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Iraqi EFL university students' word recognition strategies and vocabulary proficiency: A correlational study

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Abstract: Word recognition is a cognitive activity widely acknowledged as a hallmark of fluent L2 readers. Understanding a text can only be accomplished with the ability to decode printed words efficiently. Another factor affecting students' comprehension is vocabulary. Therefore, this research aims to investigate whether there is any significant relationship between word recognition strategies and vocabulary knowledge among Iraqi university students. This study made use of four instruments to collect the data. A comprehensive framework for evaluating students' vocabulary proficiency consists of two tests: one measures the reception and production of vocabulary information and the other assesses orthographic coding and phonological decoding procedures. The results show that the respondents use both strategies to an average degree with over-reliance on the orthographic one in recognizing English words by employing a descriptive correlational research design with 400 respondents. Furthermore, a positive relationship was observed between word recognition strategies and vocabulary proficiency.

Keywords: *Creative thinking, Orthographic coding strategy, Phonological decoding strategy, University students, Vocabulary knowledge, Vocabulary proficiency, Word recognition.*

1. Introduction

A considerable discussion has grown around the poor efficient reading levels of English as a foreign language (EFL) university student especially in Iraq and whether such inefficient reading abilities are due to a lack of vocabulary proficiency or reading difficulties. Researchers such as Baumann, et al. [1], Beal, et al. [2], Ding [3], Harmon, et al. [4] and Glende [5] have concentrated on vocabulary proficiency as the main predictor of reading ability. For instance, Glende [5] suggests that a critical aspect of reading comprehension is the knowledge of both vocabulary and syntax. Abdulla [6], Abood [7] and Salih and Riyadh [8] argue that processing strategies for word recognition may affect foreign language reading ability. Perfetti, et al. [9] and Han [10] have found that unfamiliarity with the context of texts and the student's inability to grasp the phonological representation of English are also considered reasons behind low proficiency reading levels. The English language has different components that may affect its orthographic and phonological structures. EFL readers must learn many processing strategies for recognizing words in English (e.g., [11, 12]). Thus, the significance of this research study lies in its investigation of whether Iraqi EFL university students differentiate themselves based on their word recognition strategies (WRS) due to their understanding of orthography and phonology mainly since the orthographical and phonological elements of their two languages are different.

However, the purpose of this research study is to find out Iraqi EFL university students' level of vocabulary proficiency and their use of word recognition strategies. Secondly, there is a relationship between word recognition strategies and vocabulary proficiency.

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According to researchers, there are no studies that exist or have been conducted that explore the relationship between students' word recognition strategies and vocabulary proficiency. The motivation behind conducting this study was the need to provide empirical data on the issue of EFL teachers.

2. Review of Literature

2.1. Word Recognition Strategies

According to Bernhardt and Kamil [13] many EFL students apply reading strategies from their first language which can help them to read in the second language. However, since different languages have different orthographic and phonological structures, students must learn new strategies to read efficiently in their new language Perfetti, et al. [9]. Phala [14] states that skilled EFL readers can recognize words and comprehend their meanings with minimal cognitive effort.

According to Lee-Thompson [15] there are two primary branches of WRS. These two branches are the bottom-up and top-down strategies derived from reading models in the 1960s, 1970s and subsequent decades Al-Qahtani [16]. Lee-Thompson [15] and Al-Qahtani [16] mention that the linguistic knowledge of any language and its writing system is the basis for these reading strategies. Penke and Schrader [17] have defined word recognition strategies as cognitive processing strategies that students use to determine word usage and preferences. These strategies can help identify whether the presented letter strings make up a word. Vandervelden and Siegel [18] report that successful WRS enhances students' ability to pronounce words they have previously faced in written form. Reading comprehension of a text depends on word recognition accuracy supported by syntactic and semantic knowledge [14, 19].

2.2. Classification of Word Recognition Strategies

According to Coltheart, et al. [20] when readers read a written word, they can take two primary routes for recognizing it. The first is the indirect route which involves using phonological decoding to access the reader's mental lexicon. The second is the direct route which involves using orthographic coding to recognize words [21].

