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The Impact of L1 Reading Directionality Mode on L2 Reading Fluency

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Cross-orthography research has thus far focused on the effect of learners' first language (L1) reading ability in alphabetic or non-alphabetic languages on their second language (L2) reading performance, paying scant attention to the different aspects of L2 reading performance in learners of two alphabetic languages that have different writing systems or reading directionality modes. This study, however, examines the impact of L1 reading directionality on English reading fluency–represented here by a combination of reading rate, reading accuracy, and reading comprehension–in Turkish and Arab learners of English. Different reading texts from both first and second languages were employed to compare undergraduate intermediate students' (n = 40) performance on different components of reading fluency. Students were also interviewed upon the completion of the tasks in order to obtain in-depth insights into the way they approached reading and the challenges they encountered while reading in each language. Analysis of the data indicated that in spite of significant differences in some areas, the learners' L1 reading directionality mode did not have a significant effect on all aspects of their reading fluency in English. However, the observed differences between the mean scores of reading fluency components could have pedagogical implications for classroom practice.

Keywords: writing system, reading directionality mode, Arabic, Turkish, EFL

Introduction

Reading is one of the most demanding and complicated skills for foreign or second language learners because decoding or understanding a text in another language not only entails possessing necessary linguistic and epistemological knowledge but also involves developing effective reading strategies, most of which have been already shaped in learners' first language. Indeed, learning a language is different from learning to read in that the former is acquired more naturally, whereas mastering reading skills requires instruction and continuous feedback (Bassetti, 2005). Based on their first language, most language learners have to deal with a second reading or writing system (Cook & Bassetti, 2005). In the case of adult EFL learners, their first language reading ability could either support or interfere with the development of their L2 reading fluency and comprehension if the writing systems, alphabets, and orthographies of the two languages are incompatible in one way or another.

There is sufficient evidence that learners' L1 reading ability has a positive influence on their L2 reading comprehension, reading retention rate, and the use of reading skills and resources (Dufva & Voeten, 1999; Jiang & Kuehn, 2001; Perfetti, Liu, & Tan, 2002). However, the success or failure of this L1 transfer or "strategy borrowing", so to speak, depends on the existence of many factors. The orthographic distance between two languages has been observed to be a strong variable that accounts for the disparity between learners' L2 reading performance across different L1 groups (Bultena, Dijkstra, & Van Hell, 2014; Koda, 2005, 2007; Wang & Koda, 2005). In other words, it appears that the transfer of reading skills between two languages with similar or close scripts and reading directionality modes, such as English and Italian, is more likely to happen than between distant languages with different scripts and reading directionality modes, such as Arabic and English (see Bialystok, McBride–Chang, & Luk, 2005; Cummins, 1991; Durgunoğlu, 2002; Wang, Perfetti, & Liu, 2005). Different scripts also require learners to use different reading strategies and to experience different

amounts of cognitive burden during the learning process. For example, a transparent language such as Turkish, which contains consistent and clear letter-sound correspondences in its orthography (Lallier, Valdois, Lassus-Sangosse, Prado, & Kandel, 2014), is likely to demand less mental processing on the part of learners than less transparent languages such as Arabic or English. In addition, the arrangement of graphemes in different languages assumes various forms such as left-to-right, right-to-left, or top-down, suggesting that learners of different languages should reach a sufficient L2 proficiency level in order to decode the writing system of these languages as quickly and efficiently as they do their L1 writing system.

Although many studies have speculated about the existence of cerebral functions that are responsible for handling different reading directionality modes in non-reading tasks (see Chokron & De Agostini, 2000; Ibrahim & Eviatar, 2009; Kazandjian et al., 2009; Tse & Cavanagh, 2000), there is a scarcity of research regarding the existence of these functions for reading tasks. Cross-orthographic research, too, has so far focused on the ways L2 learners deal with two different writing systems in alphabetic and non-alphabetic languages, in terms of the transfer of reading skills from one language to another. However, the impact of an L1 writing system on different aspects of L2 reading fluency in learners of a second alphabetic language with a different reading directionality mode has remained an ignored area of investigation. While acknowledging the fact that the Turkish script has more in common with the English script than does the Arabic script, which might favourably affect the reading ability of Turkish learners of English, this study is more concerned with investigating the impact of L1 reading directionality mode on the L2 reading fluency of Turkish and Arab learners of English.

