Diglossia and Early Bilingualism: Word- Meaning Recognition Strategies in Libyan Arabic -English Preschoolers

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Abstract

This study investigates how Libyan Arabic-speaking preschool children recognize written English words and associate them with their meanings within a diglossic linguistic environment. Twenty-four children aged five to six years completed two experimental tasks designed to measure word-form recognition and meaning identification. In the first task, participants were asked to indicate whether they recognized written English words presented on flashcards. In the second task, they selected the picture corresponding to the meaning of each word from four possible options. Quantitative analysis revealed that children recognized written word forms more accurately than they identified their meanings. A two-way analysis of variance (ANOVA) showed a significant effect of task type, indicating higher performance in word recognition than in meaning identification, as well as a significant age effect, with six-year-old children outperforming five-year-olds. Qualitative observations further indicated that children relied on strategies such as attention to visual features of words, phonological rehearsal, and semantic approximation when interpreting unfamiliar items. The findings suggest that visual familiarity with written forms may develop before stable semantic mapping during early second-language literacy acquisition. The study contributes to understanding how young learners in Arabic diglossic contexts begin to process written English and highlights the interaction between linguistic environment and early bilingual literacy development.
Keywords: Diglossia, Early bilingualism, Word recognition, Vocabulary acquisition, Early literacy

1. Introduction

Early childhood language development increasingly occurs in linguistically complex environments where children encounter multiple languages or language varieties during the formative stages of cognitive development. In many regions of the world, bilingualism emerges naturally through social interaction and educational exposure rather than through deliberate language planning. Within the Arabic-speaking

world, however, bilingual language development often takes place within an additional sociolinguistic framework characterized by diglossia.

Diglossia refers to a linguistic situation in which two varieties of the same language coexist within a speech community while serving different communicative functions (Ferguson, 1959). In Arabic-speaking societies, children typically acquire a local vernacular dialect as their primary spoken language while encountering Modern Standard Arabic primarily in written texts, formal communication, and educational contexts. Consequently, early literacy development often involves learning to read in a linguistic variety that differs from the language used in everyday interaction. This linguistic distinction has important implications for early reading acquisition. Several studies have shown that the phonological and lexical differences between spoken Arabic dialects and Modern Standard Arabic may influence the development of phonological awareness and reading fluency among young learners (Saiegh-Haddad, 2020). When English is introduced as an additional language during early education, children must therefore navigate three linguistic systems simultaneously: the spoken dialect, the formal written variety of Arabic, and the orthographic and phonological system of English.

Research on early literacy development suggests that children often acquire the ability to recognize written word forms before they develop stable associations between orthography and meaning (Ehri, 2020). During the early stages of reading development, learners may rely on visual recognition of letter patterns, phonological approximation, or contextual cues rather than complete lexical knowledge when identifying written words. These strategies may become particularly important in bilingual learning contexts where children are simultaneously developing literacy skills in more than one language. Although bilingual literacy development has received increasing scholarly attention, relatively little research has examined early English word recognition among preschool children growing up in Arabic diglossic environments. Understanding how Libyan preschool children interpret written English words may therefore provide valuable insight into how linguistic experience shapes early literacy processes.

The present study investigates how Libyan Arabic–English preschool children recognize written English words and associate them with their meanings. By combining quantitative performance measures with qualitative observations of children's responses, the study aims to contribute to current research on early bilingual literacy development in diglossic contexts. Despite the growing body of research on bilingual literacy development, relatively little empirical work has examined how preschool children in Arabic diglossic contexts begin to process written English words during the earliest stages of learning. Previous studies have primarily focused on phonological awareness and reading development in Arabic itself, particularly the relationship between spoken dialects and Modern Standard Arabic. However, far fewer studies have investigated how children exposed to Arabic diglossia approach literacy in an additional language such as English. In particular, limited attention has been

given to how young learners distinguish between recognizing written word forms and understanding their meanings when exposure to English is still developing. Investigating these processes among Libyan preschool learners therefore contributes to a clearer understanding of how diglossia and early foreign-language exposure interact during the initial stages of bilingual literacy development.