2.2.1. Phonological Decoding Strategy

Rumsey, et al. [22] define phonological decoding (PD) as the process of memorizing and retrieving information using the speech code that involves pronouncing a new sequence of letters following common grapheme-phoneme relationships. Stanovich and Share [23] posit that the PD strategy is crucial for the early stages of reading acquisition. When students read, they convert printed words into sounds and activate their meaning in the mental lexicon regardless of their orthographies [24]. Understanding the typical relationships between letters and sounds is beneficial when explicitly taught during the initial phases of EFL reading development. Students can improve their knowledge of new words by practicing and encountering them in various contexts. As a result, they gain confidence and efficiency in the mapping methods. The ability to recognize a word greatly depends on the quality of one's phonological representations or familiarity with its pronunciation [25].

The silent non-word reading (SNR) test is used to evaluate the ability of EFL and ESL students to accurately recognize and pronounce letters in a given orthography even when the word is non-sensical. This test helps to assess students' phonological representations by observing their ability to apply mapping rules of graphemes and phonemes. Therefore, a mutual relationship exists between grapheme and phoneme mapping and vocabulary.

According to Lee [26] students with a more extensive vocabulary consistently performed better in the phonological decoding strategy tests than those with smaller ones. In adult students, there is a relationship between their ability to represent phonological sounds and their comprehension skills when reading passages [27]. Therefore, PD is essential for reading not just at the vocabulary level but also in understanding the text.

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2.2.2. Orthographic Coding Strategy

Readers can access words in their mental dictionary using the orthographic coding (OC) strategy [28, 29]. Linguistically, Rumsey, et al. [22] define OC as a visual coding skills that relies on the analysis of linguistic patterns. This includes being able to recognize letter-sound relationships, understand sequential dependencies, identify structural redundancies and take into account the frequency of letter positions. Psychologists study how people recognize written words and how word recognition strategies are used. According to Coltheart [30] recognizing a word involves finding a familiar written word in an individual's mental lexicon. Consequently, when someone sees a specific regular word like 'riddle', they can quickly read it because their mental lexicon represents how it is pronounced. It follows the letter-sound correspondence rules in English.

It is important to note that not all combinations of letters and sounds in English have consistent patterns. For instance, a person can quickly make sense of the letter combination 'Biddle' as an inaccurate word despite it not being in their mental lexicon. In such a case, the strategy used to access word meanings from a written text without phonological representation is the OC [31]. After analyzing the mental lexicon, it indicates that this word does not have a corresponding item in that lexicon. Therefore, there is no need to check that item in the mental lexicon as explained by Coltheart, et al. [20]. According to the scholarly work of Gayán and Olson [32] the concept of OC is word-specific knowledge that cannot be obtained through the sub-lexical PD processes alone. This suggests that a mere association with oral vocabulary is insufficient to acquire a comprehensive understanding of the OC.

Coltheart [30] suggests a test to assess the use of the OC strategy by having individuals identify a word from two phonetically similar letter strings (e.g., rain/rane). The participants based their responses on their understanding of the specific spelling patterns of that target word. Hence, for successful reading in English, OC is crucial particularly for unfamiliar words as it demands having a good grasp of the letter-sound correspondence. According to the dual-route model, phonetic decoding and orthographic coding strategies operate simultaneously, transitioning from decoding phonetics to directly connecting spelling with meaning during the reading acquisition process [17].

2.3. Critical Components for Effective Word Recognition in an EFL Context

Learners studying English as a foreign language are sometimes known as "extraordinary word recognizers" because once they read, they visually focus on nearly all (around 80%) of the content words and approximately 50% of the small function words" [33]. Therefore, word recognition is regarded as "the most recurring cognitive activity" to read in any language as Perfetti [34] mentions. According to Shankweiler and Fowler [35] in any language, a writing system represents its spoken language. However, diverse writing systems can affect decoding, comprehension, word recognition and language proficiency Han [10]. Koda [36] argues that most of the difficulties EFL students experience in writing are related to word recognition which has received little attention despite its significance. Furthermore, Koda [37] outlines several critical factors necessary for successful word recognition in the EFL context including the impact of input, EFL experience (such as foreign language proficiency and foreign language input experience) and the interplay between these elements.

