| **RESEARCH ARTICLE**

Children's Language Acquisition and Development in Saudi Arabia: A Systematic Review and Meta Analysis

Reima Al-Jarf
Full Professor of English and Translation Studies, Riyadh, Saudi Arabia
Corresponding Author: Reima Al-Jarf, **E-mail:** reima.al.jarf@gmail.com

| **ABSTRACT**

This study presents a systematic review (SR) and meta analysis (MA) of eleven articles by the author, published between 2018 and 2025, examining parental, digital, educational, and sociocultural factors that influence Saudi children's first (Arabic) and second (English) language acquisition and development. It also explores parents' beliefs about L1 and L2 learning and how these beliefs translate into practices within the home and school environments. The review synthesizes findings across four thematic clusters: parental language practices and policies (five studies), digital environments (four studies), sociocultural influences on language development (one study), and children's early decoding difficulties (one study). Results indicate that 70% of parents believe English should be taught starting from kindergarten and that early English exposure does not negatively affect Arabic acquisition. Between 50–70% of parents use a mix of Arabic and English at home, with some adopting English as the primary language of interaction. Digital findings show that the iPad is more effective for younger children (ages 1–6) than for those in grades 1–3 or 4–6. Children under six primarily used the device for learning English, with smaller proportions engaging in Arabic alphabet learning (21.88%), Quran memorization (15.6%), numeracy (12.5%), and animal vocabulary (12.5%). Sociocultural findings reveal that the effect of the housemaids' accent and inaccurate language on small children disappears once they enter kindergarten and mingle with native-speaking peers, relatives and teachers. Educational findings show that 54% of parents supported attending their children's online classes, while 54% of teachers opposed it, emphasizing the need for children to develop autonomy and self regulation. Early decoding results indicate that visual and auditory discrimination were the easiest skills, letter–sound mapping posed moderate difficulty, and sound–symbol association and structural analysis were the most challenging. Although error rates decreased with grade level, decoding weaknesses persisted. Taken together, the four clusters reveal a rapidly shifting linguistic landscape in Saudi Arabia shaped by parental beliefs, digital exposure, sociocultural patterns, and foundational L1 decoding skills. The evidence underscores the need for balanced L1–L2 development, stronger early Arabic literacy support, and informed parental and educational practices.

1. Introduction

First- (L1) and second-language (L2) acquisition by children has long attracted the attention of researchers, educators, and parents across languages and cultures. A substantial body of research has examined how schools, parents, home tutoring, the home environment, technology, books, and language-learning activities shape children's linguistic development. Numerous systematic

reviews (SRs) and meta-analyses (MAs) have synthesized this work, offering insights into the diverse factors that influence early language learning.

A major line of research focused on second language acquisition (SLA), bilingualism, and L2 outcomes. These reviews examined L2 learning processes, grammatical development, language mindsets, and theoretical perspectives, including the effect of age on L2 grammar acquisition (Qureshi, 2016), SLA frameworks (Oliver & Azkarai, 2017), language mindsets and L2 outcomes (Elahi Shirvan et al., 2024), L2 learning through play (Nguyen et al., 2024), oral-language difficulties among bilinguals (Lester et al., 2025), and factors affecting L2 comprehension (Tahir, 2023). Other reviews explored internal mechanisms underlying language acquisition, including psychological, cognitive, and developmental processes (Banaruee et al., 2023), general early acquisition patterns (Lewis et al., 2016), preterm versus full-term development (Loeffler et al., 2025), gender differences (Marjanovič-Umek & Fekonja-Peklaj, 2017), and children's linguistically-based social preferences (Spence et al., 2021).

A second line of SRs and MAs studies highlighted the central role of the home environment including caregiver input. These studies showed that parental linguistic input is a strong predictor of children's language development. Evidence from home literacy environments (Dong & Chow, 2022; Nag et al., 2024; Zhang, Lau & Su, 2023), family and school environments (Carvalho et al., 2016), peer interactions (Washington-Nortey et al., 2022), nature-based learning environments (Richardson et al., 2024), home-visiting programs (Henwood et al., 2020), and caregiver speech and interaction quality (Coffey & Snedeker, 2025; Dagan et al., 2024) demonstrates that rich, varied, and contingent linguistic input supports conversational skills, vocabulary growth and syntactic development. Additionally, parental responsiveness, interactional quality, emotional climate, and attachment relationships also predict expressive and receptive language development.

A third group of SRs and MAs examined school-based instruction, teacher talk, and intervention programs. These included analyses of teacher language practices (Jiang et al., 2025), instructional approaches for minority learners (Silburn et al., 2011), early literacy interventions for dual-language learners (Hur et al., 2020), and bilingual and home-language interventions (Durán et al., 2016). Additional reviews highlight the role of vocabulary learning, play-based approaches and structured games (Mohamed & Shaaban, 2021; Pradheepa et al., 2025; Nguyen et al., 2024), as well as assessments of early language milestones and L1 acquisition frameworks (Salehuddin & Mahmud, 2024; Wulansari & Nida, 2020).

A fourth line of research investigates digital media, technology, and mobile learning. These studies examine the effects of mobile applications (Booton et al., 2023; Mavi & Erbay, 2021), gamification (Dehganzadeh & Dehganzadeh, 2020), technology-assisted vocabulary learning (Şimşek & Şimşek, 2025), CALL environments (Macaro et al., 2012), e-books (Zhang et al., 2020), immersive technologies (Weng et al., 2024), and adult–child co-use of digital media (Taylor et al., 2024). Collectively, these reviews show that digital tools can support language development when content is high-quality and adult mediation is present.

Taken together, the above literature converges on several key conclusions: (i) parental linguistic input is a robust predictor of children's language outcomes; (ii) home literacy environments—particularly shared reading and access to print and digital materials—play a central role in vocabulary growth and early literacy; (iii) digital media can either support or hinder language development depending on content quality and the degree of parental involvement; and (iv) sociocultural and environmental factors shape the opportunities children have for acquiring and using language.

Despite the breadth of existing SRs and MAs on children's language acquisition globally, significant gaps remain - especially regarding L1 (Arabic)–L2 (English) bilingual development and the sociocultural realities of families in Saudi Arabia. Most SR/MAs focus on Western, English-dominant populations, monolingual English-speaking children, or early literacy and digital media interventions in Western households. Consequently, they do not capture the linguistic, educational, and cultural dynamics of Arabic–English bilingual environments, nor the unique patterns of language socialization within Saudi society.

The present review revealed that no comprehensive SR or MA has synthesized evidence on how Saudi parents support Arabic and English at home, how digital tools influence bilingual development, how domestic helpers shape children's early Arabic acquisition, or how home literacy environments function in bilingual households. Regional reviews tend to address English teaching strategies or general educational issues rather than children's bilingual development, leaving the home-based and sociocultural dimensions of language acquisition largely unexplored. To address this gap, the current study aims to conduct a systematic review and meta-analysis of eleven articles by the author, published between 2018 and 2025, examining parental, digital, educational, and sociocultural factors that influence Saudi children's first (Arabic) and second (English) language acquisition and development. This SR and MA, therefore, provides a context-specific understanding of how parents, home environments, and digital tools jointly shape children's linguistic trajectories in the Saudi context.

This study is significant because it represents the first SR and MA focused specifically on L1 and L2 acquisition among children in Saudi Arabia. No prior review has integrated Saudi empirical studies into a unified analytical framework that brings together parental practices, digital exposure, home literacy, and caregiver influences, nor has any conducted a meta-analysis of effect sizes derived from Saudi-based research. The author's eleven studies offer a coherent dataset with consistent themes, comparable methodologies, and a culturally grounded lens—making a meta-analytic synthesis both feasible and necessary.

By synthesizing a single researcher's comprehensive program of work on Saudi children's L1 and L2 development, this review avoids the heterogeneity typical of multi-author reviews and achieves a level of internal coherence and methodological consistency rarely possible in broader syntheses. It fills a gap by integrating evidence on how Saudi parents, home environments, and digital technologies influence children's Arabic and English development, offering a regionally grounded and methodologically rigorous contribution to the global literature on child language acquisition.

The studies included in this SR and MA do not cover all aspects of children's language acquisition, because it is a very broad field. Instead, the studies deliberately focus on issues that have become increasingly salient in the Saudi context - particularly the parental prioritization of early English exposure alongside the assumption that Arabic will develop naturally without support. The included studies were conducted because they illuminate these emerging attitudes and allow for a critical examination of how they align with, or diverge from, established research on L1 and L2 acquisition and development.

Finally, this study is part of an ongoing series of SR and MA papers by the author, which already includes a systematic review and meta-analysis of 2024–2025 research on AI Arabic translation, linguistics, and pedagogy (Al-Jarf, 2026), further contributing to a sustained program of scholarship on language acquisition and linguistic development in the Arab world.

2. Methodology

2.1 Study Corpus

The present SR and MA is based on eleven research articles by the author published between 2018 and 2025. The articles examine parental, social, digital, and educational factors that influence Saudi children's first and second language acquisition and development. They explore parents' beliefs about first (L1) and second (L2) language acquisition and how these beliefs are translated into actions and practices within the home. Together the eleven studies provide a rich, coherent dataset for both quantitative and qualitative synthesis. They fall into four thematic clusters as follows:

Cluster 1: Parental Language Practices and Home Language Policies

This cluster examines how parents' beliefs, motivations, and home language policies shape children's L1 and L2 development. It includes the following studies: Why some Arab parents speak to their children at home in English (L2) (Al-Jarf, 2025); mothers' views on learning English by kindergarten children in Saudi Arabia (Al-Jarf, 2023c); parents' views on English language education at the elementary school level (Al-Jarf, 2022c); how parents promote English and Arabic language proficiency in elementary school children (Al-Jarf, 2022e); and should English be taught to children under the age of six? (Al-Jarf, 2020). Together, these studies explain why parents choose English, how they support L1 and L2 development, and how early English exposure is managed within Saudi households.

Cluster 2: Digital Environment & Technology-Mediated Language Acquisition
This cluster focuses on digital media, online learning, and mobile devices and how they influence bilingual development. It includes the following studies: Digital reading among children in Saudi Arabia (Al-Jarf, 2023a); parental attendance of children's online classes (Al-Jarf, 2022g); differential effects of the iPad on first and second language acquisition during the pandemic (Al-Jarf, 2021b); and impact of the iPad on Saudi young children in the home environment (Al-Jarf, 2021e). These studies focus on digital tools (iPads, digital reading platforms, and online classes), and their impact on children's L1 and L2 development.

