Reading stories in Arabic: the impact of lexico-phonological and diglossic distance level on comprehension and receptive and productive vocabulary among Arab kindergarten children

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Purpose: This study aims to investigate the impact of the lexico-phonological diglossic distance of story reading (a scaffolded storybook intervention, informed by Vygotsky's theory of scaffolding and fading) on Arabic-speaking preschool children's comprehension and receptive and productive vocabulary.

Method: The participants were 139 Israeli-Palestinian kindergartners: 71 composed an intervention group and 68 composed a comparison group. The intervention group heard stories gradually from the SpA, identical, cognate, and unique word forms, whereas the comparison group heard traditional stories unrelated to their lexico-phonological distances. Story 1 was read in unique spoken Arabic (SpA) form, stories 2 and 3 were read in 58 and 45% identical and cognate word forms, respectively, and story 4 was read in 70% unique word forms.

Results: The results clearly showed that children's vocabulary and story understanding was significantly higher after the intervention, especially noticeable in stories that contained a higher proportion of Standard Arabic (StA). Interestingly, the stories told entirely in Spoken Arabic (SpA) were the most effective, yielding the highest scores in both comprehension and vocabulary. Stories that mixed different word forms also performed well, though not as strongly as the SpA stories, while those solely in StA were the least effective.

Conclusion: The findings of the study suggest that scaffolded storybook intervention may enhance the receptive vocabulary and comprehension skills of children. This study shows that, in the context of diglossia, stories should be read to children systematically and gradually according to the lexical-phonological distance of words in the stories.

KEYWORDS

Arabic, stories, diglossia, lexical phonological distance, receptive, productive, listening comprehension, kindergarten children

Introduction

Reading storybooks to young children in Western society is considered a daily activity at home and in educational settings (Mol et al., 2008), and it is widely recommended in educational literature (Snow, 1983; Rubin and Wilson, 1995; Kaderavek and Justice, 2002). An extensive body of research has indicated that preschoolers' exposure to storybooks promotes their vocabulary, language growth, listening comprehension skills, emergent literacy, and reading achievement (Sénéchal and LeFevre, 2002; Hindman et al., 2008). In kindergartens, while early childhood teachers have to enhance an appropriate teaching–learning process for children, they must consider the criteria of picture books, story complexity, and the age level of the children. However, reading storybooks is considered less natural and more complex in Arabic than in other languages because of Arabic's diglossic nature, that is the linguistic distance between children's spoken language and the standard language of the stories (Maamouri, 1998). This linguistic duality leads kindergarten teachers to switch between the two varieties of Arabic while speaking or storytelling (Shahbari-Kassem and Amara, 2022).

Approaches to reading storybooks to children in Arabic differ in the extent to which the story combines the standard and spoken forms of the language (Al Hadidi, 2010; Hassona-Arafat, 2011). Thus, there is ongoing research in the Arab world on the right technique for reading books to children in Arabic, with a focus on an effective combination of spoken and standard Arabic. The first approach focuses on the major dichotomous linguistic distance between the spoken and standard forms of Arabic (Ferguson, 1959). Thus, teachers are recommended to read stories to children only in the spoken form of Arabic, which they are exposed to at home and can understand more efficiently (Al Hadidi, 2010). The second approach claims that there is no complete separation between the two varieties of the language; rather, there is a linguistic scale or continuum in Arabic (Badawi, 1985; Grosjean, 1989). Therefore, it is recommended that language forms be combined when children read storybooks to help them improve their linguistic abilities. Thus, educators suggest gradually moving from spoken to standard forms when reading storybooks to kindergarten children (Daem and Yonis, 2007). The third approach relates to diglossia as a bilingual situation of two similar languages, which implies that the two forms of Arabic (standard and spoken) are like two different codes or languages that speakers switch between during communication, a process known as code-switching (Boussofara-Omar, 2003). This approach suggests that reading storybooks to children should involve code-switching between the standard and spoken forms of Arabic to reflect natural language use (Boussofara-Omar, 2003).

Diglossia in Arabic: issues and earlier research

An important aspect of the Arabic language that has important implications for reading stories is diglossia. Diglossia refers to a sociolinguistic situation where a speech community employs two varieties of the same language for distinct purposes: one is designated as the Low (L) variety, used for everyday informal communication, while the other is the High (H) variety, reserved for formal contexts and predominantly for literacy purposes (Ferguson, 1959). Spoken

Arabic (SpA) is used by all Arabic speakers for everyday speech at home, work, market, etc., and (modern) standard Arabic (MSA, StA) is the only variety used for conventional reading and writing (Haeri, 2000; Saiegh-Haddad, 2003, 2012; Hende, 2011). All spoken varieties of Arabic are linguistically related to StA (Maamouri, 1998). However, they differ in all domains of language: phonology, morphology, syntax, and lexicons (Hende, 2011; Saiegh-Haddad and Henkin-Roitfarb, 2014). Feitelson et al. (1993) demonstrate the positive effect of exposure to StA in kindergarten, through storybook oral reading, on literary language development in children.

Lexico-phonological distance between standard Arabic and spoken Arabic

Cross-linguistic research has examined the reading of storybooks and telling of stories to children from various populations and languages (Fichman et al., 2017). However, studies on reading stories in Arabic are scarce (Leikin et al., 2014; Ravid et al., 2014). Asli-Badarneh et al. (2023) examine the relationship between narrative microstructure (the language deployed in telling the story) and macrostructure (capturing the global structure of a story: Story Grammar elements) in Arabic-speaking immigrant students in Canada. Their findings demonstrate that, in addition to general linguistic indicators, narrative macrostructural ability in Arabic is uniquely predicted by diglossia-specific lexical features, and specifically using StA lexical and lexico-phonological features. Moreover, their findings reveal that the lexicons that children deploy consist mainly of SpA word forms (59.46% of the total number of word types): identical words (21.55%), SpA cognates (25.73%), and unique SpA words (12.18%). However, StA words comprise only 38.59%: StA cognates (19.97%) and unique StA words (18.62%). They identified these different forms of the same word in SpA and StA as SpA cognates and StA cognates, respectively. Their results reveal that children produced more SpA cognates than StA cognates. These findings indicate the retrievability of SpA word forms compared with the StA forms. The study by Asli-Badarneh et al. (2023) provides valuable insights into the impact of diglossia on narrative skills among Arabic-speaking immigrant students in Canada, highlighting the role of diglossia-specific lexical features in narrative macrostructure. Their findings underscore the importance of considering the lexico-phonological features of Standard Arabic (StA) and Spoken Arabic (SpA) in educational contexts. This is particularly relevant to our current investigation, which aims to explore how the lexico-phonological diglossic distance influences story comprehension, production, and vocabulary among Arabic-speaking kindergarten children. By examining the effects of reading storybooks that vary in their use of identical, cognate, and unique vocabulary forms, our study seeks to extend the understanding of diglossia's impact on early language and literacy development. Specifically, we aim to determine how different levels of diglossic distance in storybooks affect children's receptive and productive vocabulary and listening comprehension. The findings of Asli-Badarneh et al. (2023) suggest that diglossia-specific lexical features play a significant role in narrative skills, which supports the premise of our study that the degree of lexical distance in storybooks may have a critical impact on children's language outcomes. Therefore, our research builds upon and expands the existing knowledge base established by studies like Asli-Badarneh

et al. (2023), by focusing on the educational implications of diglossia in the context of reading to children in Arabic-speaking environments.

In a study on the lexical distance between StA and a variety of spoken Palestinian Arabic, Saiegh-Haddad and Spolsky (2014) observe that only 21.2% of the spoken lexicon of 5-year-old children consists of identical words shared between StA and their spoken vernacular, e.g., /žamal/ "a camel," or /daftar/ "notebook." Another 40.6% are cognates, namely shared words that only partially overlap phonologically, e.g., /ʃams/— SpA /ʃamis/ "sun," and another 38.2% are unique spoken words; they have a lexical and phonological form in SpA that is completely different from their form in StA (e.g., StA /takhet/— SpA /sari:r/ "bed"). Familiarity with StA's unique structures is expected to grow with grade level and with increasing exposure to StA at school (Saiegh-Haddad et al., 2020; Asli-Badarneh and Asadi, 2023; Asadi and Asli-Badarneh, 2023).