2.Aims of the Study

This study aims to examine how Libyan Arabic-English preschool children process written English words during the early stages of second-language literacy development. Specifically, the study investigates children's ability to recognize English word forms and associate them with their meanings, while also exploring the strategies they employ when interpreting unfamiliar written words.

3.Research Questions

The study addresses the following research questions:

1. To what extent can Libyan Arabic–English preschool children recognize written English word forms and identify their meanings?
2. Are there significant age-related differences between five- and six-year-old children in their performance on word recognition and meaning identification tasks?
3. What cognitive strategies do preschool children employ when interpreting unfamiliar written English words?

4. Literature Review

Early literacy development involves the gradual integration of orthographic knowledge, phonological awareness, and semantic understanding. According to Ehri's theory of orthographic mapping, children learn to store written words in memory by forming connections between letter sequences, their corresponding sounds, and their meanings. Through repeated exposure to printed words, learners gradually develop automatic recognition of familiar orthographic patterns, allowing them to retrieve words from memory without conscious decoding (Ehri, 2020).

Research on emergent literacy suggests that the foundations of reading development begin well before formal instruction. Young children are often exposed to environmental print, picture books, and storytelling activities that support early recognition of written symbols and foster awareness of the relationship between written language and meaning (Lonigan, Burgess, & Schatschneider, 2020). These early experiences may allow children to recognize familiar word forms even when their understanding of the associated meanings remains incomplete. Bilingual learners may approach literacy development with additional cognitive resources. Studies have suggested that bilingual children often demonstrate heightened metalinguistic awareness, which may facilitate aspects of reading acquisition such as phonological processing and word recognition (Bialystok, 2017). At the same time, bilingual learners

must coordinate multiple phonological and orthographic systems while constructing lexical representations across languages.

Recent research in second language literacy indicates that young learners frequently rely on compensatory strategies when encountering unfamiliar written words. These strategies may include phonological approximation, contextual inference, or visual recognition of orthographic patterns (Koda & Zehler, 2023). Such strategies reflect the developing nature of lexical representations during early language learning. The Arabic linguistic context introduces an additional layer of complexity through diglossia. Saiegh-Haddad (2020) argues that the linguistic distance between spoken Arabic dialects and Modern Standard Arabic may influence children's reading development because the phonological structures encountered in written language often differ from those used in everyday speech. Consequently, Arabic-speaking children must develop the ability to process written forms that are only partially aligned with their spoken linguistic knowledge.

When English is introduced as a foreign language in early education, young Arabic-speaking learners encounter an entirely new orthographic system. Studies examining early English learning among Arabic-speaking children suggest that visual cues and contextual support play an important role in facilitating early vocabulary acquisition (Ibrahim & Aharon-Peretz, 2023). Because young learners often have limited lexical knowledge in the second language, they frequently rely on visual representations or semantic associations when interpreting written words. Despite growing research on bilingual literacy, empirical studies examining how preschool children in North African contexts approach written English remain limited. Investigating early word recognition strategies among Libyan preschool learners may therefore contribute to a better understanding of how diglossia and bilingual exposure interact during early literacy development.

5. Methodology

The study adopted a mixed-methods design combining quantitative analysis of task performance with qualitative observation of children's responses. Mixed-methods approaches are widely used in applied linguistics because they allow researchers to examine both measurable outcomes and the cognitive processes underlying learner behavior (Creswell & Plano Clark, 2018). In studies involving young children, qualitative observation is particularly valuable because children's verbal comments and behavioral responses often reveal the strategies they employ when performing linguistic tasks.

The participants were twenty-four preschool children enrolled in a private kindergarten in Tripoli, Libya. The sample consisted of twelve five-year-old children and twelve six-year-old children. All participants were native speakers of Libyan Arabic and had been exposed to English through classroom activities including songs, vocabulary games, and picture-based learning materials. English instruction in the

kindergarten typically involved approximately three to four short sessions per week focusing on basic vocabulary and simple expressions. None of the children had received formal reading instruction in English prior to the study. Participants were recruited with the assistance of the kindergarten administration. Parents were informed about the purpose of the study and provided written consent for their children's participation. In order to ensure that the results reflected language learning rather than developmental difficulties, children with known hearing impairments or diagnosed language disorders were not included in the study. Such screening procedures are commonly recommended in early language research to ensure the reliability of experimental findings (Mackey & Gass, 2022).