Cluster 3: Sociocultural & Caregiver Influences on Language Development
This cluster sheds light on the role of multilingual housemaid dynamics. It includes the following study: The influence of housemaids on Saudi young children's Arabic (L1) language acquisition (Al-Jarf, 2022i). It examines non-parental influences and sociocultural factors affecting children's Arabic acquisition, i.e., housemaids, home environment, sociocultural dynamics. Although represented by a single study, this cluster addresses a distinct sociocultural factor—the linguistic influence of house maids - absent from the other studies. It highlights how multilingual household dynamics shape children's Arabic acquisition.

Cluster 4: Children's Linguistic Outcomes & Early Language Difficulties
This cluster explored early literacy and decoding challenges in Arabic. It includes one study: First, second and third grade students' word identification difficulties (Al-Jarf, 2018). This study focuses on children's actual language performance, independent of parental or digital factors and provides insight into decoding challenges in Arabic.

2.2 Eligibility (Inclusion & Exclusion) Criteria
2.2.1 Inclusion Criteria

To be included in the corpus, studies had to meet the following criteria: (i) Authorship, i.e., the study must be authored by Reima Al-Jarf. (ii) Publication period, i.e., the study must have been published between 2018 and 2025. (iii) Content focus, i.e., the study must examine parental, social, digital, or educational factors affecting Saudi children's first and/or second language acquisition and development. (iv) Data requirements, i.e., the study must contain extractable quantitative or qualitative data suitable for synthesis.

Because the purpose of this SR/MA is to synthesize the author's entire research program on Saudi children's language acquisition during a controlled eight-year period, the dataset is closed and predefined. All eligible studies are already publicly available across major academic platforms (Google Scholar, ResearchGate, Academia, SSRN, Semantic Scholar, Scopus, and others). Therefore, an external database search was methodologically unnecessary, as no additional studies outside this corpus could meet the inclusion criteria.

2.2.2 Exclusion Criteria

Studies were excluded if they were published before 2018, did not focus on Saudi children's language acquisition, examined elementary school reading textbooks, literacy and reading programs, or EFL reading at the secondary or college level, focused on adult reading habits, or addressed foreign literacy promotion programs unrelated to Saudi children. Therefore, the following studies by the author were excluded:

A. ***Studies on children's language development published before 2018***, e.g., developing reading and literacy skills in Saudi Arabia (Al-Jarf, 2007b); Arabic websites for pre-school children (Al-Jarf, 2004a).

B. ***Studies on elementary reading textbooks and reading skills (not language acquisition)***, *e.g.,* reading lesson design in junior and senior high school reading textbooks in Saudi Arabia (Al-Jarf, 2003); advance organizers in elementary, junior and senior high school reading textbooks in Saudi Arabia (Al-Jarf, 2001a); cohesion skill instruction (Al-Jarf, 2001b); context analysis skills instruction (Al-Jarf, 2001c); study skills instruction... (Al-Jarf, 2001d); text structure instruction (Al-Jarf, 2002); an Arabic word identification diagnostic test... (Al-Jarf, 1995); classification of word identification exercises (Al-Jarf, 1992); classification of reading comprehension questions (Al-Jarf, 1989b); a model for a reading lab for Saudi students (Al-Jarf, 1989a).

C. ***Studies on high-school or college reading instruction in Arabic*** as preparing high school students for the university and life after graduation (Al-Jarf, 2023f); quality in teaching reading to high school students (Al-Jarf, 2019); a proposed model of quality criteria for preparing secondary school students for university studies (Al-Jarf, 2007b).

D. ***Studies on adult reading practices, interests, and habits*** as reading habits and motivation among educated Arabs... (Al-Jarf, 2023c); favorite magazines and reading topics among Saudi female college students (Al-Jarf, 2023e); digital reading among educated Arabs (Al-Jarf, 2023b); educated Arabs' reading interests before, during and after the pandemic (Al-Jarf, 2022b); reading interests of university female students in Saudi Arabia (Al-Jarf, 2022h); examples of successful literacy campaigns in the world (Al-Jarf, 2005); reading promotion programs in South Korea (Al-Jarf, 2005a), what college students read in the globalization era (Al-Jarf, 2004d; Al-Jarf, 2004e); Al-Jurf, 2004f).

E. **Studies on EFL learning and reading development among college students** as developing students' global awareness in EFL reading and speaking (Al-Jarf, 2022a); enhancing EFL students' reading and appreciation skills with mobile fiction apps (Al-Jarf, 2022d; Al-Jarf, 2022f); collaborative mobile eBook reading for struggling EFL readers (Al-Jarf, 2021a); enhancing EFL freshman students' reading skills with inspirational quotes (Al-Jarf, 2021c); how much material do EFL college instructors cover... (Al-Jarf, 2021d); testing reading for specific purposes... (Al-Jarf, 2021g); teaching reading with mind-mapping software (Al-Jarf, 2021f); teaching reading online (Al-Jarf, 2019b); enhancing reading and speaking skills through Multicultural Children's Short Stories (Al-Jarf, 2015); integrating Elluminate in EFL reading instruction (Al-Jarf, 2014); enhancing freshman students' performance with online reading and writing activities (Al-Jarf, 2013); developing and testing reading skills through art texts (Al-Jarf, 2011); enhancing EFL students' reading skills with online videos (Al-Jarf, 2010a); integrating RCampus in college reading and writing (Al-Jarf, 2010b); maximizing ESL freshman readers' skill with online instruction (Al-Jarf, 2009a); promoting EFL secondary students' extensive reading skills (Al-Jarf, 2009b); teaching extensive reading online (Al-Jarf, 2009c).

F. **Studies about using English as a medium of instruction at the college level** as the impact of English as an international language (EIL) upon Arabic in Saudi Arabia (Al-Jarf, 2008); college students' attitudes towards using English and Arabic as a medium of instruction at the university level (Al-Jarf, 2004b; Al-Jarf, 2004c; Al-Jarf, 2004d; Al-Jarf, 2004e; Al-Jarf, 2004f).

2.3 *Corpus Characteristics*
The diversity of the corpus is methodologically justified by the multidimensional nature of the factors influencing Saudi children's L1 and L2 learning. The eleven studies intentionally examine parental, educational, digital, and sociocultural factors of L1 and L2 development. Although the studies vary in focus, they collectively address complementary aspects of the same language acquisition phenomenon. To ensure methodological coherence, the studies were organized into four thematic clusters, with quantitative outcomes synthesized within clusters and qualitative findings integrated through narrative synthesis.

2.4 *Information Sources*
All studies included in the corpus come from the author's own publication record. They are centralized, publicly accessible, and consistently indexed across major academic platforms, including Google Scholar, ResearchGate, Semantic Scholar, SSRN, Academia, Harvard Library, and - where applicable - Scopus. Because the corpus represents a closed and complete research program, no external database search was required.

To control for intervening variables in a way that typical SR/MAs cannot achieve, all eleven studies were conducted within the same 2018–2025 time period. Restricting the corpus to this eight-year period ensures methodological consistency, as long-span reviews often combine studies produced under different educational policies, technological conditions, and research paradigms, which can lead to unstable or incomparable effect sizes. By contrast, the present corpus reflects a coherent set of studies conducted under similar contextual and methodological conditions.

2.5 *Study Design*
This study adopts a systematic review design following the PRISMA principles (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The review synthesizes a closed, predefined corpus consisting of all studies authored by Al-Jarf between 2018 and 2025 that examine factors influencing Saudi children's L1 and L2 acquisition and development. Because the corpus is complete and bounded, the review process follows the standard PRISMA components of eligibility criteria, study selection, data extraction, and quality assessment.

2.6 *Data Extraction*
From each study, the following information was extracted: (i) Sample characteristics: sample size, participant demographics (e.g., percentage of mothers and fathers, parental education levels), and children's age distribution (early, middle, late childhood), as well as study context. (ii) Linguistic domain: the specific aspect of language examined (e.g., L1/L2 proficiency, digital reading, word identification). (iii) Research context and design: setting, methodological approach, and analytical procedures. (iv) Research instruments: surveys, interviews, tests, observational tools, or digital-usage measures. (v) Child tasks: the type of linguistic or cognitive task children were required to perform. (vi) Outcome measures: proportions and accuracy scores (e.g., percentage of parents or teachers reporting specific behaviors, or those who accept or reject something), performance indicators, and error counts in reading or word-identification tasks. These extracted variables allowed for quantitative synthesis within clusters and narrative integration of qualitative findings.

2.7 *Quality Assessment*
The included studies were evaluated for methodological consistency, clarity of outcome measures, and comparability across the corpus. Most studies used similar research instruments, vis survey and interviews, which were conducted within the same time window which facilitated cross-study comparison. All studies reported clear outcome measures and demonstrated acceptable methodological rigor, with no major design flaws identified. Because all eleven studies were conducted by the same researcher within a controlled period (2018–2025), the risk of methodological heterogeneity was minimal.

2.8 *Meta-analysis Procedures*
The meta-analysis employed proportion-based effect sizes expressed as percentages, an appropriate metric for studies reporting percentage agreement, accuracy rates, error counts, recognition success, and decoding success, and. A random-effects model was used to pool results across studies, and heterogeneity was assessed using the Q statistic and I^2 statistic. A mixed-methods synthesis was conducted: Quantitative meta-analysis was applied to proportion-based outcomes (e.g., parental stances, accuracy measures, error rates) & narrative synthesis was used for qualitative findings, including parents' rationales, beliefs, and explanatory comments. Where relevant, subgroup analyses were performed—for example, by type of word-identification error or categories of housemaids' mispronunciations. Calculations were carried out using manual computation, Excel, and SPSS, depending on the structure of each dataset. Because all eleven studies included studies were descriptive and reported proportion-based, accuracy-based, error-based, recognition-based, or decoding-based outcomes, proportions served as the unified effect size across

analyses. This approach aligns with established standards for meta-analyses synthesizing parental and teacher reports as well as children's performance measures.

2.9 *Data Synthesis*
Data synthesis followed a mixed-methods approach integrating both quantitative and qualitative analyses. Studies reporting numerical results were summarized descriptively, then prepared for meta-analysis using proportion-based effect sizes. Studies reporting qualitative findings were synthesized narratively and grouped according to the four thematic clusters identified in the corpus. Finally, quantitative and qualitative results were integrated to provide a comprehensive, multidimensional profile of the factors influencing Saudi children's language acquisition and development across the four thematic domains.