Literature Review

Previous research has suggested that learners' L1 writing system could

affect their reading ability in another language, particularly their use of reading skills (Perfetti et al., 2002; Wang et al., 2005). For example, learners' L1 writing system influences their L2 linguistic awareness to the extent that they may find it easy or difficult to identify and manipulate phonemes and syllables depending on whether they are users of alphabetic or syllabic writing systems(Bassetti, 2005; Bugarski, 1993). Multi-competence theory also argues for language learners' ability to handle two or more writing systems to the extent that they can reach a bilingual or multilingual proficiency in both languages (Cook, 1991). In addition, bilingual literacy theories assume that learners can make further cognitive and academic progress in their L2 reading once they have developed their L1 reading skills. The Developmental Interdependence Hypothesis (Cummins, 1979), for instance, supports the role of L1 linguistic and literacy competence in L2 learning, but it proposes that learning to read in each language is independent, irrespective of some shared common ground between two languages. The Linguistic Threshold Hypothesis (Cummins, 1979), on the other hand, assumes a threshold for L2 linguistic competence a learner must attain before having access to their L1 reading skills. Research in this area, however, has ignored to some extent the role of the L1 writing system and its directionality mode in the success or failure of L2 readers' transfer of or access to their L1 reading skills and strategies. For example, the Linguistic Threshold Hypothesis has failed to account for the possible relationship between L1 reading directionality mode and cerebral configurations. Simply put, learners may carry over some elements or peculiarities of their L1 reading skills into the process of learning L2 reading. This transfer, which has the potential to hinder or facilitate the normal development of their L2 reading, can therefore suggest the existence of "a critical period" for L2 reading competency before which the influence of L1 writing directionality on L2 reading ability is less severe than after this period. Thus, although learners' development in L2 reading should not be necessarily attributed to the effect of their L1 reading skills, it appears that the less proficient learners are in their L2 reading, the more likely they will resort to their L1 reading skills and resources.

Another line of cross-orthographic enquiry addresses the comparison of reading in alphabetic and non-alphabetic languages in order to demonstrate 'the maximum possible contrast among the world's modern languages and their corresponding orthographies' (Francis, 2010, p. 8). Studies in this field have documented the transfer of reading skills across alphabetic languages, and strongly support a positive correlation between readers' L1 and L2 reading ability (Dufva & Voeten, 1999; Jiang & Kuehn, 2001). Language learners have also reported the transfer of reading skills between alphabetic and non-alphabetic languages (Bialystok et al., 2005; Wang et al., 2005). However, this transfer is highly likely to occur between languages that share more orthographic and phonological similarities than dissimilarities (Cummins, 1991; Durgunoğlu, 2002) because phonology is an intervening aspect of reading fluency whereby learners can figure out meaning from visual signs (Francis, 2010).

Cross-orthographic differences affect not only the learners' amount of comprehension but also their reading rate and fluency, so that fluent readers have reportedly recorded higher comprehension scores on reading tests (Gorsuch & Taguchi, 2008; Shiotsu, 2009). Reading fluency was defined as 'the ability to read rapidly with ease and accuracy and to read with appropriate expression and phrasing.' The basic components of reading fluency, according to Kuhn and Stahl (2003, p. 416), include '(a) accuracy in decoding, (b) automaticity in word recognition, and (c) the appropriate use of prosodic features such as stress, pitch, and appropriate text phrasing'. However, reading fluency is a multifaceted construct that involves a long incremental process affected by different cultural, contextual, and individual factors (Jenkins, Fuchs, van der Broek, Espin, & Deno, 2003; Kuhn & Stahl, 2003; Nathan & Stanovich, 1991; Wolf & Katiz-Cohen, 2001; Wurr, 2003) such as L1-L2 distance, learners' L2 proficiency, and learning context (Yamashita & Ichikawa, 2010). For example, skilled readers can read at a rate of 250-300 words per minute (WPM) in both their L1 and L2, although this speed depends on the difficulty of texts in terms of unknown vocabulary or grammatical complexity (Grabe, 2010). Good readers also expose