The experimental stimuli consisted of twenty English words representing common vocabulary typically introduced in early childhood English learning materials. The words were selected from beginner-level preschool textbooks and classroom resources commonly used in Libyan kindergartens. The items represented concrete semantic categories such as animals, food, household objects, and natural elements. Concrete nouns were intentionally selected because early vocabulary acquisition research indicates that such words are generally acquired earlier by young learners due to their perceptual salience and the possibility of linking them to visual representations (Nation, 2013). Using familiar conceptual categories also increased the likelihood that children would be able to associate the written words with recognizable images during the experimental tasks.

Table 1 presents the stimulus words used in the study.

Category	Words
Animals	cat, dog, fish, bird
Food	apple, milk, bread
Objects	ball, book, car, chair
Nature	sun, tree, flower
Daily items	bag, hat, shoe, cup, table

Each word was printed on a flashcard using large clear lettering. For the meaning identification task, each word was accompanied by four images representing possible meanings. Only one image corresponded to the correct meaning, while the remaining images served as distractors. Data collection took place in a quiet room within the kindergarten to minimize distractions. Each child participated individually in a session lasting approximately fifteen minutes. The procedure consisted of two tasks administered sequentially.

In the first task, children were shown flashcards displaying English words and were asked whether they recognized the word. If the child attempted to read or pronounce the word or indicated familiarity with it, the response was recorded as recognition. This task was designed to measure children's ability to identify written word forms. While in the second task, children were shown the same written word accompanied by four pictures and were asked to select the image corresponding to the meaning of the word.

This task measured the child's ability to associate orthographic forms with semantic representations.

Each correct response received one point. Maximum scores were therefore twenty points for the word recognition task and twenty points for the meaning identification task. Accuracy scores were calculated for each participant and analyzed statistically.

6. Results

The results section presents both quantitative and qualitative analyses of children's performance in the experimental tasks. The quantitative analysis examines accuracy scores obtained from the word recognition and meaning identification tasks in order to determine patterns of performance across age groups and task types. Quantitative analysis is commonly employed in language acquisition research to identify measurable patterns in learner performance and to evaluate developmental differences across groups (Mackey & Gass, 2022). In the present study, descriptive statistics and inferential statistical procedures were used to examine differences in children's ability to recognize written English words and associate them with their meanings. The qualitative analysis complements these findings by examining the reasoning strategies children employed while completing the tasks, allowing a deeper understanding of the cognitive processes underlying their responses.

6.1 Quantitative Results

The quantitative data were analysed using descriptive statistics and inferential statistical procedures in order to examine children's performance across the two experimental tasks. Descriptive statistics, including mean scores, standard deviations, and score ranges, were calculated to provide an overall representation of the distribution of participants' responses. The use of descriptive statistics is widely recommended in applied linguistics research because it allows researchers to summarize patterns in learner performance and evaluate variability across participants (Field, 2018). In addition, inferential statistical analysis was conducted to determine whether observed differences between age groups and task types were statistically significant. Statistical tests such as analysis of variance (ANOVA) are commonly used in developmental language research to examine whether performance differences reflect systematic developmental patterns rather than random variation (Larson-Hall, 2016).

The quantitative analysis therefore aimed to address two central questions: whether children demonstrated higher accuracy in recognizing written word forms than in identifying their meanings, and whether older preschool children performed significantly better than younger participants. Measures of variability, including standard deviation and score range, were also calculated to provide a more detailed understanding of individual differences in task performance. Following this

introductory analysis, the tables below present the descriptive statistics and comparative results for the two tasks.

Descriptive statistics for the two tasks are presented in Table 2.

Task	Mean	SD	Range
Word recognition	**14.4**	**2.9**	**9–19**
Meaning identification	**10.8**	**3.6**	**5–17**

Overall, children performed substantially better in recognizing written word forms than in identifying their meanings.
Age differences were also observed. Table 3 presents mean scores for each age group.