A lot of attention has been given to foreign language input. According to Yamashita [38] two factors are essential for foreign language input: orthographic regularity (for instance, the consistency by which the word's pronunciation matches its orthography) and how often that word is used. English as an alphabetic language requires knowing letter-sound combination rules to read well [24, 39]. These rules help learners accurately predict how to pronounce any word [40]. Students can efficiently build their vocabulary by linking a word's spelling, pronunciation and meaning in their memory through exposure in various contexts [41].

Many scholars including Akamatsu [42], Muljani, et al. [43], Shiotsu [44] and Yamashita [38] have conducted many studies to examine the impact of input properties on acquiring English as an FL and SL. Results have shown that EFL students performed significantly better on regular words than

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irregularly spelled ones irrespective of their L1 backgrounds. Muljani, et al. [43] found that Chinese students studying English respond more quickly to the most frequent English words than less frequent ones. Han [45] says second language acquisition can impact word recognition skills. For instance, readers less proficient in their second language have slower word recognition skills than their mother language [37, 43]. However, research has demonstrated that exposure to FL print and reading experiences can lead to automaticity in WR, decreasing recognition error rates and reading speed rates among EFL readers [10].

2.4. The Concept of Vocabulary Proficiency

Numerous scholars have established diverse criteria for defining vocabulary proficiency (VP) in the research of vocabulary acquisition [46-48]. For instance, Richards [49] perspective indicates that students achieved L2 vocabulary proficiency when they comprehended eight-word components: "frequency, register, syntax, derivation, association, semantic features and polysemy". This framework is prevalent due to its recognition of the complex and multifaceted nature of word knowledge.

However, Laufer and Paribakht [50] suggest that vocabulary knowledge is divided into several levels ranging from word recognition to the capacity to employ words appropriately during free production. According to Read [51] there are two distinct dimensions that determine an individual's VP: the breadth and depth of vocabulary knowledge. The term' breadth of vocabulary knowledge' describes the words an individual knows and is frequently used to assess their vocabulary size Qian [48]. Hazenberg and Hulstun [52] and Schmitt [53] explore this dimension. The quality of a person's word knowledge is closely linked to the depth of their vocabulary as stated by Read [54]. Researchers examine various word relations such as synonymy, antonymy and collocational restrictions to assess an individual's vocabulary depth[55]. This dimension has been explored in studies conducted by Greidanus and Nienhuis [56], Nassaji [57] and Webb [58].

According to recent studies on lexical proficiency, VP is defined by Nation [59] as the ability of a student to comprehend and produce words. Receptive size and productive size tests can be used to measure this ability. In his scholarly article titled "Teaching and Learning Vocabulary" published in 2005, Nation provides a detailed explanation of the fundamental aspects of VP as shown in Table 1. These are categorized into "three essential components: form, meaning and use. 'Form' refers to a word's spelling, sound and parts. Meaning involves recognizing a word's form-meaning relations understanding what it refers to and identifying related words with similar meanings" (p.584). Finally, knowledge of a word's use includes understanding its grammar such as its part of speech, collocations, formality, usage and any restrictions on its use.

Table 1.
What does it mean to know a word?

Forms	Spoken	R	What does the word sound like?
		P	How is the word pronounced?
	Written	R	What does the word look like?
		P	How is the word written and spelt?
	Word parts	R	What parts are recognizable in this word?
		P	What word parts are needed to express the meaning?
Meaning	Forms and meanings	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	Concepts and referents	R	What is included in the concept?
		P	What items can the concept refer to?
	Associations	R	What other words does this make us think of?

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		P	What other words could we use instead of this one?
Use	Grammatical functions	R	In what patterns does the word occur?
		P	In what patterns must we use this word?
	Collocation	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this one?
	Constraints on use (Register, frequency, etc.)	R	Where, when and how often would we expect to meet this word?
		P	Where, when and how often can we use this word?

