Bibliometric Study of Research Trends
in Arabic Language Bilingualism (1986-2024)

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Abstract

This study aims to map the research landscape of Arabic language bilingualism through a comprehensive bibliometric analysis covering the period from 1986 to 2024. The increasing global prevalence of bilingualism, particularly among Arabic speakers in countries where Arabic is not the primary language, underscores the need for a systematic understanding of how research in this field has evolved. This study collected data from the Scopus database and applied bibliometric methods, including citation analysis, co-authorship network mapping, and journal quartile evaluation, using Microsoft Excel, Publish or Perish (PoP), and VOSviewer. The analysis revealed that the United States was the most influential contributor to research on Arabic bilingualism. The year 2018 recorded the highest number of publications, with a total of 16, while 2017 had the highest number of citations, reaching 348, indicating strong research impact. Current research themes emphasize the cognitive benefits of bilingualism, such as improved working memory and problem-solving abilities, and explore their implications in educational and social settings. These findings highlight the ongoing importance of fostering collaborative and interdisciplinary research and suggest that educational policies should incorporate insights from bilingualism studies to enhance language acquisition and development.

Introduction

Bilingualism represents a multifaceted and varied life experience that manifests in different social settings. An important feature of multilingual communication is the ability of bilingual speakers to effortlessly adapt to the language preferences of their interlocutors[1]. For example, within a group of bilingual individuals sharing the same linguistic background, language switching typically happens effortlessly, as the context of the conversation allows for flexible language use[2]. Conversely, when interacting with a monolingual speaker, a bilingual individual typically maintains the monolingual's language, switching only when engaging with someone who speaks a different language. Thus, the social context plays a crucial role in determining both the nature and frequency of language switching[3].

The rise of globalization and the changing patterns of migration have led to a growing number of bilingual and multilingual individuals in different regions across the globe[4]. The increasing trends of global mobility and migration have led many individuals and communities to incorporate multiple languages into their everyday communication[5]. Bilingualism, defined as an individual's ability to use two languages simultaneously with similar proficiency in everyday life, has become an increasingly important subject of research in recent decades[6].

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[1] Esti Blanco-Elorrieta and Liina Pylkkänen, "Bilingual Language Switching in the Laboratory versus in the Wild: The Spatiotemporal Dynamics of Adaptive Language Control," *Journal of Neuroscience* 37, no. 37 (2017): 9022–36, https://doi.org/10.1523/JNEUROSCI.0553-17.2017.

[2] Menik Mahmudah, Nurhanifansyah, and Syarif Muhammad Syaheed bin Khalid, "Psycholinguistic Approaches to Enhancing Arabic Speaking Proficiency through Comic Strips," *Arabiyatuna: Jurnal Bahasa Arab* 8, no. 2 (2024): 805–26, https://doi.org/10.29240/jba.v8i2.11349.

[3] Hasnil Oktavera, "Arab Spring and Existence of Arabic Learning in the Multicultural Society of North Sulawesi," *Arabiyatuna : Jurnal Bahasa Arab* 6, no. 2 (2022): 633–50, https://doi.org/10.29240/jba.v6i2.4108.

[4] Arif Ma'mun Rifa'i, "Multilingual Dan Perkembangannya," *Multilingual Dan Perkembangannya Dalam Perspektif Pendidikan* 14, no. 2 (2021): 147–56; Bekir Ince, "Analysis of International Literature on Bilingual and Multilingual Turkish Children by Bibliometric Analysis Technique," *Sakarya University Journal of Education* 12, no. 1 (2022): 256–72, https://doi.org/10.19126/suje.1082446.

[5] Abdul Basid et al., "Intransitive Independent Clauses in Film 'Ḏ Īb': Modern Linguistic Study Based on Kenneth L. Pike's Tagmemic Perspective," *Arabiyatuna: Jurnal Bahasa Arab* 6, no. 2 (2022): 349–74, https://doi.org/10.29240/jba.v6i2.4240.

[6] N Novedo and E R Linuwih, "Code Switching and Code Mixing Used By Sarah Sechan and Cinta Laura in Sarah Sechan Talk Show," *Seminar Nasional Ilmu Terapan*, 2018, 1–8; Annisa Tiara Divina, Dodiet Aditya Setyawan, and Lia Ratih Nurhidayah, "Hubungan Antara Bilingualisme Dengan Kemampuan Bahasa Reseptif Pada Anak Kelas 2 Di Sekolah Dasar (SD)

According to an article published in Ethnologue[7], there are 7,164 languages still in use worldwide today, with nearly half of the world's population being bilingual. This significant phenomenon has become a subject of research in various aspects by different disciplines[8].