Age group	Recognition Mean	Meaning Mean
Five-year-olds	**12.5**	**9.1**
Six-year-olds	**16.2**	**12.5**

A two-way analysis of variance (ANOVA) was conducted to examine the effects of age group and task type on accuracy scores. The analysis revealed a significant main effect of task type, $F(1,22) = 18.47$, $p < .001$, indicating that children performed significantly better in the recognition task than in the meaning identification task. A significant main effect of age group was also observed, $F(1,22) = 10.36$, $p = .004$, demonstrating that six-year-old children achieved higher accuracy scores overall. The interaction between age group and task type approached significance, suggesting that the performance gap between recognition and meaning identification was somewhat larger among younger participants.

6.2 Qualitative Analysis

While the quantitative results provide important information about accuracy patterns, they do not fully capture the reasoning processes children employ when interpreting written words. For this reason, qualitative analysis was conducted to examine children's verbal responses and behavioral strategies during task performance. Qualitative approaches are particularly valuable in studies involving young learners because children often reveal their cognitive strategies through spontaneous verbalizations and observable behaviors (Mackey & Gass, 2022). By analysing these responses, researchers can gain insight into how learners process linguistic information even when their answers are incorrect.

The qualitative analysis in the present study focused on identifying recurring patterns in children's explanations and task behaviors. Following commonly used procedures in thematic analysis, children's responses were examined to identify recurring reasoning strategies (Braun & Clarke, 2006). Three major themes emerged

from this analysis: orthographic reasoning, phonological rehearsal, and semantic approximation.

Orthographic reasoning occurred when children attempted to interpret written words by referring to visual features of the letter patterns. Such responses suggest that learners were beginning to attend to orthographic structure when recognizing words, a process that has been described as an early stage in the development of orthographic knowledge (Ehri, 2020). Phonological rehearsal was observed when children repeated the written word aloud while attempting to determine its meaning. This behavior suggests that learners were attempting to activate phonological representations of the word in order to access stored vocabulary, a strategy frequently reported in early reading research (Koda & Zehler, 2023). Finally, semantic approximation occurred when children selected images that were conceptually related to the target word but not identical to it. Such responses indicate that learners were drawing on broader conceptual knowledge when precise lexical mapping was unavailable, a phenomenon commonly observed in early vocabulary acquisition (Nation, 2013).

Qualitative analysis of observational notes revealed several recurring interpretive strategies employed by participants during task performance. Thematic analysis was conducted following standard procedures for identifying patterns in qualitative data. Children's verbal responses were recorded during the tasks and later examined to identify recurring reasoning strategies. One prominent strategy involved orthographic reasoning, in which children attempted to interpret words based on visual features of the written form. For example, one six-year-old participant examining the word ball commented, "This one looks like ball because it has two tall letters." Although the explanation was not linguistically precise, it suggests that the child was attending to visual characteristics of the orthographic pattern. A second strategy involved phonological rehearsal. Several children repeated the written word aloud while attempting to identify the correct image. One five-year-old child was observed saying "car… car… car" repeatedly before selecting the picture of a car. This behavior suggests that the child was attempting to activate a phonological representation of the word in order to retrieve its meaning. A third recurring pattern involved semantic approximation. In some cases, children selected images that were conceptually related to the correct meaning but not identical. For instance, when presented with the word fish, one participant selected the image of a dolphin and explained, "It lives in the water." Such responses indicate that children were drawing upon partial conceptual knowledge when precise lexical mapping was unavailable. These qualitative observations provide insight into the cognitive strategies children employed when encountering unfamiliar written words.

To enhance the reliability of the qualitative analysis, the observational notes and children's verbal responses were reviewed independently by the two researchers. Emerging themes were compared and discussed until agreement was reached regarding the classification of the observed strategies. This procedure helped ensure that the identified categories accurately reflected recurring patterns in the children's responses.

7. Discussion

The purpose of the present study was to investigate how Libyan Arabic–English preschool children recognize written English words and associate them with meaning within a diglossic linguistic environment. By combining quantitative analysis of task performance with qualitative observations of children's reasoning strategies, the study sought to provide insight into the early stages of second-language word recognition and lexical development.