The linguistic distance between SpA and StA impacts kindergarten children's acquisition of literacy skills, such as reading and reading comprehension (Hende, 2011), and the acquisition of basic language (Tallas-Mahajna et al., 2022; Asadi et al., 2024). For instance, the phonological distance between StA and the spoken vernacular of children affects the ability to construct and access high-quality phonological representations of lexical items (Saiegh-Haddad and Haj, 2018). Moreover, given the linguistic distance but the close linguistic relatedness and structural overlap between the two varieties, it is interesting to investigate the scope of interference from, and reliance on, linguistic forms from the spoken versus standard variety (e.g., lexical and lexico-phonological features) when reading stories that vary in the degree of diglossic distance. Further, its impact on children's story comprehension and receptive and productive vocabulary should be investigated. Given that storybooks are read and written in StA, a language variety that children do not speak, one aspect of narrative skill development relates to children's production of a story told to them in StA. Ravid et al. (2014) examine narrative development among monolingual Arabic children across seven age groups (nursery school to adulthood) in Israel. They use retelling tasks (in StAs). The findings reveal a predicted increase in story length with age and education. More specifically, the children produce both StA and SpA forms, although it is assumed that they use StA. StA production increases with grade level. This implies the importance of StA in narrative production in Arabic to minimize the linguistic gap between StA and SpA, suggesting that Arabic speakers enhance their narrative abilities through their exposure to StA. Another aspect of narrative skill development relates to children's comprehension of a story. Leikin et al. (2014) test narrative comprehension and production in SpA and StA among 30 Arab preschool children by asking them to retell two stories: one in StA and one in SpA. Further, the children are asked to complete comprehension questions after each narration. The findings reveal that the narrative comprehension of the StA stories is lower than that of the SpA stories. Regarding narrative production, the findings reveal that children produce shorter narratives and clauses and make more morphosyntactic errors in StA than in SpA. The findings imply that preschool children demonstrated strong narrative comprehension skills in both SpA and StA, with only slightly lower performance in StA compared to SpA. While there was a small difference, the children's high level of comprehension in StA suggests they are making good progress in acquiring this variety, despite the linguistic distance from their spoken home language. Similar findings have been reported in the context of listening comprehension. Asadi

et al. (2022) examined the impact of diglossia on listening comprehension using SpA and StA texts among typically developing children and others diagnosed with a developmental language disorder. The findings reveal higher listening comprehension performance (including higher-order comprehension skills) for SpA texts than for StA texts; this gap between the SpA and StA varieties decreases with age only among typically developing children. However, a recent study examined how children understood and expressed simple stories that were accompanied by pictures, considering both the narrative complexity and the language used (Kawar et al., 2023). The findings indicated that children had a better understanding of stories presented in StA compared to SpA. Additionally, the study found that children tended to produce longer texts when the stories were more complex. The study's findings suggest that preschool children have already passively acquired a sufficient amount of StA vocabulary and structure to retell and comprehend short, picture-supported narratives presented in StA. These results are encouraging when considering language and literacy development in the context of Arabic diglossia.

Many studies have focused on children's Arabic-language story production; however, only one has focused on the language form of the stories read to children. Masarweh and Aram (2018) compare the relative effectiveness of telling a story to children in the SpA-only, StA-only, and combined SpA and StA modes. The study targets kindergarten children, and the dependent variables are story production, comprehension, and vocabulary. This intervention study shows that in all conditions compared with the comparison group, telling a story enhances children's vocabulary and story production. Interestingly, only when telling the story in StA does the children's comprehension of the story significantly increase. This implies that stories in StA are challenging for children's comprehension (Masarweh and Aram, 2018). Based on recent research on narrative development among Arabic speakers, studies have indicated that the lexicon of Arabic speakers is divided into spoken and standard forms of Arabic. However, there is a difference in the lexico-phonological diglossic distance of words based on the categorization of identical, cognate, and unique words (see Saiegh-Haddad and Spolsky, 2014; Asli-Badarneh et al., 2023). Given the diglossic issue, we do not know the extent to which the degree of lexical distance features affects storybook comprehension and variables such as vocabulary and listening comprehension among Arabic kindergarten children.

The role of intervention in improving children's narrative skills has received little empirical attention and it is mainly focused on children with developmental language difficulties (Hayward and Schneider, 2000; Davies et al., 2004). Previous narrative interventions have focused on school-aged children; however, research has proposed that interventions on a narrative structure can effectively develop the oral narratives of children in preschool (Davies et al., 2004). Thus, an effective approach for preschool children is necessary. To date, no study has examined the impact of the intervention of reading stories at several lexico-phonological levels on narration in terms of receptive and productive vocabulary and listening comprehension among Arabic-speaking children. For example, given the diglossic issue, we do not know the extent to which narrative production in the spoken variety benefits from an intervention focused on developing language and narrative structure.

Given the multifaceted nature of language acquisition, this study explores the potential influence of lexico-phonological characteristics of stories on children's language development, acknowledging that these relationships appear to be nonlinear and complex.

The present study employs a scaffolded approach to storybook reading, informed by Vygotsky's theory of scaffolding and fading (Vygotsky, 1978). Daem and Yonis (2007) provided a foundational approach that this study seeks to build upon. Our findings aim to further validate and expand upon their methodology by applying it to the context of Arabic diglossia and storybook reading. This approach aims to support children's linguistic development by gradually increasing the challenge of the linguistic input during storybook reading sessions. By exposing children to stories with varying degrees of lexico-phonological diglossic distance, the intervention aims to enhance their story comprehension and receptive and productive vocabulary skills.

The present study

The difficulty faced by early kindergarten children in understanding Arabic storybooks motivates us as "early childhood educators" to examine the impact of the lexico-phonological diglossic distance level (identical, cognate, and unique vocabulary) on story receptive and productive vocabulary and listening comprehension among Arabic kindergarten children. Arabic-speaking children in the north of Israel (from one town; they use SpA) are educated in one language.

The objective of the study is to examine the impact of the lexico-phonological and diglossic distance of stories read to children on children's story comprehension, production, and vocabulary. In this study, children listen to stories with increasing proportions of StA vocabulary. This research examines two groups: an intervention group exposed to a scaffolded storytelling approach and a comparison group following the regular curriculum. By analyzing the language outcomes within each group separately, we aim to understand how varying levels of exposure to Standard Arabic (StA) influence children's language skills.

The intervention group participated in a structured program where stories progressively incorporated higher proportions of StA vocabulary, starting with stories in Spoken Arabic (SpA) and moving to those with a mix of SpA and StA. This scaffolded approach was designed to gradually increase the linguistic challenge and support children's language development. In contrast, the comparison group continued with the regular curriculum without these targeted interventions.

This study seeks to provide insights into the role of diglossic distance in narrative comprehension and vocabulary acquisition, contributing to our understanding of language development in diglossic contexts.

This study asks the following question: Do the lexico-phonological diglossic distance of story reading (a scaffolded storybook intervention, informed by Vygotsky's theory of scaffolding and fading) impact children's comprehension and receptive and productive vocabulary on Arabic-speaking preschool? Specifically, we hypothesize that children exposed to stories with higher proportions of words

unique to StA and not present in SpA will exhibit lower performance in receptive and productive vocabulary and listening comprehension compared to other conditions, including spoken, identical, and cognate forms.

Method

Research design

This quantitative study looks at the effect of lexico-phonological diglossic distance in storybooks on Arabic-speaking kindergarteners' story comprehension, receptive vocabulary, and productive vocabulary. The independent variable is the lexico-phonological diglossic level of the story's words, which are divided into four categories in the intervention: (1) unique Spoken Arabic (SpA), (2) identical, (3) cognate, and (4) unique Standard Arabic. The dependent variables are the children's comprehension of stories, as well as their receptive and productive vocabulary.

Participants

The study involved 139 Israeli-Palestinian kindergartners (mean age = 68.81 months, SD = 4.16) from Arabic-medium public school kindergarten centers. These children, monolingual- native speakers of a local dialect of the Northern-Palestinian vernacular, were randomly selected, ensuring they had no developmental, linguistic, hearing, or sensory problems as confirmed by their kindergarten teachers. The sample was divided into an intervention group (n = 71) and a comparison group (n = 68), with the intervention group participating in a structured storybook reading program and the comparison group receiving the regular curriculum without targeted reading intervention.