Research on bilingualism has shown that the ability to use two languages can provide cognitive benefits, such as improved working memory, cognitive flexibility, and problem-solving skills[9]. Bilingualism, a linguistic phenomenon that has attracted growing interest in recent decades, extends beyond the mere ability to use two languages, encompassing cognitive, social, and educational dimensions as well. Additionally, bilingualism can impact children's language development, particularly in the educational context[10].

Bilingual children tend to have a deeper linguistic understanding and the ability to transfer knowledge between the languages they know[11]. Bilingualism enhances not only language skills but also offers notable cognitive and social advantages. However, further research is essential to explore its impact on individual development and to determine how educational systems can best support bilingual learners. In the era of globalization, collaborative efforts among researchers, educators, and policymakers are crucial to creating a supportive environment for bilingual individuals. Research on bilingualism in the context of the Arabic language is becoming increasingly important due to the rising number of Arabic speakers living in non-Arabic-speaking countries. This growth is fueled by factors such as migration, international education, and mixed marriages.

The Arabic language holds a significant position among the world's languages, particularly in the context of Islam[12]. It has historically served as a

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Negeri 2 Leuweunggajah Cirebon," *Jurnal Terapi Wicara Dan Bahasa* 1, no. 1 (2022): 12–24, https://doi.org/10.59686/jtwb.v1i1.2.

[7] (2022)

[8] Rini, M. Arif Mustofa, and Kurnia, "Using the Plotagon Application on Arabic Language Learning Media Design," *Arabiyatuna: Jurnal Bahasa Arab* 7, no. 2 (2023): 637–54, https://doi.org/10.29240/jba.v7i2.8446.

[9] Rismareni Pransiska, "Kajian Program Bilingual Terhadap Perkembangan Kognitif Anak Usia Dini," *Edukasi Journal* 10, no. 2 (2018): 167–78, https://doi.org/10.31603/edukasi.v10i2.2409; Muhammad Hanif Hukama and Irey Damara, "Pembelajaran Bilingual : Pemerolehan Dan Perkembangan Bahasa Kedua Terhadap Kemampuan Kognitif Anak Bilingual" 3, no. 1 (2024): 119–31.

[10] Tafiati et al., "Lexical Semantics of the Quran : Analysis of Paradigmatic Meaning of Language Politeness," *Arabiyatuna : Jurnal Bahasa Arab* 6, no. 2 (2022): 651–70, https://doi.org/10.29240/jba.v6i2.5067.

[11] Aulia Annisa, "Analisis Perkembangan Sosial Pada Anak Bilingual Di Abad 21," *Mitra Ash-Shibyan: Jurnal Pendidikan Dan Konseling* 4, no. 01 (2020): 31–46, https://doi.org/10.46963/mash.v4i01.223; Pransiska, "Kajian Program Bilingual Terhadap Perkembangan Kognitif Anak Usia Dini."

[12] Sira Abdul Rahman, "Religion and Animal Welfare—An Islamic Perspective," *Animals* 7, no. 2 (2017): 1–6, https://doi.org/10.3390/ani7020011.

medium for cross-border communication and international business[13]. Since 1973, Arabic has been acknowledged as one of the six official languages of the United Nations and is also recognized as an official language by the Organization of African Unity[14]. Additionally, Arabic functions as the official language for both the Muslim World League and the Organization of Islamic Cooperation (OIC). It is also used by the Arab League, which consists of 21 Arab countries, even though not all inhabitants of these countries are Muslim[15]. Therefore, Arabic holds significance not only for communities that speak it as their native language but also for the international community seeking to understand it within a wider global context[16].

Given its global relevance, Arabic has also gained importance in non-Arabic-speaking countries, including Indonesia. Within the broader context of bilingualism and second language acquisition, Arabic holds a distinctive place in Indonesia's educational landscape. Arabic in Islamic Higher Education has a vital position, because the knowledge that dominates in it is Islamic in nature.[17] In the context of Education, Arabic is categorized as a foreign language, as evidenced by its status as a subject rather than a medium of instruction in educational institutions[18]. This positioning aligns with theoretical frameworks on second language acquisition, particularly in contexts where the target language is not part of everyday social interaction and is primarily acquired through formal education rather than natural exposure[19].