The first research question examined the extent to which preschool children were able to recognize English word forms. The quantitative results showed that participants achieved considerably higher accuracy in the word recognition task than in the meaning identification task. This pattern suggests that children were able to recognize visual word forms even when their understanding of the corresponding meanings was still developing. These findings are consistent with theoretical accounts of early literacy development which propose that orthographic familiarity often emerges before complete semantic mapping. According to Ehri's theory of orthographic mapping, children gradually form connections between written forms and their phonological representations through repeated exposure to printed words, allowing them to recognize visual patterns before fully establishing stable lexical meanings (Ehri, 2020). The higher performance observed in the recognition task therefore supports the view that early reading development involves a gradual progression from visual identification of written forms to deeper lexical processing.

The second research question concerned children's ability to associate written words with their meanings. Performance in the meaning identification task was noticeably lower than in the recognition task, indicating that establishing stable semantic associations posed a greater challenge for the participants. This finding aligns with research on early vocabulary acquisition which suggests that young language learners often develop partial lexical knowledge before achieving full semantic understanding (Nation, 2013). In the early stages of second-language learning, children may recognize a written or spoken word as familiar without being able to retrieve its precise meaning. Similar developmental patterns have been reported in studies of second-language literacy development, where learners gradually refine their lexical representations as they encounter words repeatedly in different contexts (Koda & Zehler, 2023). The present findings therefore reinforce the view that word recognition and semantic knowledge do not necessarily develop simultaneously during early language learning.

The third research question explored whether age-related differences existed between younger and older preschool learners. The statistical analysis revealed that six-year-old participants performed significantly better than five-year-olds across both tasks. This result suggests that even small differences in developmental stage and linguistic exposure may have a measurable impact on early literacy skills. Previous research has shown that cognitive maturation and increased language exposure contribute to improvements in phonological processing, vocabulary knowledge, and

reading-related skills during early childhood (Lonigan et al., 2020). In addition, studies of bilingual language development have suggested that older children often demonstrate greater metalinguistic awareness, which may enable them to analyze linguistic structures more effectively (Bialystok, 2017). The higher performance of the older participants in the present study may therefore reflect both developmental growth and increased familiarity with English vocabulary through classroom exposure.

The qualitative findings further illuminate the cognitive strategies children employed while interpreting written words. One recurring pattern involved orthographic reasoning, in which children attempted to interpret words based on visual features of the written form. This behavior suggests that learners were beginning to attend to letter patterns and orthographic structures when recognizing words. Such observations align with research on orthographic learning which indicates that young readers gradually develop sensitivity to visual letter sequences as they build a mental lexicon of written words (Ehri, 2020). The presence of orthographic reasoning among participants therefore supports the idea that children were beginning to develop early orthographic awareness even without formal reading instruction.

Another frequently observed strategy was phonological rehearsal. Several children repeated written words aloud while attempting to select the correct image. This behavior suggests that participants were attempting to activate phonological representations of the written words in order to retrieve their meanings. Phonological recoding has long been recognized as a central mechanism in early reading acquisition, as it allows learners to connect written forms with spoken language representations stored in memory (Koda & Zehler, 2023). The occurrence of phonological rehearsal in the present study therefore indicates that children were actively attempting to bridge the gap between orthographic input and their existing phonological knowledge.

A third pattern identified in the qualitative analysis was semantic approximation. In these cases, children selected images that were conceptually related to the target word but not identical to it. For example, selecting a dolphin in response to the word fish suggests that the child relied on broader conceptual knowledge rather than precise lexical mapping. Such responses reflect an early stage of vocabulary development in which learners interpret unfamiliar words by linking them to existing semantic categories (Nation, 2013). Semantic approximation therefore represents an adaptive strategy through which children attempt to infer meaning despite limited lexical knowledge.

The sociolinguistic context of Arabic diglossia may also play an important role in shaping how children approach written language. Arabic-speaking children grow up navigating two linguistic varieties: the spoken dialect used in daily interaction and the formal written variety of Modern Standard Arabic used in literacy contexts. Saiegh-Haddad (2020) argues that the linguistic distance between these varieties may influence how children develop phonological and orthographic awareness during reading acquisition. Exposure to such variation may encourage early awareness of the relationship between spoken and written language forms. This experience could

potentially influence how children approach additional languages such as English, particularly when encountering written forms that differ from their spoken vocabulary.