themselves to a greater amount of reading, and likewise understand and enjoy reading more than slow readers (Nuttall, 1996). Acknowledging fluency's impact on bolstering students' reading comprehension, educators have recently begun to emphasize reading fluency in foreign and second language learning programs (Macalister, 2010; Nation, 2007). Because the successful comprehension of a text entails decoding it within the shortest time possible, reading fluency can also be predictive of reading comprehension. Research in L1 reading has confirmed that oral reading fluency is a better predictor of reading comprehension than other components of reading skill (Armbruster, Lehr, & Osborn, 2001; Fuchs, Fuchs, Hosp, & Jenkins, 2001). Reading fluency is also a means of testing accuracy in reading (Hussien, 2014; Nation, 2009; Perfetti, Landi, & Oakhill, 2005; Stanovich, 2000). However, reading fluency consists of different layers so that its typology recognizes 'the importance of word reading fluency, passage reading fluency, extensive reading, and reading rate training on vocabulary and reading comprehension improvements' (Grabe, 2010, p. 77).

In another avenue of research, the relationship between language and culture–as two cognitively determined phenomena (Perez-Arce, 1999)–has also been revisited to investigate the extent to which reading directionality mode could influence learners' cognition. Since the right and left hemispheres of the brain are different in their functions and specializations (Chokron, Kazandjian, & De Agostini, 2009; Kimura, 1973), reading or writing in a specific direction appears to be friendlier to one hemisphere than to the other. However, different scholars vary in their opinions about the trajectory, degree, and gravity of this effect. Duranti (1997), for example, maintains that language may determine the cognitive framework, or the way the brain processes the information and perceives the stimuli. On the other hand, the cultural hypothesis suggests that some deep-rooted cultural behaviors such as reading may affect cognitive strategies, or the approach learners follow to scan or decode a reading text in another language (Kazandjian et al., 2011). By giving more weight to culture and its sensitivity to the surrounding environment, Oyserman, Sorensen, Reber, & Chen (2009)

also support the interaction between culture and cognition to the point that they call culture the situated cognition. In addition, the Hemispheric Activation Theory (Kinsbourne, 1970) has explained the perceptual bias or asymmetry on line bisection tasks between participants with opposing L1 reading directionality modes. This directional bias was found to affect visual (Corballis, 1994) and auditory modality (Bertelson, 1972) in non-verbal materials, which further accounts for the interdependence and the mutual impact of culture and language on individuals' perceptual or cerebral behavior. Having employed transcultural neuroimaging techniques, Han & Northoff (2008) further confirmed the disparities in neural activations across different languages while engaging participants in non-word reading tasks. However, because most studies in this field extensively examined the role of reading direction in individuals' visuospatial performance by using only non-language tasks (Chokron & De Agostini, 2000; Kazandjian et al., 2009; Tse & Cavanagh, 2000; Vaid & Singh, 1989), it would also provide insight if language-related tasks such as reading were the object of enquiry.

The above literature review illustrates that cross-orthographic research has thus far focused on languages that are close or distant from each other, both culturally and linguistically. Furthermore, research on L1s with different writing systems or reading directionality modes has utilized non-reading tasks, making it difficult to infer pedagogical implications from their findings. The current study, however, aims to investigate the impact of L1 reading directionality mode on L2 reading fluency–represented here by a combination of reading speed or rate, reading accuracy, and reading comprehension–of Turkish and Arab learners, who use two opposing directions while reading or writing in their first languages. The design of the study intends to answer the following two research questions:

1. Do learners with opposing L1 reading directionality modes vary in their L2 reading fluency?
2. Does learners' L1 reading directionality mode affect the way they approach L2 reading?

Method

Turkish, English, and Arabic languages

The Turkish language, written from left to right, consists of 29 letters–8 vowels and 21 consonants. Turkish is a transparent language in that each letter represents a single sound. Similarly, the English orthographic system has 26 letters (5 vowels and 21 consonants), which follow a left-to-right alignment. English stands in the middle of the grapho-phonemic correspondence or transparency continuum because phonological rules follow and serve morphological rules in this language (Chuang, Joshi, & Dixon, 2012). Arabic, on the other hand, is an opaque or deep language, which has 28 letters (28 consonants, 8 vowels and diphthongs) written from right to left, with no upper and lower cases.