2.10 *PRISMA Flow Description*
The number of records identified corresponds to the full set of eleven studies on factors affecting Saudi children's language acquisition and development produced by the author between 2018 and 2025. These records were obtained from the author's publication list and verified across multiple academic platforms, including Google Scholar, ResearchGate, Academia, Semantic Scholar, SSRN, and Scopus. Because the corpus is predefined and closed, all eleven records were screened, and each study was confirmed to focus on Saudi children's first and/or second language acquisition and development. All studies met the inclusion and eligibility criteria. Accordingly, all eleven studies were included in the final synthesis.

3. Results

3.1 Overview
This subsection presents the findings of the eleven studies included in the SR and MA, organized into four thematic clusters that reflect the major domains influencing Saudi children's acquisition and development of their L1 and L2. The clusters address: (1) Parental beliefs, practices, and home language environment, (2) Digital environment and technology-mediated language acquisition, (3) Sociocultural and caregiver influences on language development, and (4) Children's linguistic outcomes and early language difficulties. Each cluster synthesizes the quantitative accuracy measures, error rates, and qualitative patterns reported in the original studies. The results presented in this section are descriptive and reflect the empirical findings of the studies included herein without interpretation, critique, or theoretical evaluation.

3.2 Study Characteristics
The eleven studies included in this review examine a wide range of factors influencing Saudi children's acquisition and development of their first and second languages. The studies vary in sample size, encompassing parents, teachers, and children across multiple age groups and grade levels, as well as diverse sets of test items and linguistic tasks. The results include: (1) percentages of parents' and teachers' attitudes and practices; (2) percentages of children's correct, partial, and faulty responses in language and literacy tasks, and (3) qualitative analyses of semantic, syntactic, pragmatic, and culturally influenced error types. Collectively, these studies provide a rich and heterogeneous dataset that captures parental and teacher views, children's linguistic preferences, and their performance across different developmental stages and learning contexts.

3.2.1 Cluster 1: Parental Beliefs, Practices, and Home Language Environment
Across the five studies in the parental cluster, consistent patterns emerged regarding parents' beliefs about early English learning, home language practices, and children's L1/L2 proficiency. The majority of parents - around 70% - believed that English should be introduced in kindergarten or earlier, and that early exposure has no negative effect on Arabic acquisition. Between 50–70% of parents reported using a mix of Arabic and English at home, with some households adopting English as the primary language of interaction, especially when children attended international schools or had previously lived abroad.

Parents' reasons for promoting English were largely academic, pragmatic, and social, ensuring future educational success, improving pronunciation and vocabulary, facilitating communication with foreign housemaids, and viewing English as a marker of prestige and high social class. Several studies documented misconceptions, including the belief that weakness in English among older students is due solely to starting English instruction in grade 7, and that early English exposure automatically leads to native-like pronunciation.

Across school types, clear proficiency patterns emerged. Children in international schools were consistently rated as stronger in English than Arabic, with many showing limited Standard Arabic proficiency and relying primarily on English or Colloquial Arabic in daily communication. In private schools, Arabic remained stronger for about 62.5% of children, while 37.5% were stronger in English. In public and Quranic schools, Arabic was universally the dominant and preferred language. Parents' ratings of children's English proficiency varied by school type, ranging from excellent (39%) in private schools to poor (25%) in public schools.

Home-based language promotion practices were diverse. Parents commonly encouraged children to watch English cartoons (39%), use English educational apps (33%), read books (22%), or enroll in holiday English courses (17%). A smaller proportion (5%) encouraged online interaction with native speakers or English gaming. To support Arabic, some parents hired tutors (20%) or required daily reading of Quranic and Standard Arabic materials (50%).

Overall, the parental cluster reveals a strong societal shift toward early English prioritization, mixed home language practices, and persistent misconceptions about bilingual development. These patterns contribute directly to children's L1/L2 balance and form a foundational component of the broader thematic synthesis.

3.2.2 Cluster 2: Digital Environment & Technology-Mediated Language Acquisition (Results Summary)

Across the three studies in this cluster, clear patterns emerged regarding Saudi children's engagement with digital devices and the impact of technology on their first and second language development. The iPad was consistently found to be more effective for younger children (1–6 years) than for older children in grades 1–3 and grades 4–6. Children under six used the iPad primarily for learning English, with smaller proportions using apps for Arabic alphabet learning (21.88%), Quran memorization (15.6%), numeracy (12.5%), and animal vocabulary (12.5%). Interactive features such as animation, audio, and color supported early vocabulary, alphabet, and concept learning. In contrast, older children used the iPad mainly for games, movies, and entertainment, with limited educational engagement.

Parents' perceptions reflected both enthusiasm and concern. About 50% of young children owned their own iPad, and half used it 1–2 hours daily, while 74% of mothers viewed the device as a modern necessity that keeps children occupied and facilitates quick learning. However, mothers also reported negative effects, including distraction, social isolation, irritability, reduced physical activity, and potential eye strain. Many noted behavioral dependence on the device and recommended time limits and parental supervision, though they disagreed on the optimal age for iPad use.

Digital reading patterns showed similarly age and grade differences. All children used smartphones for apps, games, and YouTube, while 41% used tablets and none used e-readers. Children under six enjoyed reading letters and words on touch screens, whereas 64% of children in grades 1–3 and most in grades 4–6 used devices primarily for entertainment rather than reading. Older children perceived educational apps as boring, and about half of parents did not supervise digital reading at any stage (before, during, or after the pandemic). Despite widespread device use, both parents and children continued to prefer print books, and advanced digital reading tools (audiobooks, interactive story apps, online book clubs) were rarely used.

Overall, the digital cluster reveals a strong reliance on mobile devices for early L2 exposure, limited digital engagement with Arabic reading among older children, and persistent gaps in parental supervision and digital literacy. These patterns highlight the need for structured integration of digital reading and language apps into the curriculum and for greater parental awareness of technology-mediated language learning.

3.2.3 Cluster 3: Sociocultural & Caregiver Influences on Language Development

Findings from this cluster highlight the significant yet largely temporary influence of foreign housemaids on Saudi children's early Arabic language (L1) development. Across a sample of 300 mothers with children under six, most housemaids were reported to arrive in Saudi Arabia speaking neither Arabic nor English, with 87% speaking only their native language, 10% speaking some English, and only 3% having prior Arabic exposure. Housemaids typically acquire colloquial Arabic through immersion. Their speech is characterized by mispronunciations, grammatical errors, incomplete sentences, and limited vocabulary. Mothers reported that these inaccurate speech features are often imitated by young children, especially between the ages of two and three when they first begin speaking. Approximately 80% of children always or sometimes imitate the housemaid's pronunciation, 53% imitate her vocabulary, and 42% imitate her grammatical structures. A smaller proportion use unintelligible words (20%) or rely on gestures and sign-like communication (22%). About 12% of children were reported to show language disorders, though the study does not attribute causation. Despite these early influences, mothers consistently noted that the inaccurate pronunciation effects are temporary. Once children enter kindergarten and are exposed to native-speaking peers and teachers, traces of the housemaid's accent and grammatical patterns disappear, and children develop native-like Arabic proficiency. This suggests that the housemaid's influence is strongest during the earliest stages of language emergence and diminishes as children gain broader linguistic input. The degree of influence appears to depend on three sociocultural factors: Time spent with the housemaid, time spent with the mother, and the presence of siblings or playmates who provide alternative language models.

The housemaids' own Arabic proficiency improves over time: after one year, 52% have somewhat intelligible speech, and after two years, 66% reach good to excellent spoken proficiency. However, they do not learn to read or write Arabic, and their speech remains colloquial rather than standard.

Overall, this cluster reveals that while foreign caregivers shape early phonological and lexical patterns, their influence is developmentally limited and mediated by family dynamics, exposure to native speakers, and entry into formal schooling.

3.2.4 Cluster 4: Children's Linguistic Outcomes and Early Language Difficulties

Studies in this cluster examined children's linguistic performance, early reading and decoding difficulties, and the role of parents' involvement in online learning. Together, they provide a detailed account of the challenges Saudi children face in basic language skills and the socio-pedagogical factors that shape their acquisition.

The study on parental attendance of online classes indicated that 54% of the parents favored attending their children's online classes - especially for younger learners, whereas 54% of the teachers opposed it, arguing that children need opportunities to develop autonomy, responsibility, and self-regulation. Both groups agreed that parents play essential academic roles during online learning as organizing the learning environment, monitoring attention, motivating the children, and assisting with technical issues. However, they also agreed that parental intervention should be limited to cases involving platform difficulties, connectivity problems, assignment submission issues, or learning disabilities, rather than routine academic participation.

The second study provided a comprehensive analysis of word identification difficulties in L1 among first-, second-, and third-grade students. Across all grade levels, the easiest sub-skills were visual discrimination, auditory discrimination, and recognizing words as whole units or in context. Letter recognition was moderately difficult, while the most challenging sub-skills were sound–symbol association and structural analysis. Error patterns decreased systematically with grade level, indicating developmental improvement: first graders consistently showed the highest error rates, followed by second graders, with third graders performing best across all sub-skills. Median-based analyses revealed specific areas of difficulty in decoding skills in L1. First graders struggled with 66% of items in the overall test, including high error rates in word recognition as a unit (74%) and structural analysis (100%). Second graders showed substantial difficulty in written-sound association (96%) and letter-sound association (54%), while third graders continued to struggle with letter-sound mapping (54%) and written-sound association (45%). Detailed analyses of sub-skills - such as handling المقصورة الألف alif maqṣūra, letter merging, الهمزة hamza writing, التنوينtanwīn, and omitted letters - showed that all three grades exhibited varying degrees of difficulty, with the most persistent challenges appearing in connecting written words with their pronunciation and structural analysis. Across grades, a consistent pattern emerged: Easiest skills: visual discrimination → auditory discrimination → word recognition (unit/context), Moderate difficulty: connecting written letters with corresponding sounds and the most difficult is connecting written words with pronunciation → structural analysis. These findings highlight the need for targeted early-grade interventions focusing on phonological awareness, sound–symbol associations, and morphological and structural analysis skills.

Overall, Cluster 4 demonstrates that children's L1 and L2 acquisition are shaped by both instructional environments (e.g., online learning dynamics) and basic reading skills in L1 (e.g., discrimination, decoding, structural analysis). This cluster provides strong evidence that early reading difficulties in L1 are systematic, predictable, and responsive to grade-level progression, but require explicit instructional strategies to prevent long-term reading challenges.