Intervention program

The intervention program spanned 3 months, with children in the intervention group engaging in weekly storybook reading sessions. The approximately 4–5 children from each 6 classrooms were divided by the kindergarten teachers into small groups. Small groups participated in story activities once a week for 20 min, facilitated by two trained students who spoke the same Arabic vernacular as the children, who used selected storybooks that varied in complexity and diglossic features. The activities involved listening to a story mediated by a kindergarten teacher. All the children from the intervention and the comparison group were tested for their story comprehension and receptive and productive vocabulary skills pre and post of the intervention program (see Table 1).

Children were grouped by their kindergarten teachers into small clusters of 4–5, ensuring personalized attention during the weekly 20-min story sessions. The kindergarten teacher facilitated the story activities, ensuring that the children were engaged and following along with the story. These sessions were led by two trained students, fluent in the children's vernacular, who facilitated interactive storybook readings. They assisted the kindergarten teacher by leading small group discussions, asking questions to deepen comprehension, and encouraging children to participate in activities related to the stories.

TABLE 1 The phonolexical vocabulary (unique StA, identical and cognate forms) before producing phonolexical changes.

Story name	Total number of words	Unique StA words		Identical words		Cognate words	
		N	%	N	%	N	%
Story 1–Joud be careful	424	154	36%	103	24%	167	39%
Story 2–The lie that grew	326	137	42%	45	14%	144	44%
Story 3–Do not worry dad	381	159	42%	90	24%	132	34%
Story 4–Not yet	370	162	44%	58	16%	150	40%

The structured sessions aimed not only at reading but also at engaging children in discussions and activities related to the stories to deepen their comprehension and vocabulary acquisition. Assessments were conducted at three critical junctures: before the intervention, after the completion of each story, and at the intervention's conclusion, to gauge the children's progress in story comprehension, and receptive and productive vocabulary skills.

These sessions in the intervention group were designed to gradually expose children to higher levels of lexico-phonological diglossic distance, starting with stories in SpA and progressing to stories with a higher proportion of StA vocabulary. This scaffolded approach, informed by Vygotsky's theory of scaffolding and fading (Vygotsky, 1978), aimed to support children's linguistic development by gradually increasing the challenge of the linguistic input. Over the course of the three-month intervention, children in the intervention group were exposed to four carefully selected storybooks, each representing different levels of lexico-phonological diglossic distance. The intervention commenced with 'Story 1–Joud be careful,' which is entirely in Spoken Arabic (SpA), progressing to 'Story 2–The lie that grew' and 'Story 3–Do not worry Dad,' which incorporate a mix of SpA and Standard Arabic (StA) in the form of identical-cognates, and culminating with 'Story 4–Not yet,' predominantly in StA. This sequence was designed to scaffold children's exposure to StA, enhancing their comprehension and vocabulary in both dialects. Each story was introduced weekly in the specified order, and this cycle was repeated throughout the intervention period to reinforce learning and familiarity with both linguistic forms. Each of the four stories, representing different levels of lexico-phonological diglossic distance, was introduced weekly in the specified order outlined in Table 2. This cycle, consisting of Story 1 (100% SpA) in Weeks 1–3, Story 2 (58% identical-cognates) in Weeks 4–6, Story 3 (45% identical-cognates) in Weeks 7–9, and Story 4 (70% unique StA) in Weeks 10–12, was repeated throughout the 12-week intervention period. This repetition aimed to reinforce the children's learning and familiarity with both the SpA and StA linguistic forms (see Table 2).

The kindergarten teachers from the intervention group participated in a study group that met with four experts (the authors) twice before the beginning of the study. The experts and teachers participated in general discussions. The meetings addressed an array of topics: the significance of early literacy in reading and spelling acquisition and academic success, diglossia and its effect on literacy acquisition in Arabic, and the role of the teachers' self-efficacy and accountability in promoting literacy.

In contrast to the intervention group, the comparison group continued with the regular curriculum without these targeted reading interventions. The comparison group teachers did not participate in any study groups. Each classroom in the comparison group consisted

of approximately 4–5 children, similar to the intervention group. The group size for the comparison group was the entire class, ensuring that the traditional instruction was consistent with typical classroom settings. Traditional instruction involved standard teacher-led activities, which included reading stories, engaging in discussions, and conducting vocabulary exercises. The stories used in traditional instruction varied in their proportion of Spoken Arabic (SpA) and Standard Arabic (StA), but specific details on the exact proportion were not provided. It is important to note that the children in the intervention group also received traditional instruction alongside the scaffolded storybook reading sessions. The traditional instruction for the intervention group occurred daily, while the scaffolded storybook reading sessions were conducted once a week for 20 min.

While this study employs an intervention and comparison group design to explore the effects of scaffolded storybook reading, it is important to note that this approach does not constitute a causal research design. Factors such as teacher professional development and the implementation of small group interventions, which were provided to the intervention group but not the comparisons, could influence the outcomes. Therefore, the results should be interpreted with caution. The study design does not allow for a direct comparison between the two groups, as the comparison group did not receive the intervention. Instead, the results are analyzed within each group to understand the effects of diglossic distance on language outcomes.

Measures

Storybooks

Four storybooks (Story 1–Joud be careful, Story 2–The lie that grew, Story 3–Do not worry Dad Story 4–Not yet) were selected based on their complexity, length, and inclusion of at least one problem and resolution episode. The stories were initially mapped for their use of lexico-phonological vocabulary (unique StA, identical, and cognate forms). To address the methodological concerns, we ensured that the selection of word types (identical, cognate, unique SpA, and unique StA) was based on their natural occurrence in spoken and standard Arabic, reflecting the linguistic reality of the children's environment. The categorization of word types in this study was based on a comparison to the specific Palestinian dialect (SpA) spoken by the children. For example, the word قطة /Ketta/ meaning "cat" is unique to the examined Palestinian dialect, but would be considered a cognate in the Egyptian dialect. Therefore, the classification of word type was determined by the target dialect of the participants). This approach aimed to investigate the impact of varying degrees of diglossic distance on comprehension and vocabulary acquisition. These stories were taken directly from the classrooms, ensuring ecological validity, and

TABLE 2 Research design based on Scaffolding–Fading, social development theory of Vygotsky.

Group	Week	Story title	Lexico-phonological characteristics	Percentage of word types	Description of session activities	Assessment points
Intervention	Week 1–3: 20-min sessions once a week	Joud be careful	100% Spoken Arabic (SpA)	100% SpA	Introduction to story, reading, and discussion. Focus on familiar vocabulary.	*Pretest:* Conducted before starting the intervention to establish a baseline for vocabulary and comprehension. *Posttest:* Conducted at the end of Week 12 to assess gains in vocabulary and comprehension.
	Week 4–6: 20-min sessions once a week	The lie that grew	58% Identical-Cognates	58% Identical-Cognates	Reading and activities emphasizing the cognate vocabulary.	
	Week 7–9: 20-min sessions once a week	Do not worry Dad	45% Identical-Cognates	45% Identical-Cognates	Reading and activities with a higher proportion of StA vocabulary.	
	Week 10–12: 20-min sessions once a week	Not yet	70% Unique Standard Arabic (StA)	70% Unique StA	Reading and activities focusing on unique StA vocabulary.	
Comparison -Without the targeted lexico-phonological scaffolding that was applied to the intervention group	Week 1–3	Traditional Story 1 in SpA	The traditional story in 100% SpA	Regular curriculum without targeted reading	Standard classroom activities without additional storybook reading sessions or structured interventions	*Pretest*: Same as Intervention Group, to establish a baseline. *Posttest*: Same as Intervention Group, to compare with the intervention outcomes.
	Week 4–6	Traditional Story 2	Traditional story (80% identical cognate)	Regular curriculum without targeted reading interventions	Standard classroom activities without additional storybook reading sessions or structured interventions	
	Week 7–9	Traditional Story 3	Traditional story (79% identical cognate)	Regular curriculum without targeted reading interventions	Regular curriculum without targeted reading interventions	
	Week 10–12	Traditional Story 4	The traditional story in StA (80% identical cognate)	Regular curriculum without targeted reading interventions	Regular curriculum without targeted reading interventions	

TABLE 3 The phonolexical vocabulary (unique StA, identical and cognate forms) after producing phonolexical changes.