Note: R= Receptive vocabulary knowledge, P= Productive vocabulary knowledge.
Source: Nation [60].

Students must comprehensively understand the form, meaning and use of words as the Nation's framework indicates to learn vocabulary effectively. According to some scholars [61-63] receptive vocabulary knowledge is developed before productive knowledge. Productive knowledge is typically only the size of the receptive vocabulary [64]. According to Salih and Riyadh [8]. Kamil [65] suggests that non-native English speakers must have a good grasp of vocabulary to complete academic tasks at the university level. According to Schmitt [66], university non-native learners need to know at least 2,000 of the most commonly used words to comprehend and 95% of essential spoken tasks to be prepared for advanced courses [66]. Failing to achieve this level, they may struggle to understand the language [67]. However, Schmitt and Schmitt [68] suggest that students should focus on mastering the 3,000 most regularly used English items. Read [51] suggests that English speakers at the college level possess a receptive vocabulary between of 13,200 and 20,7000 base words. Thus, it can be assumed that university-level (EFL) students require a vocabulary of approximately 17,000 words.

2.5. The Influence of Word Recognition Strategies on Vocabulary Proficiency

Recent advancements have shown a strong relationship between word recognition and the intentional and unintentional acquisition of vocabulary [38, 69]. When learning new words intentionally, students break down the sounds of words which is essential for effectively learning and retaining new items [70]. Quickly converting written symbols into corresponding sounds can help integrate newly acquired information such as the pronunciation and spelling of new words into memory [10]. Swift and effortless word recognition is essential for incidental vocabulary learning. The reader can use their working memory to perform other tasks such as observing, figuring out and incorporating new words into their existing vocabulary since it allows the working memory [70, 71]. However, Han [45] has shown that Chinese students studying English struggle with incidental vocabulary learning due to inefficient lexical access. This contradictory finding emphasizes the need for more studies to ascertain the relationship between WR and VP particularly considering the limited number of studies.

3. Methodology

3.1. Research Design

When conducting research, choosing the right design is one of the critical decisions that need to be made. The descriptive-quantitative correlational design is a research method that is particularly useful for gathering, classifying and analyzing data about current practices, beliefs and conditions and then interpreting the data accurately and adequately, using or without the help of statistical methods. It is also a sort of research in which data is collected to determine the degree to which a relationship exists among the study variables [72, 73]. In addition, the present studies used a correlational design to measure and describe the relationship between dependent and independent variables and reveal their differences.

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3.2. Sample of the Study

The respondents of the current research consist of 400 fourth-year college students chosen randomly from three Iraqi universities: Baghdad, Diyala and Basrah as shown in Table 2.

Table 2
The study sample.

Name of the university	Sample
Baghdad	100
Diyala	143
Basrah	157
Total	400

3.3. Research Instruments

3.3.1. Word Recognition Strategies Instrument

The researcher has adopted the orthographic Word Pseudo omophone Choice (WPC) and the phonological Silent Non-Word Reading Test (SNR) from Olson, et al. [74] to assess the WRS of Iraqi EFL university students. The WPC test measures students' employ of the orthographic strategy. This test consists of 80 words. The initial 40 pairs contain monosyllabic items and the final 40 pairs include less frequent multisyllabic words. Furthermore, both pairs sound the same but only one forms a word while the second represents a non-word "pseudo homophone" (e.g., take-taik). The sample must remember a given word's orthographic pattern to answer the questions (see Appendix A).

The SNR test is designed to evaluate students' employment of phonological strategy according to Olson, et al. [74]. It includes sixty pronounceable letter strings that increase in difficulty. The test presents three non-words, for instance (phinny, hanny and munny) together with only one sounding like a familiar one (in this case, munny) (see Appendix B). The test requires students to identify the item that sounds familiar. The students' responses in both tests are scored dichotomously meaning they are either marked as correct or incorrect. Each correct response earns one point while incorrect responses receive zero points. However, the total score for the SNR test is 60 while the total for the WPC is 80.