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[13] Novita Sari Nasution and Lahmuddin Lubis, "Urgensi Pembelajaran Bahasa Arab Dalam Pendidikan Islam," *Jurnal Simki Pedagogia* 6, no. 1 (2023): 181–91, https://doi.org/10.29407/jsp.v6i1.227; Dany Ardhian et al., "Religious Performance in Malang, Indonesia: Linguistic Landscape on Worship Sign," *Journal of Language and Linguistic Studies* 17, no. 2 (2021): 983–1000, https://doi.org/10.52462/jlls.68.

[14] Abdul Kosim, "Nama-Nama Pesantren Di Bandung Raya," *Kalamuna: Jurnal Pendidikan Bahasa Arab Dan Kebahasaaraban* 2, no. 1 (2021): 1–23, https://doi.org/10.52593/klm.02.1.01; Akhiril Pane, "Urgensi Bahasa Arab; Bahasa Arab Sebagai Alat Komunikasi Agama Islam," *Jurnal Pengembangan Ilmu Komunikasi Dan Sosial* 2, no. 1 (2018): 77–88.

[15] Pane, "Urgensi Bahasa Arab; Bahasa Arab Sebagai Alat Komunikasi Agama Islam."

[16] Ramadhan Safrudin et al., "Development of Arabic Language Learning Research : A Bibliometric Study on Scopus (2009-2024)," *Al-Ta'rib Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab* 12, no. 2 (2024): 321–38, https://doi.org/10.23971/altarib.v12i2.8929.

[17] Noza Aflisia and Renti Yasmar, "Upaya Meningkatkan Kemampuan Bahasa Arab Dosen Non Pendidikan Bahasa Arab," *Ihayul Arabiyah* 2, no. 2 (2018): 157–71, http://jurnal.uinsu.ac.id/index.php/ihya/article/view/3281.

[18] Ahmad Habibi Syahid, "BAHASA ARAB SEBAGAI BAHASA KEDUA (KAJIAN TEORETIS PEMEROLEHAN BAHASA ARAB PADA SISWA NON-NATIVE)," *Arabiyat : Jurnal Pendidikan Bahasa Arab Dan Kebahasaaraban* 2, no. 1 (July 2015): 86–97, https://doi.org/10.15408/A.V2I1.1797.

[19] Ramadhan Safrudin, Siti Sanah, and Sri Dewi Priwarti Siregar, "Research Trends on Writing Skill in Arabic Language; A Bibliometric Analysis," *Aphorisme: Journal of Arabic Language, Literature, and Education* 5, no. 2 (2024): 94–114, https://doi.org/10.37680/aphorisme.v5i2.5442.

The study of language is a broad and distinctive field, closely tied to the human need for social interaction and the diverse conventions of meaning shaped by the contextual nuances of each sentence. The context of a sentence must be present in every human conversation while socializing, along with the spread of language from one community to another, and from one language to another. This demands the ability to master more than one language. The development of language from local language to bilingualism and multilingualism is an inevitable evolution[20]. Thus, bilingualism and multilingualism are compelling subjects of study, as they are dynamic phenomena in human life that continuously evolve, growing more complex and widespread.

Amid the increasing number of bilingual speakers in Arabic, there is a need to understand how bilingualism affects the use and learning of this language. Research shows that bilingual ability can enhance linguistic, cognitive, and social skills, providing significant benefits for individuals and society. Therefore, it is important to explore how bilingualism in Arabic can support cross-cultural communication and contribute to global dynamics.

A significant gap in the literature exists concerning the bibliometric trends in research on bilingualism in Arabic. While previous studies have examined bilingualism from cognitive and sociolinguistic perspectives, a comprehensive bibliometric analysis of research trends, citation patterns, and thematic developments in bilingualism related to Arabic language learning remains unexplored. Recognizing key research trends and collaborations in this area is essential for advancing the field and offering valuable insights to educators, researchers, and policymakers. Therefore, this study seeks to fill this gap by performing a systematic bibliometric analysis of bilingualism research in Arabic from 1986 to 2024.

This study utilizes a bibliometric approach to examine publication trends, citation networks, and research themes within the field of bilingualism and Arabic language learning. Bibliometric analysis provides a systematic method for analyzing extensive academic publication datasets, allowing researchers to identify major contributors, impactful studies, and emerging areas of research. The study will utilize data from Scopus, employing various bibliometric indicators such as citation analysis, co-authorship networks, and thematic mapping to assess the evolution of research in this domain.