Story name	Total number of words	Unique StA words		Identical words		Cognate words	
		N	%	N	%	N	%
Story 1–Joud be careful	424	0	0%	424	100%	0	0%
Story 2–The lie that grew	326	137	42%	143	44%	46	14%
Story 3–Do not worry Dad	381	210	55%	130	34%	41	11%
Story 4–Not yet	370	259	70%	78	21%	33	9%

belong to the same author and level series, providing consistency in style and content complexity. These stories underwent expert review by consultants and specialists in children's literature to ensure quality and educational value (checking age-appropriateness and lexico phonological distance (a distribution of identical, cognate, and unique words). The stories were chosen to reflect the natural linguistic characteristics of Arabic, with the percentages of unique SpA, identical, cognate, and unique StA words mirroring the linguistic reality of the children's environment (21.2% identical words, 38.4% cognates. 40.2% unique). These percentages represent the maximum achievable representation of the natural lexico-phonological distribution in Arabic based on the language features and previous research findings (Saiegh-Haddad and Spolsky, 2014; Asli-Badarneh et al., 2023).

Based on the four selected stories, four new parallel versions were produced based on phonolexical changes (unique StA, identical, and cognate forms) for the intervention group. Each story included both low and high word frequencies, according to the word frequency scale, which was assessed by kindergarten teachers. Story 1 (انتبهي يا جود "Joud be careful") included 100% SpA phonolexical words while reading the story. Story 2 (الكذبة التي كبرت "The lie that grew") included 58% identical and cognate words. Story 3 included 45% identical and cognate words. Story 4 included 60% unique words and 30% cognate and identical words. No phonolexical changes were made while reading the story.

The order of reading (see Table 2) the four stories was determined after consultation with several experts in children's literature taking into account increasing complexity the stories were arranged in order of increasing lexico phonological distance, with the least complex story (Story 1 with 100% SpA words) read first, followed by stories with gradually increasing proportions of StA vocabulary and Scaffolding (the scaffolded approach, informed by Vygotsky's theory of scaffolding and fading, aimed to support children's linguistic development by gradually increasing the challenge of the linguistic input).

Table 3 shows the mapping of the phonolexical vocabulary (unique StA, identical, and cognate forms) after producing phonolexical changes.

Table 2 provides an overview of the traditional stories (Story 1–4) that the comparison group was exposed to during the intervention period (Stories 1–4 in their unmodified versions were among the traditional stories that all children were exposed to during regular classroom instruction). The comparison group was exposed to traditional stories (Story 1–4) that did not follow a scaffolded approach. Story 1 ("Traditional Story 1") consisted of 100% SpA words. Story 2 ("Traditional Story 2") included around 80% identical cognates, and 20% unique StA words. Story 3 ("Traditional Story 3") had a distribution of 75% identical cognates,

and 25% unique StA words. Finally, Story 4 ("Traditional Story 4") contained about 70% identical cognates, and 30% unique StA words. However, intervention children were exposed to Stories 1–4 in their modified (scaffolded) versions during intervention lessons.

Vocabulary tests

The Arabic receptive vocabulary test along with the Arabic Productive Vocabulary Naming Test were designed to assess the children's understanding and production of words from the intervention stories. The tests included items for each word type (identical, cognate, and unique StA), with scoring criteria clearly defined. Words in the tests were chosen considering criteria such as the age of Acquisition (Words were chosen based on their typical acquisition age, ensuring that they are age-appropriate for kindergarten children), frequency (the frequency of words was carefully considered, selecting words that are commonly used in daily communication within the children's linguistic environment. This includes a mix of high-frequency words that children are likely to encounter often, and lower-frequency words that provide a challenge in comprehension and production), word types (each test included 12 target words from each story, categorized into four identical, four cognates, and four unique StA words).

Arabic productive vocabulary naming test: Conceived as a receptive picture vocabulary test, this assessment comprised four tasks corresponding to the four intervention stories. A productive vocabulary test was constructed using 12 target pictures of words in each story type (divided into four identical, four cognate, and four StA unique words). The children were shown a picture. They were asked to produce a word corresponding to the picture shown by the examiner. They were awarded 1 point for each word appropriately identified. The analysis Cronbach's alpha value was 0.89. In examining the productive vocabulary skills, our analysis indicated a clear pattern influenced by the lexico-phonological distance of the words used in the stories.

Story comprehension

Four tasks were conducted for the four stories. Story comprehension was assessed through questions that required children to recall and infer information from the stories. The children were asked listening comprehension questions about each story without reading the story again. The questions included eight items adapted from the multilingual assessment instrument for the narratives project (Hende, 2011; Gagarina et al., 2015). The questions from the MAIN are designed to appropriately match the language proficiency levels of children, ensuring that the vocabulary, sentence structure, and complexity are suitable for their age and educational background. The

TABLE 4 Means and standard deviation (SD) of receptive vocabulary performance on the story lexical distances by the groups.

Test	Story lexical distance	Comparison		Intervention	
Receptive vocabulary		*M*	SD	*M*	SD
	Story 1 (SpA)	11.67	0.56	11.78	0.59
	Story 2 (58%)	10.47	2.00	11.44	0.96
	Story 3 (45%)	10.45	2.06	11.10	1.27
	Story 4 (unique StA)	10.54	2.25	10.33	2.4

questions included literal and inferential questions about different parts of the story; they included four questions targeting the characters in the story (e.g., Joud helped her friend). Four questions elicited internal state terms (e.g., Why did that happen?). The questions were scored from 0\1 based on the coding of Gagarina et al. (2015) and Hende (2011). If the answer was right, the child received a score of 1, if the answer was wrong, the score was 0. The analysis of reliability resulted in Cronbach's alpha coefficient was 0.88.

Procedure

The intervention program spanned 3 months, with children in the intervention group engaging in weekly storybook reading sessions. These sessions were designed to gradually expose children to higher levels of lexico-phonological diglossic distance, starting with stories in SpA and progressing to stories with a higher proportion of StA vocabulary. This scaffolded approach, informed by Vygotsky's theory of scaffolding and fading, aimed to support children's linguistic development by gradually increasing the challenge of the linguistic input.

The children from each classroom were divided by the kindergarten teachers into groups of 4–5 children. Each group participated in story activities once a week for 20 min. The activities involved listening to a story mediated by a kindergarten teacher. All the children from both groups were tested for their story comprehension and receptive and productive vocabulary skills pre- and post-intervention program. Trained research assistants read the storybooks. The children were tested individually in a quiet environment by two graduate education students who spoke the same Arabic vernacular as the children. The children listened to the story narrated by the experimenter and followed along by looking at the pictures. Next, the children were asked to answer the questions in whichever language variety they liked while looking at the pictures.

The impact of the intervention was conducted in pre and post-test. The pre-test was initiated before the intervention. Post-tests were performed after the intervention period. Children's understanding of stories and vocabulary knowledge were evaluated through tests conducted before and after the intervention. The pretest scores were not used in the analysis. Text complexity, syntax, and other possible influencing variables were accounted for.

The research design was based on the scaffolding–fading of Vygotsky's (1978) social development theory (Table 2). Scaffolding refers to a temporal-assisted instructional technique in which the teacher and others provide support by gradually improving the student's ability to build on prior knowledge and get to the next stage or level Scaffolding can include modeling skills and providing cues, activities, or materials. Fading refers to the temporal nature of the support for teaching. The instructor gradually withdrew support to allow the student to develop independently.

Confidentiality and anonymity were assured to participants and their parents, with specific reassurance that their data will not be shared Pseudonyms were assigned, and participants were asked to provide written consent based on their understanding of the research objective. The study obtained ethical approval from the research ethics committee at the Arab Academic College in Haifa, Israel as well as consent from the Chief Scientist. This guarantees that the rights and well-being of the participants were protected throughout the study.