4. Discussions

4.1 Parents Attitudes Across Studies

Across the studies included in this review, parents consistently expressed strong support for early English exposure and technology-mediated learning, while simultaneously valuing the preservation of Arabic as the children's first language. In the parental cluster, the majority of parents believed that English should be introduced in kindergarten or earlier, and many viewed early exposure as essential for future academic success, global communication, employment and social mobility. Parents frequently associated English with prestige, better schooling opportunities, and enhanced pronunciation and vocabulary, reflecting broader sociocultural expectations surrounding L2 proficiency in Saudi Arabia.

At home, parents reported using a mix of Arabic and English, with a substantial percentage adopting English as a regular medium of interaction - particularly in families with children enrolled in international schools or with prior exposure to English-speaking environments. Parents also played an active role in promoting English through digital apps, cartoons, educational games, and reading materials, while relying on the reading of the Quran, private tutors, and structured activities to promote Arabic.

Parents' attitudes toward technology were similarly positive. Many perceived the iPad and other touch-screen devices as necessary tools for modern learning, especially for younger children who were seen as quick and enthusiastic learners in digital environments. At the same time, parents expressed concerns about overuse, addiction, social withdrawal, and reduced physical activity, recommending time limits and supervision to balance benefits and risks.

During online learning, parents acknowledged their responsibility in organizing, facilitating and monitoring their children's participation, particularly younger ones. However, they also recognized the importance of allowing children to develop autonomy, self-regulation and responsibility, echoing teachers' concerns about excessive parental involvement.

Overall, parents across studies demonstrated a combination of high aspirations, pragmatic decision-making, and protective concerns. Their attitudes reflect a broader societal shift toward early mastery of L2 (English), digital learning, and active parental engagement, while also highlighting tensions between supporting English development and safeguarding children's linguistic, social, and behavioral well-being.

4.2 Why Parents Favor English

Across the reviewed studies, parents consistently expressed strong and multifaceted motivations for prioritizing English in their children's early linguistic environment. A dominant conception/stereotype of English as a gateway to academic success, with many parents believing that early exposure enhances children's readiness for school, improves pronunciation and vocabulary, and provides a competitive advantage in later educational stages. Parents frequently associate English proficiency with high-quality schooling, particularly in private and international schools where English is used as a medium of instruction.

Beyond academic reasons, parents viewed English as a social and economic asset. Many believed that English facilitates communication in an increasingly globalized society, supports future employment opportunities, and is a sign of social prestige. For some families, English also served practical functions in daily life, such as communicating with foreign housemaids or accessing digital content, apps, and entertainment as most of which are available primarily in English.

Parents' preference for English was further reinforced by children's positive engagement with digital media. Studies showed that young children learn English quickly through interactive apps, cartoons, games, and online content, which parents interpreted as evidence of the effectiveness of early English exposure. This perception strengthened the belief that English learning is both natural and beneficial in early childhood.

At the same time, parents did not view English as replacing Arabic but rather as a necessary addition to their children's linguistic repertoire. Many expressed confidence that Arabic would remain stable through school instruction, reading of the Quran, and family interaction, while English required deliberate early support to ensure proficiency.

Overall, parents favored English (L2) because they perceived it as academically advantageous, socially valuable, and practically useful in both home and school contexts. Their attitudes reflect broader societal expectations surrounding bilingualism and the growing role of English in children's digital and educational environments.

These findings are echoed in real-life cases observed among Saudi families. For example, children enrolled in international schools often speak English fluently and even write creative stories in English, yet struggle to produce comparable texts in Arabic. In one case, a child wrote a Harry Potter–inspired story in English but cannot write a single paragraph in Arabic. Another student, now studying medicine, reports difficulty expressing basic medical concepts in Arabic, relying entirely on English even in informal communication on WhatsApp. These examples illustrate the long-term consequences of early English prioritization and the marginalization of Arabic, which - unlike English - requires intentional learning, practice and support during early childhood to ensure full proficiency.

4.3 Meta-Conclusion

Across the eleven studies included in this SR and MA, a coherent picture emerges regarding the factors influencing Saudi children's acquisition and development of their first and second languages. Despite the diversity of methodologies, age groups, and contexts, the findings converge on several overarching themes. First, parents play a central role in shaping children's early linguistic environments. Their strong preference for early English exposure - driven by academic aspirations, social mobility, and digital engagement - coexists with a parallel commitment to maintaining Arabic through school instruction, Quranic reading, and family interaction. This dual orientation reflects a broader societal shift toward early mastery of both L1 and L2, where English is viewed as an essential skill rather than a replacement for Arabic.

Second, children's digital environments significantly influence their language experiences. Younger children benefit from interactive apps and touch-screen devices that support early vocabulary and concept learning, particularly in English. However, older children tend to use digital devices primarily for entertainment, resulting in limited engagement with educational or Arabic-focused content. Parents recognize both the benefits and risks of exposure to digital devices, expressing enthusiasm for their learning potential while voicing concerns about overuse, distraction, and reduced social interaction.

Third, sociocultural dynamics - particularly the presence of foreign housemaids - shape early Arabic language development in complex ways. While many children temporarily imitate the housemaid's pronunciation and grammatical patterns, these influences decrease once children enter kindergarten and receive sustained exposure to native-speaking peers and teachers. This pattern underscores the resilience of L1 development when supported by rich linguistic input.

Finally, children's linguistic outcomes reveal systematic patterns of difficulty in foundational literacy skills. Across grades, visual and auditory discrimination emerge as the easiest skills, while sound–symbol association, written-sound mapping, and structural analysis present persistent challenges. These findings highlight the need for targeted early-grade interventions to strengthen decoding and morphological awareness.

Taken together, the four clusters demonstrate that Saudi children's L1 and L2 development is shaped by an interplay of parental beliefs, digital exposure, sociocultural caregiving environments, and core linguistic processing skills. The studies collectively emphasize the importance of early, balanced, and developmentally appropriate support for both Arabic and English, while also pointing to areas where instructional and parental practices can be strengthened to promote more robust bilingual development.

4.4 Meta-Interpretation.

Taken together, the findings across the eleven studies reveal a multilayered and interdependent system shaping Saudi children's L1 and L2 development. The patterns observed across clusters suggest that children's linguistic outcomes cannot be attributed to a single factor; rather, they emerge from the interaction of parental beliefs, digital exposure, caregiver input, and core linguistic processing skills. These domains reinforce and sometimes counterbalance one another, producing a dynamic bilingual environment with both opportunities and vulnerabilities.

A central interpretation is that parents act as primary architects of children's early linguistic experiences. Their strong preference for early English exposure—motivated by academic aspirations, global mobility, and digital engagement—creates an environment where English is introduced early and often through technology, schooling choices, and home practices. At the same time, parents assume that Arabic will remain stable through school instruction and religious practices, which may lead to asymmetrical support for the two languages. This imbalance helps explain why children in international and private schools often show stronger English than Arabic, while children in public and Quranic schools maintain Arabic dominance.

Digital environments amplify these patterns. For younger children, interactive apps and touch-screen technologies provide rich, engaging input that accelerates early English vocabulary and concept learning. However, as children grow older, their digital use shifts toward entertainment, reducing exposure to educational content and limiting opportunities for Arabic literacy development. This shift suggests that technology is not inherently beneficial or harmful, but its impact depends on age, supervision, and the type of content accessed.

Sociocultural caregiving factors - particularly the presence of foreign housemaids - introduce additional layers of linguistic input. While young children often imitate the housemaid's pronunciation and grammar, these effects are temporary and fade once children enter kindergarten. This pattern highlights the plasticity and resilience of early L1 development when children receive sustained exposure to native speakers. It also underscores the importance of input quality, showing that children can recalibrate their phonological and grammatical systems when provided with richer linguistic environments.

Finally, the studies on children's linguistic performance reveal systematic developmental trajectories. The consistent difficulty with sound–symbol association, written-sound mapping, and structural analysis suggests that these areas represent core bottlenecks in early literacy acquisition. These findings align with broader research showing that phonological awareness and morphological processing are foundational for reading development in alphabetic languages, including Arabic. The persistence of these difficulties across grades indicates a need for more explicit, structured instruction in these areas.

4.5 *Cross-Cutting Insights*

Several cross-cutting insights emerge when the findings of the four thematic clusters are viewed collectively. Although each cluster focuses on a distinct domain—parental practices, digital environments, sociocultural caregiving, and children's linguistic performance—the studies reveal interconnected patterns that shape Saudi children's L1 and L2 development in complementary ways.

A first cross-cutting insight is the centrality of input quality and quantity across all contexts. Whether the input comes from parents, digital devices, or caregivers, children's linguistic outcomes consistently reflect the nature of the language they are exposed to. Rich, structured, and developmentally appropriate input - such as parental reading, supervised digital learning, or interaction with native-speaking peers - supports stronger L1 and L2 development. Conversely, unstructured or low-quality input, such as unsupervised screen time or early imitation of non-native caregivers, tends to produce temporary inaccuracies or persistent weaknesses in foundational skills.

A second insight concerns the interaction between home practices and school environments. Parents' strong preference for early English exposure, combined with children's heavy engagement with English-dominant digital content, creates an early linguistic tilt toward English. School type then amplifies or counterbalances this tilt: international and private schools reinforce English dominance, while public and Quranic schools strengthen Arabic. This pattern suggests that children's bilingual trajectories are shaped by a home–school continuum, rather than by either environment alone.

A third cross-cutting theme is the developmental sensitivity of language learning. Younger children benefit more from interactive digital tools, imitate caregivers more readily, and show rapid shifts in pronunciation and vocabulary based on their immediate environment. As children grow older, their digital use becomes more entertainment-oriented, their linguistic systems stabilize, and their difficulties shift toward deeper cognitive-linguistic processes such as sound–symbol mapping and structural analysis. This highlights the importance of timing: early exposure shapes surface-level features, while later development depends on explicit instruction and literacy support.

A fourth insight is the consistency of parental influence, even in domains where parents are not directly teaching language. Parents choose school types, shape device access, regulate digital content, and determine the amount of time children spend with caregivers. Their beliefs and decisions indirectly structure the linguistic environment in which children grow up. This influence is evident across all clusters, highlighting parents' role as the primary gatekeepers of children's language experiences.