Participants

The participants of this study, 20 Turkish and 20 Arab undergraduate students, were randomly selected from five intermediate classes at the Preparatory School at an international university in Cyprus. Since the medium of instruction at this university is English, students must submit a certificate of English proficiency at the time of registration. Those who fail to provide this certificate have to take a proficiency exam given by the Preparatory School at the beginning of every academic semester. This proficiency exam, which also functions as a placement test for students who score less than 80 out of 100, evaluates the four main skills of listening, reading, writing, and speaking, as well as areas such as grammar and vocabulary. Students who score between 50-60 on this exam are placed in intermediate level classes. Intermediate students were selected to participate in this study because, as suggested by the Linguistic Threshold Hypothesis (Cummins, 1979), they have reached a certain level of proficiency that allows for the transfer of L1 reading skills to L2 reading. The participants selected

were all right-handed males to control gender and handedness variables. In addition, they neither attended a private language school nor had lived in an English speaking country, and these were two solid reasons why they were still studying English in this intensive program. The average age was 22.1 for Turkish and 23.9 for Arab participants.

In both Turkey and Jordan, the home nations of the Turkish and Arabic-speaking participants of this study, students begin studying English as a foreign language as early as 10. That is, students enter university with nearly 8 years of experience studying English for 2-4 hours per week. There are also other common similarities between these two contexts as far as English language education is concerned. For example, grammar-translation is still the most popular English language teaching methodology in both contexts, indicating teachers' heavy use of students' first language in the classroom. The Ministry of Education in both countries is also responsible for developing textbooks, which are generally different from the commercial ELT (English Language Teaching) textbooks because of their emphasis on reading, grammar, vocabulary, and translation skills. However, in spite of the similarities in various aspects of their foreign language education and socio-cultural background, these two groups of learners use two opposing L1 reading directionality modes.

Data collection instruments and procedures

In order to assess students' performance on different components of reading fluency, three reading passages were selected from two intermediate and upper-intermediate reading textbooks, which were not used at the students' school. The researcher and a native English-speaking colleague shortened these texts to ensure they included only one main idea (Therrien, Gormley, & Kubina, 2006). The first text was a 360-word intermediate English passage that was used to assess the participants' L2 reading speed. The second text, with the same length and level, included 10 reading comprehension questions that were used to measure the participants' L2

reading comprehension, as well as to calculate the time needed to read the text and answer the questions. The third text, a 492-word upper-intermediate reading passage with 10 reading comprehension questions, was utilized to assess the participants' L1 reading speed and comprehension. This text, which was translated from English into Turkish and Arabic by two experts, was selected at one level above the participants' current L2 reading level because of the conventional belief that learners normally read more efficiently in their L1 than they do in their L2. Because comprehension was considered one of the dependent variables in this study, simple questions were designed (Yamashita & Ichikawa, 2010). The questions were all multiple-choice, with one point assigned to each correct answer and, zero assigned to an incorrect answer. Students took the test individually to facilitate the recording of their reading time and to interview them upon their completion of the reading tasks.

Participants were administered the first L2 text and were asked to read it aloud in order to record their reading rate, or the number of words they read per minute, and to measure their reading accuracy. They were asked to read the text aloud in order to investigate their reading accuracy by reviewing their recorded voice later. Reading accuracy was rated on a scale of 1 to 5 based on the number of errors they committed and according to the automaticity and prosodic quality of their reading (Grabe, 2009). Some of the error types included insertions, repetitions, mispronunciations, and word omission (see Conderman & Strobel, 2008). Two native-speaking teachers assessed the participants' recordings to determine their accuracy score; however, errors related to the participants' accents or articulatory peculiarities, such as Arabs pronouncing [ɪmˈbruːv] instead of [ɪmˈpruːv] or Turks pronouncing [ˈneɪtʃ(ə)rəl] instead of [ˈ*nætʃ(ə)rəl*] were excluded. Next, participants were given the second L2 text to read and answer the reading comprehension questions. Finally, the L1 reading passage was administered, and participants were asked to read and answer the reading comprehension questions. The number of correct answers to the reading comprehension questions was considered their reading comprehension score. Moreover,

another measurement of time (reading time) was recorded for the last two texts, which was the entire time each a student spent reading and answering the reading comprehension questions. Because the participants' performance on their L1 reading rate and accuracy was taken for granted, these variables were not recorded.

In addition, each participant was interviewed when he completed the tasks in order to obtain more in-depth information with respect to the way he approached reading and the likely challenges or obstacles he encountered while reading in both languages. The interviews were semi-structured and were conducted in a friendly and casual manner. The interview protocol consisted of three core questions and several follow-up questions used whenever it was necessary to elicit additional information from the students. The interviews were digitally recorded and transcribed. The content analysis was then carried out to extract the most frequent themes for triangulation and further interpretation of the results and findings.