Analytic methods

To examine the performance on receptive vocabulary, productive vocabulary, and listening comprehension, three separate 4×2 repeated measures analyses of variance were conducted, with the groups (comparison and intervention) as between-subject variables and the story lexical phonological distance (story 1: 100% SpA, story 2: 58% identical–cognates, story 3: 45% identical–cognates, story 4: 70% unique StA) as a within-subject variable.
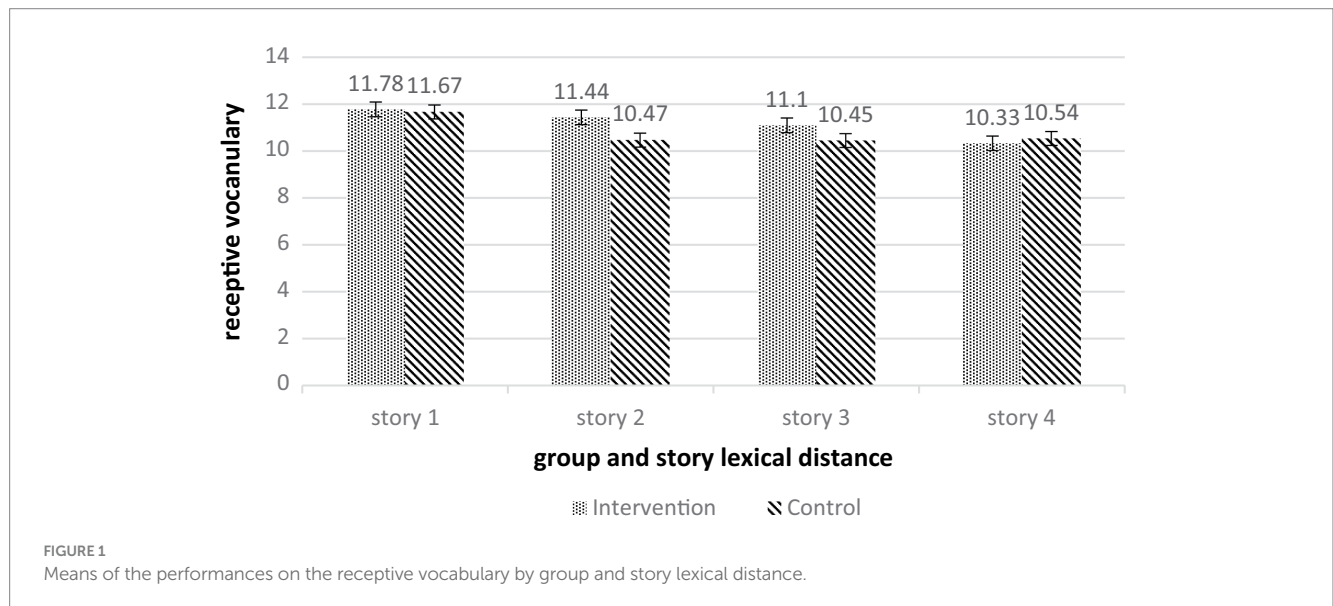
Results

Descriptives

Children's scores in receptive vocabulary, productive vocabulary, and listening comprehension showed clear differences based on the type of Arabic form used in the stories—from pure Spoken Arabic (SpA) to a mixture with Standard Arabic (StA). Table 4 highlights the changes in receptive vocabulary scores for both the intervention and comparison groups across the four-story types. For instance, in the intervention group, the average score for Story 1, which is completely in Spoken Arabic (SpA), was 11.78 with a small standard deviation of 0.59. However, scores dropped significantly to 10.33 (SD = 2.4) by Story 4, which uses primarily Standard Arabic (StA) ($p < 0.01$). The comparison group showed a similar decline but not significant from 11.67 (SD = 0.56) to 10.54 (SD = 2.25). Similarly, productive vocabulary outcomes, detailed in Table 5, decreased significantly as the stories incorporated more StA. The intervention group's scores decreased significantly from 58.54 (SD = 21.42) in Story 1 to 52.35 (SD = 20.33) in Story 4 ($p < 0.01$). The comparison group's scores also dipped slightly from 58.98 (SD = 17.43) to 52.26 (SD = 18.81). Table 6 in our manuscript shows how the children's listening comprehension scores varied depending on the story type. For the intervention group, the scores started at 7.08 (with SD of 0.87) for Story 1, which was entirely in Spoken Arabic (SpA). However, as the stories included more Standard Arabic (StA), we noticed a significant drop in scores—6.81 for Story 2, 5.85 for Story 3 ($p = 0.02$), and down to 5.49 for Story 4 ($p < 0.01$), which had the most StA. The comparison group showed a

TABLE 5 Means and SD of productive vocabulary performance on the story lexical distances by the groups.

Test	Story lexical distance	Comparison		Intervention	
Productive vocabulary		*M*	SD	*M*	SD
	Story 1 (SpA)	58.98	17.43	58.54	21.42
	Story 2 (58%)	56.24	21.11	56.64	19.99
	Story 3 (45%)	51.63	16.35	54.04	16.73
	Story 4 (unique StA)	52.26	18.81	52.35	20.33

TABLE 6 Means and SD of listening comprehension performance on the story lexical distances by the groups.

Test	Story lexical distance	Comparison		Intervention	
Listening comprehension		*M*	SD	*M*	SD
	Story 1 (SpA)	7.07	1.21	7.08	0.87
	Story 2 (58%)	5.57	1.89	6.81	1.46
	Story 3 (45%)	5.51	1.87	5.85	1.58
	Story 4 (unique StA)	5.38	1.86	5.49	2.15

FIGURE 1
Means of the performances on the receptive vocabulary by group and story lexical distance.

similar trend but generally scored a bit lower and not significant, beginning with 7.07 for Story 1 and falling to 5.38 by Story 4.

Receptive vocabulary

A significant effect of the story lexical-phonological distance was observed: $F (3, 136) = 20.41$, $p = 0.000$, $\eta^2 = 0.13$, indicating a better performance on the SpA than on the other StA stories. Within the intervention group, paired samples t-tests revealed that story 1 (SpA) > story 2 (58% story) [$t = 11.1$, $p = 0.03$] > story 3 (45% story) [$t = 13$, $p = 0.04$] > story 4 [$t = 15.2$, $p = 0.01$] (unique StA story). Within the comparison group, similar patterns were observed, though the gains were less pronounced. The results are summarized in Table 4.

Paired samples t-test examining the simple effect by comparing the performance on story lexical distance in each group separately revealed that the SpA story had the highest performance. The results showed that story 1 (SpA) > story 2 (58% story) [$t = 11.1$, $p = 0.02$] > story 3 (45% story) [$t = 13$, $p = 0.01$] > story 4 [$t = 15.2$, $p = 0.04$] (unique StA story). Independent t-test revealed that there was a significantly higher receptive vocabulary performance among the intervention group than the comparison group in story 2 (58%) and story 3 (45%) ($p < 0.05$), whereas there was no significant difference for story 1 (100% SpA) and story 4 (unique StA) (Figure 1).

Productive vocabulary

A significant effect of story lexical-phonological distance was observed: $F (3, 131) = 3.36$, $p = 0.02$, $\eta^2 = 0.07$, indicating a better performance for the SpA than for the other StA stories. Within the intervention group, paired samples t-tests revealed that story 1

(SpA) > story 2 (58% story) [$t = 10.5$, $p = 0.03$] > story 3 (45% story) [$t = 12.3$, $p = 0.01$] > story 4 (unique StA story) [$t = 14.1$, $p = 0.03$]. Within the comparison group, similar patterns were observed, though the gains were less pronounced. The results are summarized in Table 5.

Listening comprehension

A significant effect of the story lexical-phonological distance was observed: F (3, 136) = 22.45, $p = 0.000$, $\eta^2 = 0.15$, indicating better performance on the SpA than on the other StA stories. Within the intervention group, paired samples t-tests revealed that story 1 (SpA) > story 2 (58% story) [$t = 11.8$, $p = 0.01$] > story 3 (45% story) [$t = 13.5$, $p = 0.02$] > story 4 (unique StA story) [$t = 15.7$, $p = 0.04$]. Within the comparison group, similar patterns were observed, though the gains were less pronounced. The results are summarized in Table 5.

Paired samples t-test examining the simple effect by comparing the performance on story lexical distance in each group separately revealed that the SpA story had the highest performance. The results showed that story 1 (SpA) > story 2 (58% story) > story 3 (45% story) > story 4 (unique StA story). Independent t-test revealed that there was a significantly higher listening comprehension performance among the intervention group than the comparison group in story 2 (58%) [t (136) = −4.3, $p < 0.001$], whereas there was no significant difference for story 1 (100% SpA) [t (136) = −0.055, n.s], story 4 (unique StA) [t (136) = −0.30, n.s], and story 3 [t (136) = −1.14, n.s] (see Figure 2).

Discussion

This study examined the impact of the lexico-phonological diglossic distance of story reading (a scaffolded storybook intervention, informed by Vygotsky's theory of scaffolding and fading) on Arabic-speaking preschool children's comprehension and receptive and productive vocabulary.