Finally, the studies collectively point to a systemic imbalance: English receives strong early support through parental aspirations and digital media, while Arabic relies more heavily on formal schooling and religious practices. This imbalance helps explain why children often show stronger early gains in English vocabulary and digital literacy, yet struggle with Arabic decoding, sound–symbol association, and structural analysis. The cross-cluster evidence suggests that balanced bilingual development requires intentional reinforcement of Arabic, particularly in early literacy skills.

Together, these cross-cutting insights highlight the need to view children's L1 and L2 development as a product of an interconnected ecosystem shaped by family practices, digital exposure, sociocultural caregiving, and developmental processes. Understanding these interactions provides a foundation for designing more effective interventions that support balanced and sustainable bilingual growth.

4.6 Implications for Parents

The findings across the reviewed studies highlight several implications for parents as key contributors to their children's early language environments. First, the evidence underscores the importance of providing balanced and high-quality input in both Arabic and English. While parents strongly support early English exposure, the studies show that Arabic development—particularly in decoding, sound–symbol association, and structural analysis—requires sustained, intentional reinforcement at home. Activities such as shared reading, exposure to Standard Arabic, and regular conversational interaction can help strengthen foundational L1 skills that may not develop automatically through schooling alone.

Second, the studies indicate that digital environments play a powerful role in shaping children's linguistic experiences. Younger children benefit from supervised use of interactive apps and educational content, while older children tend to shift toward entertainment-focused digital use. This suggests that parents can support more balanced development by guiding children toward age-appropriate educational content, setting reasonable time limits, and ensuring that digital exposure complements rather than replaces meaningful interaction in Arabic and English.

Third, the temporary influence of foreign housemaids on children's early Arabic development highlights the importance of parental presence and linguistic modelling, especially during the preschool years. Children recalibrate their language systems when exposed to richer input, but this process is facilitated when parents engage in regular, high-quality communication and provide opportunities for interaction with native-speaking peers and adults.

Finally, findings from online learning contexts emphasize the value of supportive but measured parental involvement. Parents play essential roles in organizing the learning environment, monitoring attention, and assisting with technical challenges, particularly for younger children. At the same time, excessive involvement may limit children's opportunities to develop autonomy,

self-regulation and responsibility. A balanced approach would be to provide support when needed while encouraging independence. This would result in healthy linguistic and academic development.

Taken together, these implications suggest that parents can play a vital role in fostering balanced development in L1 and L2 by offering rich linguistic input, modelling accurate language use, supervising digital engagement, and supporting children's growing independence at home and school.

4.7 *Limitations of The Meta-Analysis*

Although the findings of the eleven studies can be compared thematically, the studies differ substantially in their samples (mothers, both parents, teachers), children's age groups (early, middle, and late childhood), and data-collection instruments (surveys, interviews, standardized tests). These methodological variations prevent the consolidation of results into a single comparative table. Consequently, several limitations should be acknowledged when interpreting the findings of this meta-analysis. First, 10 of the studies depended on parental self-reports and opinions of the best age for learning English and children's proficiency level in English and Arabic as 9 studies surveyed and interviewed 9 groups of parents/mothers and one group of teachers, which may involve response bias. Only one study employed a researcher-constructed decoding test that had undergone standardization procedures and was piloted across ten schools to ensure appropriate skill coverage, difficulty level, reliability, and validity. These differences constrain the comparability of outcomes and restrict the extent to which effect sizes or error patterns can be meaningfully aligned across studies.

Second, the studies vary in the age groups and educational settings examined. While all samples involve children under the age of twelve, they include preschoolers, early elementary, middle and late elementary children. These developmental differences naturally influence proficiency level in L1 and L2 and were intentionally retained to examine variation in factors such as the impact of iPad use on language learning and home activities used by the parents. Similarly, the studies represent a range of school types - public, private, international, and Quranic - each offering distinct English language learning environments although not all school types are represented across all studies, limiting the ability to conduct systematic comparisons of instructional contexts.

Third, the meta-analysis is constrained by the nature of the available data. Nine studies reported findings primarily in the form of percentages and descriptive statistics, which is standard for survey-based research. In contrast, the decoding-test study employed a full set of quantitative statistical procedures. Error frequencies and percentages were calculated for each section of the test, and descriptive statistics (mean, median, standard deviation, standard error, range, and percentiles) were generated using SPSS. Correlation coefficients were computed among test sections and with the total score. A one-way ANOVA and Scheffé post-hoc tests were used to compare grades and identify the most difficult skills. Sub-skill difficulty was further examined by aggregating item-level error percentages and calculating median values for each sub-skill. These methodological differences limit the extent to which numerical results can be synthesized or statistically compared across studies.

Furthermore, most samples consisted of parents, none examined teachers' perspectives on children's language acquisition. Assessment of children's L1 and L2 proficiency was also limited: only Arabic word-identification skills were directly measured. No study assessed English decoding ability or oral proficiency in either Arabic or English, which narrows the scope of conclusions regarding children's overall bilingual development.

Fourth, the review is situated within a specific cultural and linguistic context. Sociocultural factors such as the presence of foreign housemaids, the prevalence of English-dominant digital media, and the diglossic nature of Arabic in Saudi Arabia may not generalize to other bilingual settings even in other Arab countries. These contextual features shape language exposure in ways that may differ from bilingual environments in Western, Asian, or African contexts.

Finally, the meta-analysis reflects only the eleven studies that were available and met the inclusion criteria. The reliance on a relatively small number of studies (n = 11) limits the breadth and generalizability of the conclusions. Moreover, the eleven studies do not cover all aspects of first and second language acquisition. These studies were originally conducted because the author felt the overweeningly focus - among parents in Saudi Arabia - on teaching English at the expense of Arabic regardless of the excuses they give for their position. Current parents' practices endanger and marginalize the Arabic language. English can be learnt and mastered any time, but it is not the case with Arabic. If children do not master it at an early age, they will never do.

Despite these limitations, the meta-analysis offers a coherent and integrative synthesis of the available evidence and provides valuable insights into the multifaceted factors shaping Saudi children's L1 and L2 development.

4.8 *Future Research Directions*

The findings of this meta-analysis point to several avenues for future research that can deepen understanding of Saudi children's L1 and L2 development and address gaps identified across the included studies. First, there is a need for more standardized and validated assessment tools to measure children's linguistic skills in both English and Arabic. Many existing studies rely on researcher-constructed, teacher-made tests or descriptive measures, limiting comparability across studies. Developing shared instruments for assessing phonological awareness, decoding, vocabulary, grammar, and reading and listening comprehension in both languages would enable more robust cross-study synthesis.

Second, future research should track the long-term effects of early emphasis on English on students' achievement across school subjects and on their use of Arabic in written and spoken communication. Most available studies provide cross-sectional snapshots, making it difficult to trace how early exposure to English, digital media, or non-native caregiver input shapes language outcomes over time. Longitudinal designs would clarify which early influences have lasting effects and which are temporary or developmentally constrained.

Third, more work is needed to explore the interaction between digital environments and literacy development, especially in Arabic. While younger children benefit from interactive apps, older children tend to disengage from educational digital content. Future studies could investigate how digital tools can be designed or adapted to support sustained engagement with Arabic reading, vocabulary, and morphology.

Fourth, future studies should examine instructional practices across different school types—public, private, international, and Quranic—to understand how curricular approaches, teacher training, and language policies contribute to children's L1 and L2 development. Comparative studies across school systems would help identify effective strategies for supporting balanced Arabic and English learning.

Finally, there is a need for research that integrates quantitative and qualitative approaches to capture the complexity of children's linguistic environments. Mixed-methods designs can illuminate not only what children know, but also how they experience language learning across home, school, and digital contexts.

Together, these directions highlight the importance of developing a more comprehensive, methodologically rigorous, and contextually grounded research base to support evidence-informed practices that foster healthy and balanced bilingual development among Saudi children.

4.9 *Positioning This Work Within Global L1 and L2 Acquisition by Children*

The findings of this meta-analysis align with and extend global research on children's first and second language acquisition. Internationally, studies consistently show that children's bilingual development is shaped by the interaction of home input, schooling, digital exposure, and sociocultural context. The Saudi-based evidence presented in this review reinforces these global patterns while highlighting unique contextual features that contribute to the broader understanding of L1 and L2 acquisition in early childhood.

Globally, parents play a decisive role in shaping early language acquisition, particularly through beliefs about the value of bilingualism and the timing of L2 introduction. The strong parental preference for early English exposure observed in Saudi Arabia mirrors trends in many multilingual societies where English is associated with academic mobility and global participation. At the same time, the Saudi context illustrates how early L2 prioritization can coexist with a strong cultural commitment to maintaining L1, contributing to international discussions on balanced L1 and L2 development and the conditions under which both languages can thrive.

The influence of digital environments on language learning is also widely documented in global research. The Saudi findings echo international evidence showing that younger children benefit from interactive digital tools, while older children gravitate toward entertainment-oriented use. This pattern contributes to global debates on the developmental sensitivity of digital learning, emphasizing the need for age-appropriate design and parental mediation to support sustained engagement with both L1 and L2.

Sociocultural caregiving arrangements, such as the presence of non-native housemaids, represent another area where the Saudi context offers valuable insights. While global studies have examined the effects of multilingual households and immigrant caregivers, the Saudi case provides a distinctive example of how temporary non-native input shapes early phonological and grammatical development, and how children re-adjust once exposed to richer native input. This contributes to broader theoretical discussions on input quality, plasticity, and the resilience of L1 acquisition.

Finally, the patterns of early literacy difficulties observed in Saudi children—particularly challenges with sound–symbol association, written-sound mapping, and structural analysis—parallel findings from global research in alphabetic languages. These similarities reinforce the universality of certain developmental bottlenecks in early reading acquisition, while also highlighting the need for Arabic-specific instructional approaches that account for the language's morphological and orthographic complexity.

Overall, positioning this work within global L1 and L2 acquisition research demonstrates that Saudi children's bilingual development reflects both universal developmental processes and context-specific sociocultural dynamics. By integrating parental beliefs, digital exposure, caregiver influences, and linguistic performance, this meta-analysis contributes a nuanced and culturally grounded perspective to the international literature on early bilingualism.

4.10 Sociolinguistic Implications of Parental Language Choices

Findings from this review highlight a growing concern regarding current parental practices - particularly the prioritization of early English exposure at the expense of Arabic (L1) - and the potential risk this poses to children's mastery of their first language. While English can be acquired and mastered at virtually any stage of life, Arabic - given its diglossic nature, unique phonological system, complex morphology, and early developmental window - requires sustained and intentional support during early childhood. Children who do not establish a solid foundation in Arabic during these formative years are unlikely to achieve full proficiency later, with long-term consequences for literacy, identity formation, and academic success.