Results

Table 1 shows descriptive and independent samples *t*-test results of the participants' mean scores on different L2 reading fluency components. The results indicated that the average reading rate or the time students spent reading the first L2 text aloud was 4 seconds less for Turkish (M = 2.31, SD = .16) than for Arab students (M = 2.35, SD = .14). In addition, the amount of time students needed to read the second L2 text and answer the reading comprehension questions was higher for Arabs (M = 10.30, SD = 1.27), $t(38)$ = .48, p = .63) than for their Turkish counterparts (M = 10.04, SD = 2.06). The mean difference for reading comprehension scores was also half a point (.55), which was again higher for Turkish (M = 5.80, SD = .89) than for Arab students (M = 5.25, SD = .97), $t(38) = 1.87$, p = .07. However, the differences for all variables above were not significant at the .05 level.

TABLE 1

Independent Samples t-test Results of L2 Reading Fluency Components

L2 Reading Fluency Components	Group	*M*	*SD*	*t*	*df*	*p*
L2 Reading Rate	Turkish	2.31	.16	.86	38	.40
	Arabic	2.35	.14			
L2 Reading Time	Turkish	10.04	2.07	.48	38	.63
	Arabic	10.30	1.27			
L2 Reading Comprehension	Turkish	5.80	.89	1.87	38	.07
	Arabic	5.25	.97			
L2 Reading Accuracy	Turkish	3.80	.57	2.50	38	.02
	Arabic	3.25	.80			
L1 Reading Time	Turkish	7.30	1.18	.49	38	.63
	Arabic	7.12	1.16			
L1 Reading Comprehension	Turkish	7.50	.51	5.87	38	.00
	Arabic	6.55	.51			

In contrast, on a scale of 1 to 5 and at the .05 level, Turkish students (M = 3.80, SD = .57) demonstrated a significantly higher L2 reading accuracy than Arab students (M = 3.25, SD = .80), $t(38) = 2.50$, p = .02. This included the quality of students' pronunciation and intonation, as well as their use of prosodic features and automaticity in reading aloud. The results of students' L1 reading time and comprehension also revealed that, although Arab students (M = 7.12, SD = 1.16) read the entire passage and answered the questions faster than Turkish students (M = 7.30, SD = 1.18), $t(38) = .49$, p = .63), they scored lower on reading comprehension. With a mean difference of nearly one point on the reading comprehension test, the t-test analysis showed a statistically significant difference between these two groups of students($t(38) = 5.87$, p = .00) at the .05 level.

In addition, the results of the debriefing interviews revealed that students were mostly unaware of the importance of reading fluency in English, found reading in their first language different from reading in English, and reported several obstacles to reading fluently in English. In response to the first interview question, an overwhelming majority of the interviewed students did not consider themselves fast readers, although Turkish students demonstrated more confidence in their reading speed. In particular, students indicated that this aspect of reading was barely emphasized in their previous schooling. They commented that the purpose of reading in English during their pre-university education was limited to reading short texts carefully in order to answer comprehension questions or to improve their vocabulary.

In response to the second interview question, all students acknowledged the difference between their English reading ability and reading in their mother tongue. Unequivocally, they found reading in their first language easier and much less challenging than reading in English. This was also evident in their use of aids such as pens, pencils, or their fingers in addition to their use of regression strategies such as rereading a line, sentence or paragraph while reading in English. Indeed, they resorted to these reading aids less frequently when reading the L1 text, and employed them more specifically to enhance their concentration when responding to reading comprehension questions.

Students also found it more cumbersome to read in English due to encountering unknown vocabulary and complex structures. However, Arab students felt the confusion while reading in English more than their Turkish counterparts. For example, they mentioned forgetting what they read in the previous paragraph or in general losing the thread more often. While Turkish students' main challenge was encountering new vocabulary, Arab students indicated both the new words and structures. Several Arab students also referred to the different directionality mode as another reason for their slow pace and even boredom while reading in English. However, despite the expectation that Arab learners would miss lines or jump to the next line as they read in English due to the habit of moving their eyes from right to left in

their L1, the interviewed students in both groups rarely reported jumping a line. On the contrary, all students endeavored to concentrate and to be more meticulous in order to locate the right information and to answer each question correctly.

