North, where farming was becoming more mechanized and diversified. Northern farmers would boast of improvements in the form of new roads, railways, and machinery, and of the production of a variety of crops. In the South, however, farmers bought laborers instead of equipment, and a man's social status depended on the number of slaves he owned. The economic differences between the two regions would ultimately lead to armed conflict and the social restructuring of the South.

1- What is the passage mainly about?

- 1) The Civil War of the 1860s.
- 2) The development of the economy of the South
- 3) Farming during the Civil War of the 1860s
- 4) Economic cultures in the North and the South

2- Why did the southern output of cotton greatly increase between 1790 and 1850?

- 1) Southern farmers invested in transportation.
- 2) Southern cotton was superior to Northern cotton.

- 3) The South was trying to dominate the North.
- 4) Mills in England demanded more cotton.
- 3- What was associated more with the North in the period discussed?
 - 1) Slave labor 2) Farm machinery 3) Military service 4) Reliance on one crop
- 4- The author argues that the Civil War between the North and the South -----
 - 1) was largely the result of economic differences
 - 2) forced the South to produce different crops
 - 3) began in 1790 and lasted almost seventy years
 - 4) was a conflict over control of the cotton trade
- 5- What is the writer's purpose in the second paragraph?
 - 1) To describe the activities of Northern farmers
 - 2) To tell the reader when farming became mechanized
 - 3) To compare and contrast farming in the North and in the South
 - 4) To talk about the economic differences between the North and the South.

Reading text 2

Because most people do not volunteer to pay taxes or police their own financial affairs, governments cannot influence economic activity simply by asking people to pollute less, to give money to the poor, or to be innovative. To accomplish these things, governments have to pass laws. Since the early twentieth century, governments of countries with advanced industrial or service economics have been playing an increasing role in economics. This can be seen in the growth of government taxation and spending, in the growing share of national income devoted to income-support payments, and by the enormous increase in the control of economic activity.

The large-scale organization of business, as seen in mass production and distribution, has led to the formation of large-scale organizations-corporations, labor unions, and government structures-that have grown in importance in the past several decades. Their presence and growing dominance have shifted capitalist economies away from traditional market forces and toward government administration of markets.

In the United States, government provides a framework of laws for the conduct of economic activity that attempt to make it serve the public interest. For instance, the individual states and the federal government have passed laws to shield investors against fraud. These laws specify what information has to be disclosed to prospective investors when shares of stocks or bonds are offered for sale. Another important area of law concerns the labor force, such as regulation of work hours, minimum wages, health and safety conditions, child labor, and the rights of workers to form unions, to strike, to demonstrate peacefully, and to bargain collectively through representatives of their own choosing.

In other nations, the ways in which governments intervene in their economies has varied; however, governments everywhere deal with essentially the same issues and participate in economic activity. Even governments that are reluctant to regulate commerce directly have undertaken large-scale projects such as hydroelectric and nuclear energy developments, transportation networks, or expansion of health, education, and other public services.

- 6- What can be the best title for this passage?

- 1) Big Business Organizations 2) Economic Activities People Do
- 3) The Role of Government in the Economy 4) Laws for the Conduct of Economic Activity

7- According to the passage, governments intervene in economic activity because

- 1) the economy would fail without the help of government
- 2) people do not willingly regulate their own business affairs
- 3) businesses pay governments to participate in economic activity
- 4) governments understand the economy better than anyone else does

8- The word "this" in line 5 refers to -----.

- 1) economic activity 2) increasing role in economics
- 3) asking people to pollute less 4) the early twentieth century

9- According to the passage, how has the growth of large-scale organizations such as corporations and labor unions affected capitalist economies?

- 1) It has led to the increasing role of government in economic activity.
- 2) It has forced governments to pass laws protecting traditional markets.
- 3) It has caused unfair competition between large and small businesses.
- 4) It has destroyed capitalism and replaced it with government ownership.

10- In paragraph 3, the author mentions laws to shield investors against fraud as an example of laws that -----.

- 1) organize business 2) protect the labor force
- 3) set the price of stocks 4) serve the public interest

Reading text 3

By the 1840s, British North America had developed a vibrant commercial economy based on its abundant natural resources and a growing international trade. Fish, furs, timber, and grains represented over 90 percent of all economic activity. The oldest of the resource commodities, fish, was traditionally associated with Newfoundland and continued to dominate that colony's economy throughout the nineteenth century. The other traditional resource, fur, had a much smaller economic value compared to other resources. However, the fur trade was of tremendous value politically because it provided the means for Great Britain to retain its claim over much of Canada, and also fanned the basis of the relationship between the British and the aboriginal peoples.

Timber and grain eventually replaced fish and fur in economic importance. Every province of British North America except Newfoundland was involved in the timber trade. In New Brunswick, the timber industry controlled every aspect of life, and settlement was closely connected to the opening of new timber territory. In the extensive agricultural lands of the St. Lawrence Valley and Upper Canada, wheat quickly became the dominant crop. Wheat met a growing demand abroad and it transported well as either grain or flour.

11- Which source was the earliest to contribute to the economy of British North America?

- 1) Fish from Newfoundland 2) Fur from across Canada
- 3) Wheat from Upper Canada 4) Timber from New Brunswick

12- According to the passage, what is the main reason for the importance of the fur trade?

- 1) Fur had more economic value than any other natural resource.
 - 2) Fur formed the basis of the local economy everywhere in Canada.
 - 3) The fur trade supplied all of the fur needed in Great Britain.
 - 4) The fur trade allowed Great Britain to control a large part of Canada.
- 13- Which statement best describes the British North American economy around the 1840?
- 1) Economic activity varied greatly from one province to another.
 - 2) The economy was based mainly on the exportation of timber and wheat.
 - 3) Four important resources supported most of the commercial activity.
 - 4) Great Britain maintained strict control over all aspects of the economy.
- 14- The word "dominant" in line 13 is closest in meaning to -----.
- 1) expensive 2) original 3) main 4) special
- 15- According to the passage, in New Brunswick -----.
- 1) the timber industry had great economic importance
 - 2) everybody was involved in the timber and wheat trade
 - 3) a new timber territory opened and controlled all aspects of economy
 - 4) the timber trade paved the way for the development of wheat trade

Appendix C

Interview Questions

1. How did you feel about the reading texts?
2. Which reading text was difficult to you to answer? And Why?
3. Why do you think you did or did not answer them well? What was the problem?
4. Was the content of the tests unfamiliar to you? Did they need specific information to understand?
5. What do you think about the language of the reading texts? Were there any grammatical structures that made the readability of the texts difficult?

Abbreviations

LSP	Language for specific purposes
ESP	English for specific purposes
EAP	English for academic purposes
L1	The first language
L2	The second language
ESE	English for students of economics
LSAP	Language for special academic purposes
<i>M</i>	Mean
<i>SD</i>	Standard deviation
ANOVA	Analysis of variance

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Authors' contributions

HT collected and wrote the manuscript. KT interpreted the data and proofread the final draft. All authors read and approved the final manuscript.

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