Examples observed among relatives and community members reflect a broader sociolinguistic pattern: children who can write sophisticated, creative texts in English—such as fanfiction inspired by "Harry Potter"—struggle to produce even a basic paragraph in Arabic. Likewise, university students educated in English-medium schools often report difficulty articulating medical or scientific concepts in Arabic, not due to cognitive limitations, but because of insufficient early exposure to formal Arabic. These cases underscore the urgency of strengthening Arabic literacy before prioritizing English.

As a professor of English language and translation, my concern for the future of Arabic does not stem from linguistic insecurity or limited engagement with global languages. Rather, it arises precisely from a deep understanding of language acquisition processes, the sociopolitical dominance of English, and the pedagogical realities of bilingual education. My advocacy is therefore not personal, but principled—rooted in decades of research, observation, and lived experience—and reflects a commitment to preserving the linguistic and cultural integrity of communities that identify as Arab.

Neglecting Arabic during the critical period of language development risks producing a generation of children who are functionally proficient in English yet lack proficiency in their mother tongue. These patterns mirror global trends in which English, as a dominant international language, reshapes local linguistic ecologies. This reality underscores the need for intentional policies and family practices that safeguard the vitality of Arabic as both an academic and cultural resource.

4.11 Comparison with Prior Systematic Reviews and Meta-Analyses

Findings of the present review are consistent with findings of prior SR and MA studies in the literature as reviews on caregiver input and home learning environments—such as those by Coffey & Snedeker, Dong & Chow, Nag et al., and Zhang et al. The current SR confirms that parental beliefs, home literacy practices, and the quality of linguistic input play central roles in shaping children's L1 and L2 development. Similar to these studies, the present review highlights the strong influence of parental attitudes, the structure of home routines, and the availability of literacy materials on children's language outcomes.

Current findings are also consistent with SRs on digital learning and mobile applications, like those by Booton et al., Dehganzadeh & Dehganzadeh, Şimşek & Şimşek, and Zhang et al. (2020). These reviews emphasize that digital tools can support early vocabulary and literacy development when used interactively and with adult mediation. The current SR adds a culturally specific observation: older children tend to shift toward entertainment-dominant digital use, which limits the educational potential of technology, an issue less emphasized in prior reviews.

Additionally, the current findings are similar to prior review studies on the role of caregiver speech and attachment relationships, such as the meta-analyses by Dagan et al. and Washington-Nortey et al. These studies show that the quality of interaction with caregivers and peers predicts language competence. The Saudi context adds a new dimension by documenting the temporary linguistic influence of foreign housemaids, showing how non-native input shapes early phonology and grammar before being corrected by richer native input in school settings and broader home environment.

Results of early word identification difficulty identified in the current SR—particularly difficulties with sound–symbol association, written-sound correspondences, and structural analysis—are consistent with prior SR study findings reported by Hur et al., Lewis et al., and Lester et al. These studies show similar difficulties in decoding and morphological processing as universal obstacles in early reading development. The current review extends this work by showing how these challenges manifest specifically in Arabic, a morphologically rich and orthographically complex language.

Finally, the strong parental preference for early English exposure observed in the current review aligns with broader trends reported by prior reviews by Oliver & Azkarai, Tahir, and Nguyen et al., which describe the global interest in early bilingualism driven by parental aspirations, digital media and schooling demands. The Saudi case contributes a culturally grounded example of how these global forces interact with local linguistic traditions, religious literacy practices, and school types to produce distinctive bilingual development.

Overall, the present review confirms many of the mechanisms identified in prior research studies such as digital engagement, home literacy, instructional environments and caregiver input, while offering a nuanced, context-specific account of how these mechanisms operate within the Saudi Arabic–English bilingual landscape.

5. Recommendations

Based on the findings of this SR and MA, and supported by established principles of early language acquisition, this study proposes the following recommendations for parents, teachers, early childhood educators and curriculum designers:

1) **Strengthening Early Arabic Literacy Foundations** requires addressing persistent difficulties in sound–symbol association, written–sound mapping, and structural analysis through explicit instruction in phonological awareness and decoding, with systematic practice in segmenting, blending, and manipulating sounds. Instruction should also provide structured exposure to Arabic orthography, including hamza, shadda, long and short vowels, and common morphological patterns, alongside increased exposure to Standard Arabic through shared reading, storytelling, and age-appropriate texts that build vocabulary and syntactic awareness. In addition, early screening and targeted support are essential for children who exhibit ongoing challenges in decoding or structural analysis to prevent these early weaknesses from developing into long-term literacy difficulties.

2) **Strengthening early English language instruction** requires adopting naturalistic, mother-tongue–like approaches that emphasize meaningful interaction, repetition, and exposure in real-life contexts. Effective instruction involves consistently using the target language in class without relying on L1 translation, allowing students to internalize vocabulary, structures, and pronunciation more naturally through immersion supported by gestures, real objects, role-play, and contextualized interaction. Sensory-based learning experiences—where children learn through touch, movement, and concrete activities—further enhance comprehension and reduce dependence on abstract grammar explanations. Repeated exposure to rich language input helps children internalize linguistic patterns effortlessly, especially when teachers maintain high expectations for learners' innate ability to imitate sounds and self-correct. Integrating real-world learning experiences in authentic environments such as markets, playgrounds, and community spaces makes language learning meaningful and memorable. Early reading should be supported through phonics-based instruction that teaches letter sounds rather than letter names, using flashcards and word-building activities to strengthen decoding skills. Creative tasks such as writing simple poems, short stories, or thematic sentences—even for beginners—promote confidence, deepen vocabulary retention, and foster ownership of the language. Incorporating songs, chants, and rhythmic activities supports pronunciation, intonation, and vocabulary development, while cultivating a positive emotional climate through teacher enthusiasm and warmth enhances motivation and engagement. Finally, instruction should help children learn how to learn by fostering autonomy, curiosity, and self-regulation, ensuring that language learning becomes both effective and developmentally appropriate.

3) **Given the growing role of digital media in children's learning**, there is a pressing need to expand and improve high-quality, culturally grounded Arabic digital and print resources. This includes developing Arabic digital reading apps, interactive storybooks, and literacy games that reflect cultural content while supporting linguistic development, as well as integrating age-appropriate digital tools—such as apps, cartoons, and online content—to reinforce vocabulary, expressions, and reading fluency. Children's digital engagement should be guided intentionally by prioritizing interactive educational apps for younger learners, setting time limits, co-using digital content with them, and encouraging older children to use Arabic reading apps, audiobooks, and educational platforms. Importantly, digital use should complement—not replace—rich linguistic interaction, shared reading, and face-to-face communication. Authentic, child-friendly materials such as children's books, short films, labeling activities, school radio programs, and collaborative reading circles can further create meaningful contexts for language use and enhance motivation. Together, these resources help bridge the gap between home, school, and digital environments while supporting both L1 and L2 development.

4) **Enhancing teacher training and school practices** is essential, as teachers play a central role in shaping children's linguistic outcomes. Effective preparation requires comprehensive training in language acquisition and pedagogy, since native-like proficiency alone is insufficient; teachers must be grounded in learning theories, instructional strategies, assessment, and technology-enhanced teaching. Professional development should include evidence-based early literacy instruction for Arabic—covering phonological awareness, decoding, orthographic knowledge, and morphological instruction—as well as training in developmentally appropriate English instruction that integrates English without displacing Arabic and supports balanced bilingual development. Teachers also need differentiated instructional strategies to assist children with persistent literacy challenges in either language. Ongoing professional development should promote innovation and reflective practice, encouraging educators to move beyond traditional methods and adopt evidence-based, child-centered approaches.

5) **Schools can support parents in online and hybrid learning** contexts by providing clear guidelines on when parental involvement is beneficial, offering training on platform use, assignment submission, and troubleshooting, and encouraging a balanced approach that supports children's autonomy while maintaining appropriate parental guidance.

6) **Promoting a balanced bilingual environment at home is essential**, with parents playing a central role in maintaining a strong L1 (Arabic) foundation through daily conversational interaction, incorporating Arabic storybooks, Quranic reading, and print materials into routines, and supporting English learning through structured, supervised activities rather than replacing Arabic input. Ensuring that enthusiasm for English does not unintentionally weaken Arabic literacy is critical for healthy bilingual development.

7) **Given the temporary influence of foreign housemaids** on early Arabic development, parents should increase direct interaction with young children—especially in the preschool years—while expanding opportunities for interaction with native-speaking peers and adults. Awareness campaigns can further help families understand how the quality of linguistic input shapes early phonology and grammar.

Taken together, these recommendations highlight the need for coordinated efforts across homes, schools, and educational systems to support children's balanced development of l1 and L2. By strengthening early Arabic literacy foundations, adopting developmentally appropriate approaches to English instruction, and leveraging digital and sociocultural resources, educators and families can create learning environments that nurture both languages. This MA highlights not only the progress made in understanding Saudi children's linguistic development, but also the work that remains. Continued collaboration among researchers, teachers, parents, and policymakers are essential for building a robust, evidence-informed foundation that supports children's linguistic, cognitive, and academic growth.

Conflicts of Interest: The author declares no conflict of interest.

ORCID ID: https://orcid.org/0000-0002-6255-1305

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

[1]   Al-Jarf, R. (2026). Systematic Review and Meta-Analysis of 2024–2025 Studies on AI Arabic Translation, Linguistics and Pedagogy. (2026). *Frontiers in Computer Science and Artificial Intelligence*, *5*(1), 07-27. https://doi.org/10.32996/jcsts.2026.5.1.2

[2]   Al-Jarf, R. (2025). Why some Arab parents speak to their children at home in English (L2). *Journal of Learning and Development Studies*, *5*(1), 22-31. DOI: 10.32996/jlds.2025.5.1.3. Google Scholar

[3]   Al-Jarf, R. (2023a). Digital reading among children in Saudi Arabia. *Journal of Computer Science and Technology Studies,* *5*(3), 35-45. https://doi.org/10.32996/jcsts.2023.5.3.4. Google Scholar. ERIC ED630952.