The primary objective of this study is to provide a comprehensive overview of research developments in bilingualism and Arabic language learning. Specifically, this study seeks to answer the following research questions:
1. What are the citation patterns in the scientific literature on bilingualism in Arabic during the specified period?

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[20] Rifa'i, "Multilingual Dan Perkembangannya."

2. How are the relevant scientific publications geographically distributed, and what trends exist in international collaboration on bilingualism in Arabic?

3. What is the distribution of journal rankings for publications on bilingualism in Arabic according to quartile categories?

4. What are the primary research themes in the scientific literature on bilingualism in Arabic from 1986 to 2024?

By addressing these questions, this study aims to contribute valuable insights into the research landscape of bilingualism in Arabic. The findings will help to clarify research trends, highlight existing gaps, and guide future directions in the field. Additionally, the study will provide essential information for educators and policymakers to develop effective strategies for Arabic language instruction in bilingual contexts.

This study employs a quantitative approach through bibliometric analysis to investigate research trends in bilingualism in the Arabic language[21]. The primary source of data is the Scopus database, which was selected due to its extensive interdisciplinary coverage, frequent updates, and continuous refinement in indexing academic publications. Scopus stands as one of the most reputable abstract and citation databases, alongside Web of Science and Google Scholar[22,23]. Scopus is chosen for its ability to offer comprehensive metadata, access to high-impact peer-reviewed journals, and its capacity to track the development of scholarly discourse across disciplines related to bilingualism in the Arabic language.

The initial phase of data collection involved a search query using the keywords "Bilingual" and "Arabic language" in the Scopus search engine. This identification process yielded a total of 146 publications. The second phase consisted of a data screening process aimed at refining the dataset. The screening process excluded document types like books, book chapters, and conference proceedings. Additionally, only peer-reviewed scientific articles published in English were considered. As a result of this screening, 132 articles met the inclusion criteria and were selected for further analysis. The dataset was finalized on June 9, 2024, marking the completion of the inclusion stage. These stages are illustrated in Figure 1[24].

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[21] Allan Pritchard, "Statistical Bibliography or Bibliometrics," *Journal of Documentation* 25 (1969): 348.

[22] Manoj Kumar Kamila and Sahil Singh Jasrotia, "Ethics and Marketing Responsibility : A Bibliometric Analysis and Literature Review," *Asia Pacific Management Review* 28, no. 4 (2023): 567–83, https://doi.org/10.1016/j.apmrv.2023.04.002.

[23] Luca Mora, Roberto Bolici, and Mark Deakin, "The First Two Decades of Smart-City Research : A Bibliometric Analysis," *Journal of Urban Technology* 24, no. 1 (2017): 3–27, https://doi.org/10.1080/10630732.2017.1285123.

[24] D Moher, "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement (Chinese Edition)," *Journal of Chinese Integrative Medicine* 7, no. 9 (September 2009): 889–96, https://doi.org/10.3736/jcim20090918.
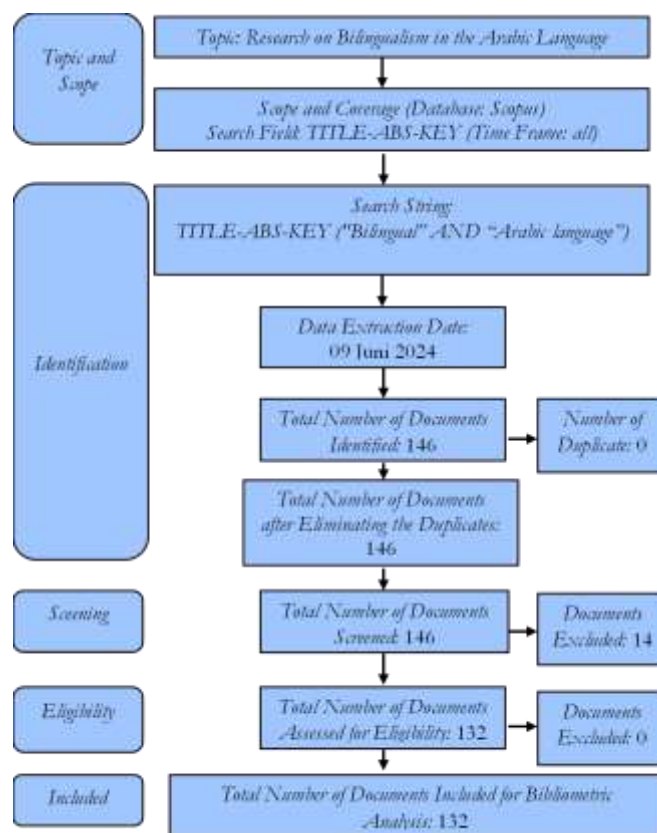
Figure 1. Data Collection Process