At the same time, the findings of the present study differ in some respects from patterns reported in bilingual contexts that do not involve diglossia. Studies of children who acquire two spoken languages simultaneously often report stronger integration between lexical form and meaning during early vocabulary development. In contrast, the children in the present study demonstrated stronger recognition of orthographic forms than semantic understanding. One possible explanation for this difference lies in the nature of English exposure in the present context. For the participants in this study, English input was primarily limited to classroom instruction rather than everyday communication. As a result, children may encounter written or visually presented word forms in educational materials before developing rich semantic representations associated with those words.

To conclude, the findings suggest that early second-language literacy development involves a gradual progression from visual recognition of written forms toward deeper semantic understanding. The strategies observed in the qualitative analysis illustrate how young learners actively attempt to construct connections between orthography, phonology, and meaning even when their lexical knowledge remains limited. Within the diglossic linguistic environment of Arabic-speaking contexts, these processes may be further influenced by children's early experiences with multiple linguistic systems. The results therefore contribute to a growing body of research highlighting the complex interaction between linguistic environment, cognitive development, and early literacy acquisition.

8. Limitations of the Study

Despite providing valuable insights into early second-language word recognition among preschool children, the present study has several limitations that should be acknowledged. First, the study involved a relatively small sample of participants drawn from a single kindergarten. As a result, the findings may not fully represent the broader population of Libyan preschool learners. Future research could strengthen the generalizability of the results by including larger and more diverse participant groups from different educational settings.

Second, the study did not control for variations in children's exposure to English outside the classroom. Differences in home environment, media exposure, or parental support for English learning may influence vocabulary knowledge and word recognition performance. Investigating the role of language exposure in greater detail could therefore provide a more comprehensive understanding of early bilingual literacy development.

Finally, the experimental tasks relied on picture-based stimuli, which may have influenced children's responses. Some participants may have used visual elimination strategies rather than relying solely on lexical knowledge when selecting the correct

image. Future studies could incorporate additional task types to examine word recognition and meaning identification under different experimental conditions.

9. Conclusion

This study explored how preschool children in a Libyan Arabic-English learning context respond to written English words during the early stages of language and literacy development. By examining children's performance in tasks involving word recognition and meaning identification, the study aimed to better understand how young learners begin to connect written forms with conceptual knowledge when exposure to the second language is still limited.

The results indicate that children were generally more successful in recognizing written English word forms than in identifying their meanings. This pattern suggests that familiarity with the visual form of words may develop before children establish stable semantic associations. In other words, children may begin to recognize certain written words as familiar items in their learning environment even when their understanding of the meanings associated with those forms remains incomplete. The presence of this pattern among preschool learners highlights the gradual and incremental nature of early lexical development in a second language.

Age-related differences were also evident in the findings. The six-year-old participants demonstrated higher levels of accuracy than the five-year-olds across both experimental tasks. This difference likely reflects the combined influence of cognitive maturation and increased exposure to English through classroom activities. Even within the relatively narrow age range represented in the study, small increases in linguistic experience appear to contribute to noticeable improvements in early word recognition and vocabulary processing.

Observations of children's responses during the tasks further revealed that learners actively employed a range of strategies while attempting to interpret written words. Some children focused on visual characteristics of the written form, indicating emerging awareness of orthographic patterns. Others repeated the words aloud while considering possible meanings, suggesting the use of phonological rehearsal as a way of activating stored vocabulary knowledge. In addition, instances of semantic approximation showed that children sometimes relied on broader conceptual associations when they were unable to retrieve the precise meaning of a word. Together, these behaviors illustrate how young learners draw on multiple sources of knowledge when encountering unfamiliar linguistic input.

The broader linguistic environment in which the children are raised may also shape these early literacy processes. Growing up in a diglossic Arabic context requires children to navigate differences between spoken and written language from an early age. This experience may influence how children approach written language more generally, including the learning of English as an additional language. Understanding how these sociolinguistic conditions interact with early literacy development remains an important area for further research.

To sum up, the findings of the study contribute to ongoing discussions about the relationship between word recognition and semantic development in early second-language learning. They suggest that exposure to written forms, even at a basic level, may support the gradual development of lexical knowledge among young learners. Continued investigation of these processes in different linguistic and educational contexts will help deepen our understanding of how children begin to build connections between written language and meaning during the earliest stages of bilingual literacy development.

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