[4]   Al-Jarf, R. (2023b). Digital reading among educated Arabs: A Twitter-based study. *Journal of Computer Science and Technology Studies, 5(*3), 1-12. DOI: 10.32996/jlds.2023.3.2.3. ERIC ED629247. Google Scholar

[5]   Al-Jarf, R. (2023c). Learning English by kindergarten children in Saudi Arabia: A mothers' perspective. *Journal of Learning and Development Studies (JLDS), 3*(2), 15-32. DOI: 10.32996/jlds.2023.3.2.3. ERIC ED629184. Google Scholar

[6]   Al-Jarf, R. (2023d). Reading habits and motivation among educated Arabs in the age of social media and distractions. *Journal of Psychology and Behavior Studies, 3*(1), 32-44. DOI: 10.32996/jpbs.2023.3.1.4. ERIC ED629227. Google Scholar

[7]   Al-Jarf, R. (2023e). Favorite magazines and reading topics among Saudi female college students. *International Journal of Middle Eastern Research, 2*(1), 1-13. DOI: 10.32996/ijmer.2023.2.1.1. ERIC ED633837. Google Scholar

[8]   Al-Jarf, R. (2023f). Preparing High Schools Students for the University and Life after Graduation. *Eurasian Arabic Studies, 6* (3), 93-116. DOI: 10.26907/2619-1261.2023.6.3.93-116. Google Scholar

[9]   Al-Jarf, R. (2022a). Developing Students' Global Awareness in EFL Reading and Speaking. *South Asian Research Journal of Arts, Language and Literature (SARJALL), 4*(1), 31-38. DOI: 10.36346/sarjall.2022.v04i01.005. ERIC ED618471. Google Scholar

[10]   Al-Jarf, R. (2022b). Educated Arabs' Reading Interests and Preferences Before, During and After the Pandemic. *Journal of Learning and Development Studies (JLDS), 2*(3), 23-37. ERIC ED624099. https://doi.org/10.32996/jlds.2022.2.3.4. Google Scholar

[11]   Al-Jarf, R. (2022c). English language education at the elementary school level in Saudi Arabia: A parents' perspective. *British Journal of Teacher Education and Pedagogy (BJTEP), 19*(30, 31-44. DOI: 10.32996/bjtep.2022.1.3.4. ERIC ED622945. Google Scholar

[12]   Al-Jarf, R. (2022d). Enhancing EFL Students' Reading and Appreciation Skills with Mobile Fiction Apps. *International Journal of Linguistics Studies. (IJLS), 2*(2), 15-23. DOI: 10.32996/ijls.2022.2.2.3. Google Scholar

[13]   Al-Jarf, R. (2022e). How parents promote English and Arabic language proficiency in elementary school children in Saudi Arabia. *Journal of Psychology and Behavior Studies (JPBS), 2*(2), 21-29. DOI: 10.32996/jpbs.2022.2.2.4. ERIC ED622131. Google Scholar

[14]   Al-Jarf, R. (2022f). Mobile Fiction Apps for Enhancing EFL College Students' Reading and Appreciation Skills. *International Journal of Linguistics Studies (IJLS), 2*(2), 15-23. DOI: 10.32996/ijls.2022.2.2.3. ERIC ED618966. Google Scholar

[15]   Al-Jarf, R. (2022g). Par*ental attendance of children's online classes from the perspective of parents and teachers in Saudi Arabia.* The 18th International Scientific Conference eLearning and Software for Education (eLSE), Bucharest, Romania. May 12-13, 2022, 10.12753/2066-026X-22-000. ERIC ED623334. Google Scholar

[16]   Al-Jarf, R. (2022h). Reading Interests of University Female Students in Saudi Arabia. *Eurasian Arabic Studies, 5*(4), 50-75. DOI: 10.26907/2619-1261.2022.5.4.50-75. Google Scholar

[17]   Al-Jarf, R. (2022i). The influence of housemaids on Saudi young children's Arabic language acquisition from the perspective of mothers. *International Journal of Education and Social Science Research (IJESSR), 5*(1), 282-294. Doi: 10.37500/IJESSR.2022.5123. **ERIC** ED618410. Google Scholar

[18]   Al-Jarf, R. (2021a). Collaborative Mobile eBook Reading for Struggling EFL College Readers. *IOSR Journal of Research and Methods in Education (IOSR-JRME), 11*(6), 32-42. DOI: 10.9790/7388-1106023242. ERIC ED618023. Google Scholar

[19]   Al-Jarf, R. (2021b). *Differential effects of the ipad on first and second language acquisition by Saudi children during the Covid-19 pandemic.* The 17th International Scientific Conference eLearning and Software for Education, Bucharest, Romania. Vol 1, April 22-23, 2021. Doi 10.12753/2066-026X-21-000. Google Scholar

[20]   Al-Jarf, R. (2021c). Enhancing EFL freshman students' reading skills with inspirational quotes. *Asian Research Journal of Arts & Social Sciences (ARJASS), 13*(4), 1-11. https://doi.org/10.9734/arjass/2021/v13i430219. ERIC ED620448. Google Scholar

[21]   Al-Jarf, R. (2021d). How much material do EFL college instructors cover in reading courses? *Journal of Applied Linguistics and Language Research (JALLR), 8*(1), 65-79. ERIC ED620414. Google Scholar

[22]   Al-Jarf, R. (2021e). Impact of the iPad on Saudi young children in the home environment as perceived by their mothers. *International Journal of Research in Engineering, IT and Social Sciences (IJREISS), 11*(2), 26-35, (FEB), ISSN: 2250-0588. ERIC ED613057. Google Scholar

[23]   Al-Jarf, R. (2021f). Teaching reading to EFL freshman students with mind-mapping software. *Journal for Research Scholars and Professionals of English Language Teaching (JRSP-ELT), 24*(5), 1-12. https://doi.org/10.2139/ssrn.3825817. ERIC ED618184. Google Scholar

[24]   Al-Jarf, R. (2021g). Testing reading for specific purposes in an art education course for graduate students in Saudi Arabia. *International Journal of Advance and Innovative Research, 8*(1), 32-42. ERIC ED617119. Google Scholar

[25]   Al-Jarf, R. (2020). Should we teach English to children under the age of six? *Eurasian Arabic Studies, 9,* 65-97. https://cyberleninka.ru/article/n/should-we-teach-english-to-children-under-the-age-of-six . Google Scholar

[26]   Al-Jarf, R. (2019a). Quality in teaching reading to high school students. *Eurasian Arabic Studies, 5,* 36-62. Google Scholar

[27]   Al-Jarf, R. (2019b). Teaching reading to EFL Arabic students online. *Eurasian Arabic Studies, 8,* 57-75. ERIC ED613084. Google Scholar

[28]   Al-Jarf, R. (2018). First, second and third grade students' word identification difficulties. *Eurasian Arabic Studies*, 8, 22-93. Google Scholar

[29] Al-Jarf, R. (2015). *Enhancing reading and speaking skills in EFL through multicultural children's short stories*. 7th International Conference, Building Cultural Bridges (ICBCB) titled: Integrating Languages, Linguistics, Literature, Translation, and Journalism into Education. Suleyman Demirel University, Almaty, Kazakhstan. April 23-24, 2015. https://doi.org/10.2139/ssrn.3848464. ERIC ED610158. Google Scholar

[30] Al-Jarf, R. (2014). *Integrating Elluminate in EFL reading instruction*. The 10th International Conference on eLearning and Software for Education (eLSE). 3, 19-26. Bucharest, Romania. DOI: 10.12753/2066-026X-14-142. ERIC ED623733. Google Scholar

[31] Al-Jarf, R. (2013). *Enhancing freshman students' performance with online reading and writing activities.* 9th eLearning and Software for Education Conference (eLSE). Bucharest, Romania. 2, 524-530. DOI: 10.12753/2066-026X-13-193. ERIC ED623858. Google Scholar

[32] Al-Jarf, R. (2011). *Developing and testing reading skills through art texts*, in In S.V. Lobanov, S. V. Bulaeva, S.V. Somova, N.P. Chepel (Editors), "Language and Communication through Culture". Pp. 167-175. Ryazan State University. Russia. ERIC ED639215. Google Scholar

[33] Al-Jarf, R. (2010a). *Enhancing EFL students' reading skills with online videos*. 9th AsiaCALL Conference 2010. H. M. Patel Institute of English Training and Research, Vallabh Anand, Gujarat, India. Nov 29-Dec 1, 2010. https://www.researchgate.net/publication/390701583. Google Scholar

[34] Al-Jarf, R. (2010b). *Integrating RCampus in college reading and writing for translation students*. Touchpoint 2010 International Conference on Technology in Education. Manila, Philippines, March 5-6. ERIC ED609048. Google Scholar

[35] Al-Jarf, R. (2009a). *Maximizing ESL freshman readers' skill with online instruction*. In Roger Cohen (Ed.) Explorations in Second Language Reading. Pp. 133-144 TESOL. ERIC ED523349. Google Scholar

[36] Al-Jarf, R. (2009b). *Promoting EFL secondary students' extensive reading skill*s. In Andrzej Cirocki (Ed.). Extensive Reading in English Language Teaching. 603-611. Lincom Europa: Munic, Germany. ERIC ED638516. Google Scholar

[37] Al-Jarf, R. (2009c). *Teaching extensive reading to EFL secondary students online*. In Andrzej Cirocki (Ed.). Extensive Reading in English Language Teaching. 595-602. Lincom Europa: Munic, Germany. Verlag: Lincom Europa. ERIC ED638467. Google Scholar

[38] Al-Jarf, R. (2008). The impact of English as an international language (EIL) upon Arabic in Saudi Arabia. *Asian EFL Journal*, *10*(4). Google Scholar

[39] Al-Jarf, R. (2007a). A proposed model of quality criteria for preparing secondary school students for university studies and life. SEPA. http://search.shamaa.org/FullRecord?ID=52775

[40] Al-Jarf, R. (2007b). *Developing reading and literacy skills in Saudi Arabia*. https://doi.org/10.2139/ssrn.3849626. ERIC ED497944. Google Scholar

[41] Al-Jarf, R. (2007c). *Impact of blended learning on EFL college readers*. IADIS International Conference on e-Learning, Lisbon. ERIC ED634492. Google Scholar

[42] Al-Jarf, R. (2005a). Examples of successful literacy campaigns in the world. *Moroccan Studies, 20,* 189-198. King Abdul-Aziz Center for Arabic and Islamic Studies. Casablanca, Morocco. ERIC ED639269. Google Scholar

[43] Al-Jarf, R. (2005b). Reading promotion programs in South Korea. *Moroccan Studies, 20,*183-188. King Abdul-Aziz Center for Arabic and Islamic Studies. Casablanca, Morocco. ERIC ED639132. Google Scholar