3.3.2. Vocabulary Proficiency Instrument

The researcher has adopted two tests to assess the university students' level of VP. The first test, the Vocabulary Size Test (VST) (Version 20,000) developed by Nation and Beglar [75] is used to measure the students' written receptive vocabulary size in English. In this test, 100 multiple-choice questions focused on form-meaning links without testing productive ability. In 2006, Nation created a frequency list of 20 bands of 1,000 words each. Five items from the 1,000-word and 2,000-word frequent groups were chosen for the participants to test their understanding of their meanings. They were asked to select the correct answer for each question and one point was awarded for every correct response with a maximum score of 100 points. To calculate the total size of a participant, the final score must be multiplied by 200. Therefore, if students score 35 out of 100, their total size would be 7,000-word families.

The second one, the Productive Vocabulary Levels Test (PVLT) version 2 measures students' productive vocabulary knowledge. It was adopted by Laufer and Nation [76]. The test includes 18 lexical items from the 2,000, 3,000, 5,000 and 10,000-word and academic vocabulary levels. Participants can score between zero and 18 in each section with one point awarded for each correct item and no points for incorrect or unanswered items. The highest score that a student can achieve on the test is 90 points. The evaluated level determines if a participant has properly achieved a certain level and is a subjective judgment. However, for the 2,000-word level, if a student scores around 15 or 16 out of 18 (85%-90%), it may not be easy to effectively communicate a message using less than 150 words.

During the academic year 2021-2022, the study instruments are given to the study participants at separate times after ensuring their psychometric features. Ethical approval was sought before data

gathering to ensure the privacy of the respondents. During the study, their real names were kept anonymous and all the data collected was kept almost confidential and used solely for the current study.

3.3.3 Methods of Data Analysis

The Statistical Package for Social Sciences (SPSS) version 19 was used to conduct the statistical analyses. The gathered data were tabulated and summarised through Microsoft Excel. The T-test for one sample, the standard deviation and the mean were calculated. The level of significance was set at $p< 0.05$.

4. Results

4.1. Results Related to the First Aim

Table 3 presents the measurement results for VP levels and WRS use among Iraqi EFL college students. A t-test has been implemented to compare the calculated arithmetic means to the theoretical means. The collected data indicates that the participants employ orthographic and phonological strategies as evidenced by the mean scores of the orthographic and phonological strategies (63.6887 and 40.710, respectively). The calculated t-values (56.296-29.017) were found to be higher than the critical value (1.96) (see Table 3).

Table 3.
The mean and t-values for the word recognition strategy tests.

Variables	No.	Means	Std.	Hypothetical means	T-test values		Level of significance (0.05)	Degree of freedom
					Computed	Critical		
WPC	400	63.877	8.886	40	56.295	1.96	Significant	399
SNR		40.610	7.373	30	29.017			

As for students' level of VP, the participant's results from the test show that university students in Iraq have an average level of VP since the mean score is found to be 118.552 and the standard deviation is . 17.890 with a hypothetical mean of 95. The calculated value of 26.319 is higher than the critical value of 1.96. Therefore, it can be concluded that the research sample has an average level of vocabulary proficiency. The results are shown in Table 4.

The results presented in Table 4 also show that the mean of the participants' scores in the receptive and productive vocabulary tests are (67.550- 50.992) respectively. The theoretical means are 50-40 respectively. The calculated t-values are 37.655-12.920 respectively which are higher than the critical value (1.96). Thus, this indicates that the sample possesses a good receptive and productive vocabulary size as shown in Table 4.

Table 4.
The arithmetic mean, standard deviation, and t-values of VP.

Variables	No.	Means	Standard deviations	Hypothetical means	T- value		Level of significance 0.05
					Computed	Critical	
VST	400	67.550	9.322	50	37.655	1.96	Significant
PVLT		50.992	9.275	45	12.920		
VP		118.552	17.890	95	26.319		

More analysis of the results has been carried out to determine the percentages of the sample's answers at each word-frequency level. The mean score decreases from 11.671 at the 2000-word level to 8.798 at the 10,000-word level. These findings imply that the percentages of the sample productive size also decreased from 65 % at the 2000 level to 49% at the 10000 level as presented in Table 5.