For listening comprehension, a main effect of story lexical phonological distance was observed, indicating better performance on the SpA than on the other StA stories, which indicates that story 1 (SpA) > story 2 (58% story) > story 3 (45% story) > story 4 (unique StA). Within the intervention group, significant improvements were observed in receptive and productive vocabulary, as well as narrative comprehension, particularly with stories containing higher proportions of StA. The comparison group also demonstrated gains, though to a lesser extent, highlighting the influence of diglossic distance on language outcomes. These findings underscore the importance of gradual and systematic exposure to StA in enhancing linguistic skills in diglossic contexts. This finding corroborates those of previous studies that found that the comprehension performance of the StA story was lower than that of the SpA stories (Leikin et al., 2014). This difference in listening comprehension between SpA and StA stories has been observed among typically developing children and others diagnosed with developmental language disorders (Asadi et al., 2022). Our findings imply that the linguistic gap between the two forms of Arabic, SpA and StA, affects the listening comprehension of stories. However, they extend previous findings by adding two other lexico-phonological diglossic levels [story 2 (58% identical and cognates) and story 3 (45% identical and cognates)], demonstrating that the diglossic features (or degree of identical, cognates, and uniqueness) of the stories impact listening comprehension. The findings of the study reveal that including identical and SpA words in stories may enhance listening comprehension. Further, SpA and identical words are familiar and available in the children's lexicon; the children are exposed to those forms and use them from birth; therefore, they perform better in SpA stories. However, StA stories with mostly unfamiliar unique words may be difficult to access and represent in a child's mental lexicon (Saiegh-Haddad and Haj, 2018), and therefore, they are less accessible for listening comprehension. The middle alternative and less extreme diglossic levels, including less familiar cognate words in stories, are easier to comprehend than unique words because they are shared partially phonologically with SpA and are not as extremely
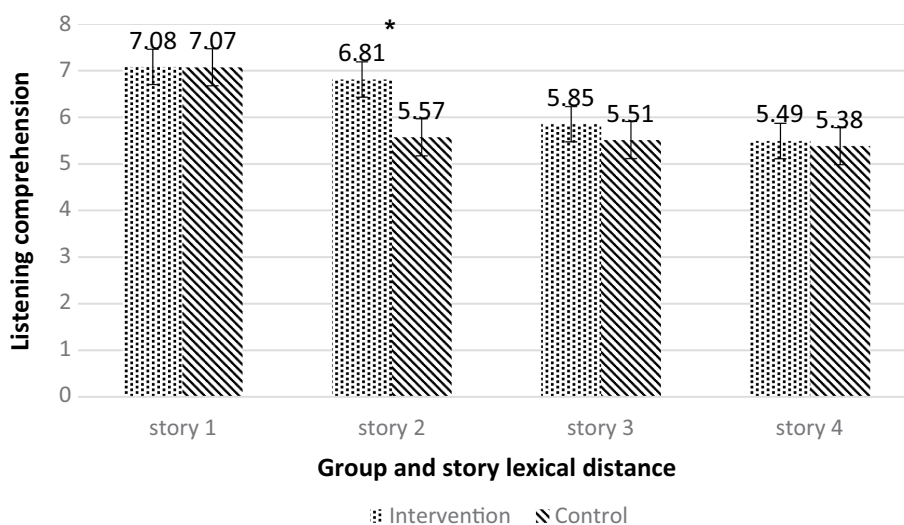
FIGURE 2
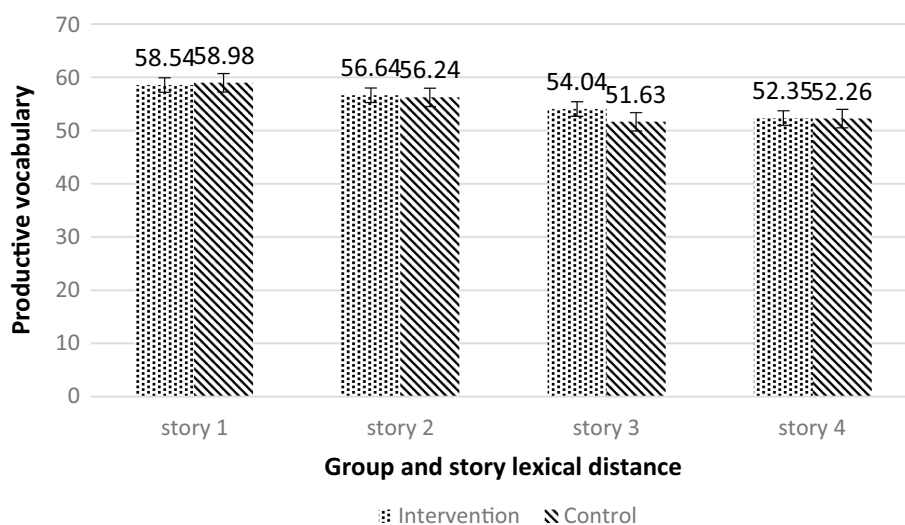Means of the performances on the listening comprehension by group and story lexical distance. *$p < 0.05$.

FIGURE 3
Means of the performances on the productive vocabulary by group and story lexical distance.

different as the unique StA. The difference between the comparison and intervention groups was derived from story 2, where the relative parts of identical and cognate words were included. This finding is significant, as it highlights the need to move beyond a simplistic dichotomy between spoken and standard forms in understanding Arabic diglossia (Ferguson, 1959). Moreover, Arabic diglossia exhibits a gradual transition from SpA to identical, cognate, and finally unique StA forms, aligning with Badawi's (1985) perspective, which suggests that Arabic diglossia operates on a linguistic scale or continuum (see Figure 3)

The results revealed that for receptive vocabulary, a main effect of story lexical phonological distance was found, indicating better performance on the SpA than on the other StA stories, which indicates that story 1 (SpA) > story 2 (58% story) > story 3 (45% story) > story 4 (unique StA). A group effect was observed, indicating that the receptive vocabulary of the comparison group was lower than that of the intervention group. Finally, the two-way interactions of the groups by the story lexical distance indicated higher receptive vocabulary performance for the intervention group than the comparison group only in story 2 (58%) and story 3 (45%). However, there was no significant difference between story 1 (100% SpA) and story 4 (unique StA). This result aligns with those of earlier research demonstrating the impact of Arabic diglossia on vocabulary (Hende, 2011; Fedda and Oweini, 2012; Masarweh and Aram, 2018). However, our results extend previous research by focusing on receptive vocabulary. Similar to the listening comprehension results, this finding demonstrates the difficulties of diglossic lexical-phonological distance and its impact on receptive vocabulary, according to which the representation of words in stories in the mental lexicon is based on lexical and phonological characteristics. The availability of the SpA and identical word representations contributes to efficient processing and improved receptive vocabulary performance. However, unfamiliarity with unique StA words in stories may lead to insufficient phonological-lexical word representation (Saiegh-Haddad and Joshi, 2014), which impedes the automatic word availability of unique forms and negatively impacts receptive vocabulary performance. Few familiar

cognate words that overlap in StA and SpA have a moderating effect on receptive vocabulary.

For productive vocabulary, a significant effect of story lexical phonological distance was observed, indicating better performance on the SpA than on the other StA stories, which means that story 1 (SpA) > story 2 (58% story) = story 3 (45% story) > story 4 (unique StA). The main effects of the group and two-way interactions were not significant. Similar to previous findings, this result indicates the impact of Arabic diglossia on vocabulary (Fedda and Oweini, 2012; Masarweh and Aram, 2018) and specifies that the poor representation of StA words in stories might explain the advantage of SpA and identical items > cognate > over unique StA items in terms of productive vocabulary. However, the nonexistent differences between the two middle stories (stories 2 and 3) and between the comparison and intervention groups are most likely due to the relative ease of the acquisition of receptive vocabulary compared with productive vocabulary knowledge. Mastering productive vocabulary involves more explicit vocabulary exercises and engaging in the productive use of words (saying the word, creating a sentence, and creating grammatical and collocational comparisons) (Lessard-Clouston, 2013). Unlike receptive vocabulary, using a word productively requires considerable information about the word (Schmitt, 2010, 2014).

Importantly, our findings highlight the critical role of the diglossic lexical-phonological distance of stories in listening comprehension and receptive and productive vocabulary. This finding corroborates previously reported findings indicating that an oral-lexical gap impacts language and literacy skill development (Hende, 2011; Perfetti and Stafura, 2014; Verhoeven et al., 2016; Saiegh-Haddad and Everatt, 2017). Further, it addresses the role of gradual and systematic oral use of and exposure to StA (identical, cognate, and unique) in minimizing the diglossic gap in Arabic. Choosing vocabulary and language that overlap in StA and SpA may affect vocabulary and comprehension skills. The availability of word representations in stories contributes to efficient processing during listening and comprehension. Based on our findings, poor knowledge, less familiarity, and the use of unique StAs lead to insufficient phonological-lexical word representation

(Saiegh-Haddad and Joshi, 2014), which impedes the automatic word availability of unique forms compared with familiar identical or less familiar cognate words. Manipulating less-retrieved and less-represented unique StA words in the mental lexicon is similar to manipulating pseudowords. Consequently, comprehension and linguistic skills are impeded.