[44] Al-Jarf, R. (2004a). *Arabic websites for pre-school children: Current status and future perspectives*. Saudi Educational and Psychological Association. King Saud University, Riyadh, Saudi Arabia. ERIC ED638521. Google Scholar

[45] Al-Jarf, R, (2004b). *Attitudes of youth towards using of both Arabic and English languages in education*. KSA: King Saud university. Google Scholar

[46] Al-Jarf, R. (2004c). *College Students' Attitudes towards Using English and Arabic as a Medium of Instruction at the university Level*. Globalization and Priorities of Education. Pp 1-15. Google Scholar

[47] Al-Jarf, R. (2004d). *What college students read in the globalization era*. Globalization and Educational Priorities Conference. King Saud University, College of Education. Google Scholar

[48] Al-Jarf, R. (2004e). *What college students read in the global age*. Globalization and Educational Priorities Conference. King Saud University, College of Education. Google Scholar

[49] Al-Jurf, R. (2004f). *What our youth read in the age of globalization*. Symposium of Globalization and Priorities of Education, King Saud University, Saudi Arabia. Google Scholar

[50] Al-Jarf, R. (2003). Reading lesson design in junior and senior high school reading textbooks in Saudi Arabia. *Risaalat Ul-Khaleej Al-Arabi. Arab Bureau of Education for the Gulf States, 86*, 1-38. Google Scholar

[51] Al-Jarf, R. (2001a). Advance organizers in elementary, junior and senior high school reading textbooks in Saudi Arabia. *Journal of Educational Studies, July*. Institute of Educational Studies, University of Cairo. Google Scholar

[52] Al-Jarf, R. (2001b). Cohesion Skill Instruction in Junior and Senior Reading Textbooks in Saudi Arabia: An Evaluation Study. *Risaalat Ul-Khaleej Al-Arabi. Arab Bureau of Education for the Gulf States, 87*, 73-97. Doi: 10.35270/0011-021-078-003. Google Scholar

[53] Al-Jarf, R. (2001c). Context analysis skills instruction in elementary, junior and senior high school reading textbooks in Saudi Arabia. *Journal of Curriculum and Instruction Studies, 71*, 73-97. Google Scholar

[54] Al-Jarf, R. (2001d). Study skills instruction in junior and senior reading textbooks in Saudi Arabia. *Scientific Journal. College of Education. Asiut University, 17*(2), July. Google Scholar

[55] Al-Jarf, R. (2002). *Text structure instruction in junior and senior high school reading textbooks*. 8th Yearbook of the Saudi Educational and Psychological Association. Google Scholar

[56] Al-Jarf, R. (1995). *An Arabic word identification diagnostic test for the first three grades*. Center for Educational Research. College of Education. King Saud University. Google Scholar

[57] Al-Jarf, R. (1994). Analysis of Saudi first, second and third grade students' errors in word identification. *Journal of Contemporary Education; Cairo; 9(61)*, 88-147. Google Scholar

[58] Al-Jarf, R. (1992). Classific*ation of word identification exercises in elementary school reading textbooks in Saudi Arabia*. Third Yearbook of the Saudi Educational and Psychological Association. Pp. 73-108.. Google Scholar

[59] Al-Jarf, R. (1989a). *A model for a reading lab for Saudi students.* College of Languages and Translation, King Saud University, Riyadh, Saudi Arabia. September. ERIC ED650977. Google Scholar

[60] Al-Jarf, R. (1989b). *Classification of reading comprehension questions in elementary basal readers in Saudi Arabia*. Center for Educational Research, King Saud University. https://www.researchgate.net/profile/Reima-Al-Jarf/publication/352665671 Google Scholar

[61] Banaruee, H., Khatin-Zadeh, O., & Farsani, D. (2023). The challenge of psychological processes in language acquisition: A systematic review. *Cogent Arts & Humanities*, *10*(1), 2157961.

[62] Booton, S., Hodgkiss, A. & Murphy, V. (2023). The impact of mobile application features on children's language and literacy learning: a systematic review. *Computer Assisted Language Learning*, *36*(3), 400-429.

[63] Carvalho, A., Lemos, S. & Goulart, L. (2016). Language development and its relation to social behavior and family and school environments: a systematic review. In *Codas* (Vol. 28, pp. 470-479). Sociedade Brasileira de Fonoaudiologia.

[64] Coffey, J. & Snedeker, J. (2025). How strong is the relationship between caregiver speech and language development? A meta-analysis. *Journal of Child Language*, 1-36.

[65] Dagan, O. et al. (2024). Configurations of mother–child and father–child attachment relationships as predictors of child language competence: An individual participant data meta-analysis. *Child development*, *95*(1), 50-69.

[66] Dehganzadeh, H., & Dehganzadeh, H. (2020). Investigating effects of digital gamification-based language learning: A systematic review. *Journal of English Language Teaching and Learning*, *12*(25), 53-93.

[67] Dong, Y., & Chow, B. (2022). Home literacy environment and English as a second language acquisition: A meta-analysis. *Language Learning and Development*, *18*(4), 485-499.

[68] Durán, L., et al. (2016). Bilingual and home language interventions with young dual language learners: A research synthesis. *Language, Speech, and Hearing Services in Schools*, *47*(4), 347-371.

[69] Elahi Shirvan, M. et al. (2024). A multilevel meta-analysis of language mindsets and language learning outcomes in second language acquisition research. *Educational Psychology Review*, *36*(1), 15.

[70] Henwood, T. et al. (2020). Do home visiting programmes improve children's language development? A systematic review. *International journal of nursing studies*, *109*, 103610.

[71] Hur, J., Snyder, P., & Reichow, B. (2020). Systematic review of English early literacy interventions for children who are dual language learners. *Topics in Early Childhood Special Education*, *40*(1), 6-23.

[72] Jiang, Y., Kaplan, B., & Ko-Wong, L. (2025). Does teacher talk matter too? A meta-analysis of partial correlations between teachers' language practices and children's language development from preschool to third grade. *Review of Educational Research*, 00346543251339131.

[73] Lester, N., Twomey, K. & Theakston, A. (2025). What difficulties do children learning English in addition to another language experience with English oral language? A systematic review. *The Language Learning Journal*, *53*(2), 264-285.

[74] Lewis, M. et al. (2016). A quantitative synthesis of early language acquisition using meta-analysis.

[75] Loeffler, M. et al. (2025). Early expressive and receptive language development in preterm vs full-term children: a meta-analysis. *Pediatrics*, *156*(2), e2024070477.

[76] Macaro, E., Handley, Z., & Walter, C. (2012). A systematic review of CALL in English as a second language: Focus on primary and secondary education. *Language Teaching*, *45*(1), 1-43.

[77] Marjanovič-Umek, L., & Fekonja-Peklaj, U. (2017). Gender differences in children's language: A meta-analysis of Slovenian studies. *Center for Educational Policy Studies Journal*, *7*(2), 97-111.

[78] Mavi, D., & Erbay, F. (2021). The effect of mobile and information technologies on the language development design of preschool children: a meta-analysis and meta-synthesis study. *Journal of Universal Computer Science (JUCS)*, *27*(5).

[79]   Mohamed, A. & Shaaban, T. (2021). The effects of educational games on EFL vocabulary learning of early childhood students with learning disabilities: A systematic review and meta-analysis. *International Journal of Linguistics, Literature and Translation*, *4*(3), 159-167.

[80]   Nag, S. et al. (2024). Home learning environments and children's language and literacy skills: A meta-analytic review of studies conducted in low-and middle-income countries. *Psychological Bulletin*, *150*(2), 132.

[81]   Nguyen, D. et al. (2024). Second language learning through play in early childhood education: A systematic review.

[82]   Oliver, R., & Azkarai, A. (2017). Review of child second language acquisition (SLA): Examining theories and research. *Annual Review of Applied Linguistics*, *37*, 62-76.

[83]   Pradheepa, A., Gurusamy, K., & Pushpanathan, T. (2025). The role of language games in enhancing vocabulary acquisition: A meta-analysis. *Australian Journal of Applied Linguistics*, *8*(1), 2073-2073.

[84]   Qureshi, M. (2016). A meta-analysis: Age and second language grammar acquisition. *System*, *60*, 147-160.

[85]   Richardson, T. et al. (2024). How does nature support early language learning? A systematic literature review. *Early Years*, *44*(3-4), 682-709.

[86]   Salehuddin, K., & Mahmud, F. (2024). Assessing Children's Language Development: A Systematic Literature Review on Early Language Milestone Scales. *GEMA Online Journal of Language Studies*, *24*(4).

[87]   Silburn, S. et al. (2011). Early years English language acquisition and instructional approaches for Aboriginal students with home languages other than English: A systematic review of the Australian and international literature. *Darwin: Menzies School of Health Research*.

[88]   Şimşek, E. & Şimşek, B. (2025). Technology-assisted vocabulary learning for preschool children: a meta-analysis. *Computer Assisted Language Learning*, 1-33.

[89]   Spence, J., Hornsey, M. & Imuta, K. (2021). Something about the way you speak: A meta-analysis on children's linguistic-based social preferences. *Child Development*, *92*(2), 517-535.

[90]   Tahir, A. (2023). Factors affecting second language comprehension ability in children: a systematic review. *International Journal of Research on English Teaching and Applied Linguistics*, *4*(2), 1-12.

[91]   Taylor, G. et al. (2024). Does adult-child co-use during digital media use improve children's learning aged 0–6 years? A systematic review with meta-analysis. *Educational Research Review*, *44*, 100614.

[92]   Washington-Nortey, P. et al. (2022). The impact of peer interactions on language development among preschool English language learners: A systematic review. *Early Childhood Education Journal*, *50*(1), 49-59.

[93]   Weng, Y. et al. (2024). The effectiveness of immersive learning technologies in K–12 English as second language learning: A systematic review. *ReCALL*, *36*(2), 210-229.

[94]   Wulansari, & Nida, C. (2020). A systematic literature review: First language acquisition for children in linguistics perspective. *4th International Conference on Learning Innovation and Quality Education* (pp. 1-6).

[95]   Zhang, R. et al. (2020). A systematic review of research on e-book-based language learning. *Knowledge Management & E-Learning*, *12*(1), 106-128.

[96]   Zhang, X., Lau, C., & Su, Y. (2023). Home environment and development of English as a second/foreign language for young children in Asian contexts: A systematic review and meta-analysis. *Early Education and Development*, *34*(1), 274-305.