Table 5.
Means and percentages of participants' answers at each level of PVLT.

Level	Mean	N	Percentage
2000	11.670	400	65%
3000	10.925		61%
5000	10.120		56%
UWL	9.480		53%
10000	8.797		49%

4.2. Results Related to the Second Aim

The Pearson correlation coefficient and t-test are also used to identify the correlational relationship between WRS and VP among Iraqi college students studying English as a foreign language. Table 6 shows that the correlation coefficients between the orthographic strategies test and VST, PVLT and VP are 0.559, 0.585 and 0.595, respectively (see Table 6).

Table 6.
The computed coefficients for WRS and VP.

Variables	VP	N	Correlation coefficients	T-test value		Level of significance (0.05)
				Computed	Critical	
Orthographic strategy	VST	400	0.559	12.422	1.96	Significant
	PVLT		0.585	13.00		
	VP		0.595	12.222		
Phonological strategy	VST		0.579	12.884		Significant
	PVLT		0.582	12.955		
	VP		0.604	13.422		

Furthermore, it is evident from Table 6 that there is a positive relationship between the SNR test and both VST and PVLT with correlation coefficients of 0.579 and 0.582 respectively. The calculated t-values are 12.844 and 12.955 respectively higher than the critical value. This implies that their receptive and productive vocabulary size will improve when the study participants employ the phonological strategy for identifying English vocabulary.

Overall, the results show a statistical relationship between WRS and VP. This is supported by the calculated t-values of the VST and PVLT (13.222, 13.422) which are higher than the critical ones. This means that whenever students' usage of orthographic coding and phonologic decoding strategies to recognize English words increases, their VP also develops.

5. Discussion

The study shows that Iraqi EFL university students have a significant ability to process written words using the orthographic strategy with a direct positive relationship between participants' word recognition strategies and vocabulary proficiency. The researcher attributes these good cognitive processing abilities observed in the sample's performance to the fact that they come equipped with knowledge that allows them to transfer letters to sounds quickly. As a result, they read non-words without hesitation and are more skilled at employing the grapheme-phoneme correspondence rules. These results are consistent with those of Sieh [25] who found that proficient readers use WRS more effectively. The results shown in Table 6 demonstrate that there is a positive correlation between the Iraqi college students' WRS and VP test means. A possible explanation for this result is that Iraqi students know more vocabulary receptively than they do productively. Words that are used more frequently are likely to be known receptively and productively whereas less frequently used ones are either unknown or not used productively so often. These findings are likely related to those of Hajilou,

et al. [77] and Edgarsson [78] who found that students' receptive vocabulary size is always greater than their productive.

6. Conclusion

According to the study results, word recognition strategies have influenced the vocabulary proficiency levels of Iraqi EFL university students. A successful use of memory can lead to increased self-confidence and mental control as demonstrated by students' ability to make correct decisions and accurately comprehend the meanings of words.

Iraqi EFL college students need to understand the most frequent English words well. Based on the PVLT findings, they seem to have a satisfactory grasp of words at the 2000 and 3000 levels and the 5000 and academic word levels. However, they need to improve their knowledge of words at the 10,000 levels. As expected, they are more familiar with words used frequently and less familiar with those used less often. The frequency levels of the productive size test are scalable which means that once a student has mastered one level, they can be supposed to have reached the mastery standard at higher frequency levels as well [79].

Additionally, investigating the relationship between WRS and VP could encourage students to develop better word identification strategies. When students improve their decoding abilities, they become more proficient in recognizing English words and can use their vocabulary knowledge to enhance their comprehension skills [80].

Iraqi EFL university students who reach a good vocabulary size at the 10,000-word level tend to use a limited number of low-frequency words productively because precise word use at the academic level is more challenging than general vocabulary, as it is more frequently used.

7. Recommendation

It is recommended that teachers shift their focus from teaching particular high-frequency words to teaching strategies for learning low-frequency ones [81]. It is also suggested to design and include more activities that emphasize students' lower-processing decoding skills. After their decoding skills are consolidated, the students become more skilled in word recognition before using their vocabulary knowledge to support comprehension [80].