To our knowledge, this study is the first to demonstrate that the lexico-phonological distance of stories read to children has a significant impact on vocabulary and listening comprehension skills in Arabic. However, this corresponds with previous studies that have suggested that diglossia impacts children's acquisition of basic linguistic skills (Ibrahim et al., 2007), and therefore, the use of and exposure to StA forms that minimize diglossia has a positive effect on language and linguistic scores. To enhance their vocabulary and listening comprehension skills, children have to fully acquire the StA form, particularly by gradually increasing the use of StA cognates and unique words rather than identical words in their lexicon to prove and demonstrate sufficient language skills and master vocabulary and story listening comprehension, respectively. It is important to recognize that the language acquisition process for children in diglossic contexts like Arabic is unique and context-dependent, and cannot be simply viewed as incomplete versions of monolingual children. While the findings highlight differences in performance, these should be interpreted as part of the normal developmental trajectory for children navigating the challenges of diglossia.

In general, the results of the study point to the potential effectiveness of scaffolded storybook reading in improving children's language skills, although it is important to consider the complexity of the factors involved. These results are consistent with Vygotsky's theory of scaffolding (Vygotsky, 1978), which posits that learners benefit from structured support that is gradually withdrawn as they develop independence. The differential improvements across various stories also suggest that the gradual increase in diglossic distance within the storybooks may effectively supported the children's linguistic development, aligning with our initial hypotheses about the benefits of scaffolded learning in a diglossic context.

The findings of this study have important theoretical implications for enhancing story listening comprehension, as well as receptive and productive vocabulary in Arabic. First, it highlights the importance of the diglossic lexical-phonological distance of stories read to children in listening comprehension and vocabulary skills in Arabic. Overall, the results point to the centrality of the diglossia lexical-phonological distance categories of words in stories read to children in the early stages, i.e., the linguistic affiliation with SpA versus StA may impact linguistic processing in Arabic. Second, this study investigates the effect of teachers' storytelling lexical diglossic distance on story comprehension and receptive and productive vocabulary. Thus, the study shows that using proper storytelling at an appropriate lexical level in the classroom may help children improve their story comprehension and production abilities and create a positive attitude toward literacy. Based on the current findings, more efficient enrichment programs and greater efforts are required to expose children from preschool to gradual StA (which promotes the phonological representation of StA) oral language and enhance linguistic and comprehension measures and later school-based literacy achievement. The study suggests that the method of providing instruction and reading stories to children in Arabic has to be systematic and well-planned by teachers and might be done gradually according to the lexical phonological distance of words in the

stories. It should start from stories that include mainly SpA, move to stories that include familiar identical words represented in the mental lexicon of children, progress gradually to less familiar cognate words, and end with unfamiliar or unavailable unique words. This may minimize the lexico-phonological gap between the SpA and StA forms (Saiegh-Haddad and Everatt, 2017). This study may help Arabic language teachers to better choose the proper stories to read in their classroom routines according to lexical readability. This may help them start reading stories based on the lexical level to promote children's linguistic ability. Third, providing explicit instruction and teaching of cognate and unique StAs via storytelling at home from the early stages is also recommended. Teachers may design activities that require children to use the words they know receptively and productively. Finally, our study may encourage further research that may enrich the field of storytelling in general and language teaching–learning in Arabic.

While the study provides valuable insights into the effectiveness of the vocabulary intervention, several limitations should be noted. First, the study did not account for children's prior levels of vocabulary knowledge, which could have influenced the outcomes. Second, the design of the assessment measures included words and stories that were taught to the intervention group but not to the comparison group, potentially biasing the results. Third, the timing of the assessments for the comparison group, which were conducted in week 12, may have affected the outcomes due to the recency of exposure. Finally, there was a lack of equivalence between the intervention and comparison groups regarding teacher professional development, which could have impacted the effectiveness of the intervention.

The present study has several future directions. In this vein, Future studies should include advanced grade levels to investigate whether similar results will be obtained when the lexical-phonological distance is minimized. Future studies should include more than four stories and combinations of the StA forms. Moreover, the study focused on one town to avoid variability in the children's dialects. Thus, it is difficult to conclude the achievements of children from various dialects or regions, further studies can consider that variability. Additionally, various literacy skills, such as story retelling or production, should be addressed. Additional research should examine how diglossic lexical phonological distance features contribute to reading acquisition in the Arabic language. While this study contributes valuable insights into the role of scaffolded storybook reading in language development, the findings underscore the need for further research to untangle the complex, nonlinear relationships between lexico-phonological characteristics and children's language outcomes.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Academic Arab College of education in Israel. The studies were conducted in

accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Written informed consent was obtained from the individual(s), and minor(s)' legal guardian/next of kin, for the publication of any potentially identifiable images or data included in this article.

Author contributions

AS-k: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing –original draft, Writing – review & editing. AA-B: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. NH: Conceptualization, Data curation, Investigation, Methodology, Project administration, Writing – review & editing. AR-B: Conceptualization, Investigation, Methodology, Supervision, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Al Hadidi, A. (2010). Childrens literature, *In childhood literature.* Cairo: the Anglo Egyptian library.

Asadi, I. A., Khateb, A., Mansour-Adwan, J., and Khoury-Metanis, A. (2022). When developmental language disorder meets diglossia: a cross-sectional investigation of listening comprehension among native Arabic-speaking preschoolers. *J. Psycholinguist. Res.* 51, 1083–1099. doi: 10.1007/s10936-022-09885-5

Asadi, I. A., and Asli-Badarneh, A. (2023). The impact of diglossia-effect on reading acquisition among Arabic-speaking children: A longitudinal study. *J. Psycholinguist. Res.* 52, 1919–1937.

Asadi, I. A., Asli-Badarneh, A., Ibrahim, R., and Hamzah, H. (2024). The impact of diglossia on inflectional morphological constructions and their relation to literacy skills: A longitudinal study. *J. Speech Lang. Hear. Res.* 67, 496–510.

Asli-Badarneh, A., and Asadi, A. (2023). The impact of lexical and phonological distance on reading acquisition: The diglossic context of Arabic. *J. Res. Read.* 46, 376–392.

Asli-Badarneh, A., Hipfner-Boucher, K., Bumgardner, X. C., AlJanaideh, R., and Saiegh Haddad, E. (2023). Narrative microstructure and macrostructure skills in Arabic diglossia: the case of Arab immigrant children in Canada. *Int. J. Biling.* 27, 349–373. doi: 10.1177/13670069221077306

Badawi, E. S. (1985). "Educated spoken Arabic: a problem in teaching Arabic as a foreign language" in Scientific and humanistic dimensions of language. ed. K. R. Jankowsky (Washington, DC: Georgetown University Press), 15–22.

Boussofara-Omar, N. (2003). Revisiting Arabic diglossic switching in light of the MLF and its sub-models: the 4-M model and the abstract level model. *Biling. Lang. Congn.* 6, 33–46. doi: 10.1017/S1366728903001032

Daem, R., and Yonis, N. (2007). The language and I- an educational program for the use of the correct and rich Arabic language in kindergartens. Arabic: MosharkaThe home of Arabic child.

Davies, P., Shanks, B., and Davies, K. (2004). Improving narrative skills in young children with delayed language development. *Educ. Rev.* 56, 271–286. doi: 10.1080/0013191042000201181

Fedda, O. D., and Oweini, I. (2012). The effect of diglossia on Arabic vocabulary development in Lebanese students. *Educ. Res. Rev.* 7:351. doi: 10.5897/ERR11.022

Feitelson, D., Goldstein, Z., Iraqi, J., and Share, D. L. (1993). Effects of listening to story reading on aspects of literacy acquisition in a diglossic situation. *Read. Res. Q.* 28, 70–79. doi: 10.2307/747817

Ferguson, C. A. (1959). Diglossia. *Word* 15, 325–340. doi: 10.1080/00437956.1959.11659702

Fichman, S., Altman, C., Voloskovich, A., Armon-Lotem, S., and Walters, J. (2017). Story grammar elemfents and causal relations in the narratives of Russian-Hebrew

bilingual children with SLI and typical language development. *J. Commun. Disord.* 69, 72–93. doi: 10.1016/j.jcomdis.2017.08.001

Gagarina, N., Klop, D., Kunnari, S., Tantele, K., Välimaa, T., Balčiūnienė, I., et al. (2015). "Assessment of narrative abilities in bilingual children" in Assessing multilingual children: Disentangling bilingualism from language impairment Eds. S. Armon-Lotem, J. de Jong, N. Meir (Multilingual Matters: Channel View Publications), 243–276.