Discussion

The present study investigated the impact of learners' L1 reading directionality mode or writing system on their English reading fluency. In response to the first research question, the results revealed that learners' L1 reading directionality mode affected different components of their English reading fluency, but the difference between mean scores was not statistically significant for several variables. The results indicated that Turkish students read English texts faster, with higher amount of comprehension and a higher rate of accuracy. Prior research in other EFL contexts also reported that reading fluency correlated with both reading comprehension (Gorsuch & Taguchi, 2008; Shiotsu, 2009) and reading accuracy (Hussien, 2014). Turkish students not only outperformed Arab students in most aspects of L2 reading fluency, but also scored higher on L1 comprehension and accuracy. This finding is consistent with previous research (e.g., Bialystok et al., 2005; Dufva & Voeten, 1999; Jiang & Kuehn, 2001; Wang et al., 2005) on readers' use of their L1 reading resources to deal with reading in a new language, especially when the languages share similar scripts and writing systems. However, the faster L1 reading time for Arab students indicates the fact that the degree to which L1 and L2 reading fluency correlate with each other depends on many factors, including the spatial features of orthography and the degree of transparency of each language. In other words, because Turkish is a transparent language, the words are more likely to appear longer on paper than Arabic words. This means that an equivalent text in Arabic takes less space, though not necessarily fewer words, and therefore demands less reading time.

The results offer two possibilities concerning the impact of L1 reading

directionality on L2 reading fluency. The first possibility suggests that if we accept that L1 reading directionality influences L2 reading fluency, it is then reasonable to conclude that reading performance is affected by learners' cerebral or perceptual behavior, which was witnessed by previous research on non-reading tasks (e.g., Chokron et al., 2009; Chokron & De Agostini, 2000; Kazandjian et al., 2009; Tse & Cavanagh, 2000; Vaid & Singh, 1989). That is to say, if Arab learners' reading fluency in English does not match that of their Turkish counterparts, who read and write from left to right in their L1, chances are that L1 reading directionality mode creates a default in learners' brain, making reading in another direction challenging and cumbersome. The Developmental Interdependence Hypothesis (Cummins, 1979) also assumes a pivotal role for L1 reading ability in developing L2 reading. This could further imply that reading fluency is a cognitive ability whose development is affected by age and the brain lateralization phenomenon, as picking up the L1 accent and native-like competency in language learning is believed to be difficult for L2 learners after a certain age. On the other hand, if we assume that there is no association between L1 reading directionality mode and L2 reading fluency, other contextual variables such as the rigor and vigor of an educational system and learners' factors, such as their previous literacy and world knowledge, may account for the differences between learners' L2 reading fluency scores (Wurr, 2003; Yamashita & Ichikawa, 2010). This argument could be supported by the Linguistic Threshold Hypothesis (Cummins, 1979), which gives more weight to language proficiency in learning to read.

In response to the second research question, the interview results shed more light on the way students from two different L1 writing systems approach reading in English. Most importantly, Turkish students expressed more confidence in fluent reading than their Arab counterparts. This could be explained by the cognate effects or the coactivation of representations (Bultena, et al., 2014; van Hell & Tanner, 2012) in the English and Turkish languages, which share to some extent a similar script, as well as by the possibility that intermediate students have reached a satisfactory proficiency

level to benefit from this facilitation factor (Cummins, 1979). However, further experimental research is needed to examine the mechanism and conditions under which Turkish learners of English can benefit from this cognate effect. Furthermore, students held their English education at pre-university level responsible for failing to improve their reading fluency or to recognize it as a crucial aspect of reading ability, despite the fact that reading fluency has recently gained recognition as a major component of reading in many English as a second language contexts (Macalister, 2010; Nation, 2007).

The results also revealed that students were cognizant of the differences between reading in English and in their first language. In order to cope with the difficulty of reading in English, they resorted to reading aids such as using an object to enhance their concentration or rereading a part of the passage to increase their chance of answering the comprehension questions correctly. While these reading aids, as part of reading habits they carried over from their previous reading experiences, slowed down their reading speed, the impact of individual differences in dealing with L2 reading texts should not be ignored (Jenkins et al., 2003; Nathan & Stanovich, 1991). For example, some students' lingering on reading questions could be attributed to their level of motivation and determination to obtain a higher score on the test rather than a necessarily slower reading rate, although higher reading fluency rates are generally associated with better reading comprehension (Armbruster et al., 2001; Fuchs et al., 2001).