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Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Competing Interests:

The authors declare that they have no competing interests.

Authors' Contributions:

All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

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Supplementary Materials:

Appendix A: Word-Pseudo homophone Choice Test: This appendix includes questions to assess the Orthographic decoding strategy.

Appendix B: Silent Nonword Reading Test: This appendix includes questions to assess the phonological coding strategy.

Appendix A

Orthographic Word-Pseudohomophone Choice (WPC)Test.

Instructions: in this test, two items at a time are presented. Both of these would sound like a real word, but only one is a real word. Tick in a small circle beside the item that would sound like a real word. Try to answer with few errors as possible.

1	◯ Take	◯ Taik	21	◯ Hevvy	◯ Heavy
2	◯ Wurd	◯ Word	22	◯ Hoal	◯ Hole
3	◯ Gote	◯ Goat	23	◯ Hert	◯ Hurt
4	◯ Coat	◯ Cote	24	◯ Keep	◯ Keap
5	◯ Pleese	◯ Please	25	◯ Lake	◯ Laik
6	◯ Rain	◯ Rane	26	◯ Lurn	◯ Learn
7	◯ Sleap	◯ Sleep	27	◯ Need	◯ Nead
8	◯ Store	◯ Stoar	28	◯ Nice	◯ Nise
9	◯ Streat	◯ Street	29	◯ Roar	◯ Rore
10	◯ Wagon	◯ Wagun	30	◯ Scare	◯ Scair
11	◯ Anser	◯ Answer	31	◯ Sheep	◯ Sheap
12	◯ Believe	◯ Beleave	32	◯ Skait	◯ Skate
13	◯ Between	◯ Betwean	33	◯ Smoke	◯ Smoak
14	◯ Choose	◯ Chooze	34	◯ Streem	◯ Stream
15	◯ Deap	◯ Deep	35	◯ Taip	◯ Tape

16	◯ Dreem	◯ Dream	36	◯ Thum	◯ Thumb
17	◯ Easy	◯ Eazy	37	◯ Toward	◯ Toard
18	◯ Evry	◯ Every	38	◯ True	◯ Trew
19	◯ Face	◯ Fase	39	◯ Wait	◯ Wate
20	◯ Fue	◯ Few	40	◯ Wize	◯ Wise
41	◯ Sammon	◯ Salmon	61	◯ Captain	◯ Captin
42	◯ Nostrels	◯ Nostrils	62	◯ Engine	◯ Enjine
43	◯ Fought	◯ Faught	63	◯ Mysterey	◯ Mystery
44	◯ Ghost	◯ Goast	64	◯ Exsample	◯ Example
45	◯ Grone	◯ Grown	65	◯ Several	◯ Sevral
46	◯ Perched	◯ Purched	66	◯ Distence	◯ Distance
47	◯ Wheet	◯ Wheat	67	◯ Sudden	◯ Suddin
48	◯ Mussle	◯ Muscle	68	◯ Importent	◯ Important
49	◯ Trousers	◯ Trowsers	69	◯ Backwords	◯ Backwards
50	◯ Alternitive	◯ Alternative	70	◯ Explane	◯ Explain
51	◯ Condence	◯ Condense	71	◯ Senaters	◯ Senators
52	◯ Compliment	◯ Complimant	72	◯ Interesting	◯ Intresting
53	◯ Dignaty	◯ Dignity	73	◯ Demon	◯ Deamon
54	◯ Pavement	◯ Pavemant	74	◯ Harth	◯ Hearth
55	◯ Nusance	◯ Nuisance	75	◯ Wreath	◯ Reath
56	◯ Resource	◯ Resourse	76	◯ Applause	◯ Aplause
57	◯ Travle	◯ Travel	77	◯ Salad	◯ Sallad

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58	◯ Study	◯ Studdy		78	◯ Sensitive	◯ Sensative
59	◯ Baisment	◯ Basement		79	◯ Liberty	◯ Libberty
60	◯ Assure	◯ Ashure		80	◯ Culpret	◯ Culprit

Appendix B
Phonological Silent Nonword Reading (SNR) Test.