Grosjean, F. (1989). Neurolinguists, beware! The bilingual is not two monolinguals in one person. *Brain Lang.* 36, 3–15. doi: 10.1016/0093-934X(89)90048-5

Haeri, N. (2000). Form and ideology: Arabic sociolinguistics and beyond. *Annu. Rev. Anthropol.* 29, 61–87. doi: 10.1146/annurev.anthro.29.1.61

Hassona-Arafat, S. (2011). Mediation of mothers while reading a book and its contribution to child literacy in kindergarten and first grade: Evidence from the Arab family. Study for the title of "doctor of philosophy". Ramat Gan: Bar-Ilan University (Hebrew).

Hayward, D., and Schneider, P. (2000). Effectiveness of teaching story grammar knowledge to pre-school children with language impairment. An exploratory study. *Child Lang. Teach. Therapy* 16, 255–284. doi: 10.1177/026565900001600303

Hende, N. (2011). Predicting second grade reading from kindergarten language and literacy in Arabic. Study for the title of "doctor of philosophy". Tel-Aviv: Tel-Aviv University.

Hindman, A. H., Connor, C. M., Jewkes, A. M., and Morrison, F. J. (2008). Untangling the effects of shared book reading: multiple factors and their associations with preschool literacy outcomes. *Early Child. Res. Q.* 23, 330–350. doi: 10.1016/j.ecresq.2008.01.005

Ibrahim, R., Eviatar, Z., and Aharon-Peretz, J. (2007). Metalinguistic awareness and reading performance: a cross language comparison. *J. Psycholinguist. Res.* 36, 297–317. doi: 10.1007/s10936-006-9046-3

Kaderavek, J., and Justice, L. M. (2002). Shared storybook reading as an intervention context. *Am. J. Speech Lang. Pathol.* 11, 395–406. doi: 10.1044/1058-0360(2002/043)

Kawar, K., Saiegh-Haddad, E., and Armon-Lotem, S. (2023). Text complexity and variety factors in narrative retelling and narrative comprehension among Arabic-speaking preschool children. *First Lang.* 43, 355–379. doi: 10.1177/01427237221149800

Leikin, M., Ibrahim, R., and Eghbaria, H. (2014). The influence of diglossia in Arabic on narrative ability: evidence from analysis of the linguistic and narrative structure of discourse among pre-school children. *Read. Writ.* 27, 733–747. doi: 10.1007/s11145-013-9462-3

Lessard-Clouston, M. (2013). Word lists for vocabulary learning and teaching. *CATESOL J.* 24, 287–304.

Maamouri, M. (1998). Language education and human development: Arabic diglossia and its impact on the quality of education in the Arab region. The Mediterranean development forum. Washington, DC: The World Bank.

Masarweh, A., and Aram, D. (2018). "The effect of how the spoken and standard Arabic language is treated when reading a book for kindergarten children about: vocabulary acquisition from the book, understanding the plot, understanding the mental aspects of the story and reconstructing the story" in Study for the title of "doctor of philosophy" Ed. D. Aram (Tel-Aviv: University (Hebrew)).

Mol, S. E., Bus, A. G., De Jong, M. T., and Smeets, D. J. (2008). Added value of dialogic parent–child book readings: a meta-analysis. *Early Educ. Dev.* 19, 7–26. doi: 10.1080/10409280701838603

Perfetti, C., and Stafura, J. (2014). Word knowledge in a theory of reading comprehension. *Sci. Stud. Read.* 18, 22–37. doi: 10.1080/10888438.2013.827687

Ravid, D., Naoum, D., and Nasser, S. (2014) Narrative development in Arabic: story re-telling. In E. Saiegh-Haddad and R. M. Joshi (Eds.), Handbook of Arabic literacy (pp. 153–170). Literacy Studies (Perspectives from Cognitive Neurosciences, Linguistics, Psychology and Education), vol 9. Springer, Dordrecht.

Rubin, P.C., and Wilson, L. (1995). Enhancing language skills in four- and five-year-olds. Available at: http://www.cfc-efc.ca/docs/cccf/00001046.htm

Saiegh-Haddad, E. (2003). Linguistic distance and initial reading acquisition: the case of Arabic diglossia. *Appl. Psycholinguist.* 24, 431–451. doi: 10.1017/S0142716403000225

Saiegh-Haddad, E. (2012). "Literacy reflexes of Arabic diglossia" in Current issues in bilingualism: Cognitive and sociolinguistic perspectives. eds. M. Leikin, M. Schwartz and Y. Tobin (Dordrecht: Springer), 43–55.

Saiegh-Haddad, E., and Everatt, J. (2017). "Early literacy education in Arabic" in The Routledge international handbook of early literacy education. eds. N. Kucirkova, C. Snow, V. Grover and C. McBride-Chang (London: Routledge), 185–199.

Saiegh-Haddad, E., and Haj, L. (2018). Does phonological distance impact quality of phonological representations? Evidence from Arabic diglossia. *J. Child Lang.* 45, 1377–1399. doi: 10.1017/S0305000918000302

Saiegh-Haddad, E., and Henkin-Roitfarb, R. (2014). "The structure of Arabic language and orthography" in Handbook of Arabic literacy: Insights and perspectives. eds. E. Saiegh-Haddad and M. Joshi (Dordrecht: Springer), 3–28.

Saiegh-Haddad, and Joshi, M. (2014). Handbook of Arabic literacy: Insights and perspectives. Dordrecht: Springer.

Saiegh-Haddad, E., Shahbari-Kassem, A., and Schiff, R. (2020). Phonological awareness in Arabic: the role of phonological distance, phonological-unit size, and SES. *Read. Writ.* 33, 1649–1674. doi: 10.1007/s11145-020-10019-3

Saiegh-Haddad, E., and Spolsky, B. (2014). "Acquiring literacy in a diglossic context: problems and prospects" in Handbook of Arabic literacy: Insights and perspectives. eds. E. Saiegh-Haddad and M. Joshi (Cham: Springer), 225–240.

Schmitt, N. (2010). "Key issues in teaching and learning vocabulary" in Insights into non-native vocabulary teaching and learning. eds. R. Chacon-Beltran C. Albello-Contesse, and M. M. Torreblanca-Lopiz (Bristol, UK: Multilingual Matters), 28–40.

Schmitt, N. (2014). Size and depth of vocabulary knowledge: what the research shows. *Lang. Learn.* 64, 913–951. doi: 10.1111/lang.12077

Sénéchal, M., and LeFevre, J. A. (2002). Parental involvement in the development of children's reading skill: a five-year longitudinal study. *Child Dev.* 73, 445–460. doi: 10.1111/1467-8624.00417

Shahbari-Kassem, A., and Amara, M. (2022). Palestinian kindergarten teachers in Israel and Arabic education policy: language practice, ideology, and management. *Lang. Probl. Lang. Plan.* 46, 256–290. doi: 10.1075/lplp.21041.sha

Snow, C. E. (1983). Literacy and language: relationships during the preschool years. *Harv. Educ. Rev.* 53, 165–189. doi: 10.17763/haer.53.2.t6177w39817w2861

Tallas-Mahajna, N., Elhija, D. A., and Asli-Badarneh, A. (2022). Representation of Arabic narratives in Digital Media-A case study. *J. Narrat. Lang. Stud.* 10, 188–205.

Verhoeven, L., van Leeuwel, J., Irausquin, R., and Segers, E. (2016). The unique role of lexical accessibility in predicting kindergarten emergent literacy. *Read. Writ.* 29, 591–608. doi: 10.1007/s11145-015-9614-8

Vygotsky, L. S. (1978) in Mind in society: The development of higher psychological processes. eds. M. Cole, V. Jolm-Steiner, S. Scribner and E. Souberman (Cambridge, MA: Harvard University Press).