Not surprisingly, students perceived reading in English as a slower and more difficult process due to encountering new lexical and syntactical features or experiencing a new orthographic system. These cross-linguistic effects were more discernible for Arab students whose first language has a more distant syntax and orthography with English. As such, reading in English proved a heavier burden on their working memory to easily retain information from one paragraph to another. Recent studies have also confirmed that reading direction (Leung, Sugiura, Abe, & Yoshikawa, 2014) and reading speed (Ashby, Yang, Evans, & Rayner, 2012) are among the

main factors influencing perceptual span in reading, or 'the visual area providing useful information to a reader during eye fixation' (Leung et al., 2014, p. 585). This suggests that less fluent or skilled readers have a smaller perceptual span (Fukkink, Hulstijn, & Simis, 2005; Leung et al., 2014) because they expend more attentional and cognitive resources to process the reading materials. Likewise, Yamashita and Ichikawa (2010) found that more fluent EFL learners have the capability to attend to upcoming words more effectively than less fluent EFL readers. Lack of fluency in reading may, therefore, force students to allocate more cognitive resources to decoding and processing what they read, which may overwhelm them to the point of minimizing their motivation to make any further effort.

Conclusions and Implications

The findings of this study not only support the impact of L1 reading directionality mode on L2 reading fluency but also give us a deeper insight into the complicated dynamics of learning to read in a second or foreign language (Bernhardt, 2005; Koda, 2005, 2007). Overall, the findings supported the results of previous research concerning the positive effect of fostering effective L1 reading skills on the development of corresponding L2 reading skills (Bernhardt, 2005; Cook, 1991; Perfetti et al., 2002; Wang et al., 2005). The findings also suggest that syllabus designers and teachers in EFL contexts should incorporate graded reading materials into intensive and extensive reading programs to enhance students' input frequency and practice, which could lead to developing automaticity in reading (Koda, 2005). It is also imperative that educators and curriculum developers give L2 reading fluency a proper role in second or foreign language reading curricula (Grabe, 2010; Kuhn & Stahl, 2003; Nation, 2009) as developing bilingual abilities in reading fluency can, in turn, improve learners' reading comprehension, which is the most debated reading component in literature on reading (Cook, 1991; Hussien, 2014).

Another pedagogical implication of the findings concerns the assessment of language learning components, suggesting that test designers and teachers should advocate the use of integrative English placement and proficiency tests, rather than following conventional testing approaches, to avoid discriminating against those learners with a different writing system or reading directionality mode. In other words, relying unnecessarily on visual aspects when testing language skills and sub-skills, such as reading, vocabulary, grammar, and writing, means highlighting the differences between learners' L1 and L2 writing system or orthography. Alternatively, more weight should be assigned to the productive skills of speaking and listening along with other communicative aspects of language learning while assessing learners' L2 performance.

In conclusion, learners' L1 reading directionality mode seems to affect their L2 reading fluency. That is, learners who read from left to right in their first language, rather than the other way around, can read English at a faster rate with a higher rate of accuracy and comprehension because of the compatibility of their L1 reading directionality mode with the English reading/writing system. However, there are many other factors than directionality and cross-linguistic transfer of processing skills and language awareness affecting reading comprehension, accuracy and fluency in a second or foreign language. Cook and Bassetti (2005) believe that this L2 processing is interactively shaped and involves a range of different factors and influences.

Since this study used a small sample size, the findings cannot be generalized to the whole population of Turkish and Arabic-speaking students in the contexts from which the participants came. Therefore, further cross-orthographic studies of students at different proficiency levels should be carried out to corroborate the findings of this study and to examine the interface between the gravity of this effect and the level of proficiency. Future research may also consider investigating the effect of contextual variables and individual learners' factors on learners' L2 reading fluency in languages with different reading directionality modes.

The Author

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Appendix

Semi-structured Interview Protocol

1. Do you consider yourself a fast reader in English? Why/why not?
2. Do you your think your reading ability in English is different from your reading ability in Turkish/Arabic? If so, what could be the difference(s)?
3. What types of problems do you encounter when you read in English? For example,
   – Do you ever miss the next line while reading? If so, how often?
   – Do you reread a line or sentence? If so, how often?
   – Do you get confused while reading? If so, what could be the reason(s)?