Instructions: Three nonsense words at a time are presented. None of these are real words. However, one of them would sound like a real word if you sounded it in your head. You will show what would sound like a real word by ticking in a small circle beside the right choice. Try to answer but accurately as you can.

1	◯ Gan	◯ Pab	◯ Kat
2	◯ Poal	◯ Hoil	◯ Mool
3	◯ Pye	◯ Dee	◯ Lue
4	◯ Kape	◯ Dape	◯ Lape
5	◯ Pid	◯ Lud	◯ Sed
6	◯ Breen	◯ Bloan	◯ Clain
7	◯ Gass	◯ Hask	◯ Wask
8	◯ Crish	◯ Wosh	◯ Hesh
9	◯ Coam	◯ Baim	◯ Goam
10	◯ Suv	◯ Wiv	◯ Hav
11	◯ Fard	◯ Werd	◯ Lurd
12	◯ Fude	◯ Wode	◯ Gade
13	◯ Dion	◯ Stoon	◯ Boan
14	◯ Sharf	◯ Slout	◯ Skore
15	◯ Slin	◯ Scip	◯ Shill
16	◯ Coff	◯ Thriff	◯ Pluff

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17	◯ Gizz	◯ Duzz	◯ Tazz
18	◯ Grait	◯ Throut	◯ Bloot
19	◯ Citch	◯ Potch	◯ Tutch
20	◯ Poost	◯ Moast	◯ Froust
21	◯ Chooze	◯ Goote	◯ Mooze
22	◯ Caim	◯ Goim	◯ Neem
23	◯ Blad	◯ Stid	◯ Flud
24	◯ Chande	◯ Danse	◯ Lanze
25	◯ Stune	◯ Pline	◯ Trane
26	◯ Lite	◯ Fote	◯ Nate
27	◯ Cleen	◯ Bain	◯ Vown
28	◯ Horge	◯ Horce	◯ Horve
29	◯ Droom	◯ Creem	◯ Staim
30	◯ Skiat	◯ Plout	◯ Steet
31	◯ Fleek	◯ Brouk	◯ Shaik
32	◯ Shoop	◯ Crawp	◯ Sleap
33	◯ Pellar	◯ Senter	◯ Nertain
34	◯ Bace	◯ Caze	◯ Vage
35	◯ Strook	◯ Squaik	◯ Speek
36	◯ Sach	◯ Trax	◯ Stam
37	◯ Dysical	◯ Fotograph	◯ Barmacy
38	◯ Teer	◯ Gair	◯ Cour
39	◯ Cree	◯ Spoo	◯ Flie

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40	◯ Roke	◯ Noze	◯ Clobe
41	◯ Sirst	◯ Kirch	◯ Bight
42	◯ Cloor	◯ Fleer	◯ Scair
43	◯ Dircus	◯ Migar	◯ Sircle
44	◯ Phan	◯ Shog	◯ Chun
45	◯ Stee	◯ Floo	◯ Blai
46	◯ Firch	◯ Sirst	◯ Sicks
47	◯ Nule	◯ Rale	◯ Jile
48	◯ Shurt	◯ Skart	◯ Dort
49	◯ Tooch	◯ Reech	◯ Paich
50	◯ Fout	◯ Lait	◯ Doot
51	◯ Fone	◯ Phote	◯ Toaf
52	◯ Smeak	◯ Joak	◯ Paik
53	◯ Phinny	◯ Hanny	◯ Munny
54	◯ Flate	◯ Gite	◯ Bote
55	◯ Sentury	◯ Bertainly	◯ Mertify
56	◯ Naim	◯ Soom	◯ Coim
57	◯ Peneral	◯ Pentle	◯ Jenerous
58	◯ Skwash	◯ Shreeze	◯ Skard
59	◯ Smowl	◯ Tawl	◯ Beel
60	◯ Reaton	◯ Treapon	◯ Seazon

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