To analyze the dataset, various analytical tools were employed. Microsoft Excel facilitated the compilation, tabulation, and visualization of annual publication and citation trends, enabling clear year-by-year segmentation for better interpretation. Publish or Perish (PoP) software was used to calculate the h-index and g-index to measure the productivity and impact of the publications[25]. In addition, Excel was also employed to map the geographic origin of the publications and classify journals into quartiles (Q1 to Q4) based on Scimago Journal & Country Rank (Scimagojr), thereby reflecting the quality and reputation of the publication sources. To explore international collaboration and co-authorship networks, VOSviewer software was used. This tool is particularly effective in visualizing bibliometric networks and detecting thematic clusters through keyword co-occurrence analysis.

The bibliometric data were then subjected to quantitative analysis using several tools. Microsoft Excel was employed to calculate and graphically visualize the annual number of publications and their average citations per year between

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[25] Anne-Wil Harzing, "Publish or Perish Explains the Use of Publish or Perish and Its Metrics," Research in International Management, 2023.

1986 and 2024. These visualizations will help to reveal trends and shifts in the volume and impact of research over time.

To assess scholarly productivity and citation impact, the study used the Publish or Perish (PoP) software. The h-index, introduced by Hirsch (2005)[26], and the g-index, developed by Egghe (2006)[27], were calculated. The h-index evaluates both the productivity and the citation impact of an author's or journal's work, whereas the g-index assigns greater weight to highly cited papers, offering a more nuanced assessment of scholarly influence. PoP, developed by Harzing (2007)[28], supports the retrieval and analysis of citation metrics from multiple databases, including Google Scholar, Scopus, Web of Science, and CrossRef, making it a reliable tool for comprehensive bibliometric evaluation.

Furthermore, VOSviewer was utilized to conduct network analysis of international collaborations in the dataset. This software excels in creating and visualizing bibliometric networks, such as co-authorship and keyword co-occurrence maps. Using VOSviewer, the study uncovers collaborative relationships among researchers and institutions, along with the primary themes emerging within the field.

In addition to analyzing authorship and thematic networks, the study also classifies journal quality based on quartile rankings (Q1-Q4), using Scopus metrics. These classifications offer insights into the distribution of research output among journals with different impact levels, thereby contextualizing the visibility and academic significance of the published studies.

Despite the strengths of using Scopus, the study acknowledges potential limitations and biases, such as the exclusion of non-indexed regional or national journals that might offer valuable insights into bilingualism in the Arabic language. This limitation could influence the generalizability of findings, and thus, interpretations will remain cautious and critically reflective.

By integrating these methods, the research offers a multidimensional perspective on the landscape of bilingualism studies in Arabic, encompassing publication trends, citation dynamics, scholarly networks, geographical contributions, and journal prestige, all through the lens of a rigorous quantitative bibliometric framework.

Findings and Discussion

Publications related to bilingualism in the Arabic language have undergone several stages in the data collection process. Through this process, the authors identified 132 relevant publications from 1986 to 2024 that meet the

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[26] J E Hirsch, "An Index to Quantify an Individual's Scientific Research Output.," *Proceedings of the National Academy of Sciences of the United States of America* 102, no. 46 (November 2005): 16569–72, https://doi.org/10.1073/pnas.0507655102.

[27] Leo Egghe, "Theory and Practise of the G-Index," *Scientometrics* 69, no. 1 (2006): 131–52, https://doi.org/10.1007/s11192-006-0144-7.

[28] Harzing, "Publish or Perish Explains the Use of Publish or Perish and Its Metrics."

research criteria. The subsequent step is to conduct a descriptive bibliometric analysis. The authors will review publication trends, citation trends, geographic distribution, journal rankings, and delve deeper into research focus in the subsequent analysis phase.

Publication Trends

The publication trends related to bilingualism in the Arabic language during the period from 1986 to 2024 will be illustrated in Figure 2. Data from the 132 publications categorized by year of publication will be presented in tabular form, as shown in Figure 2. Below:
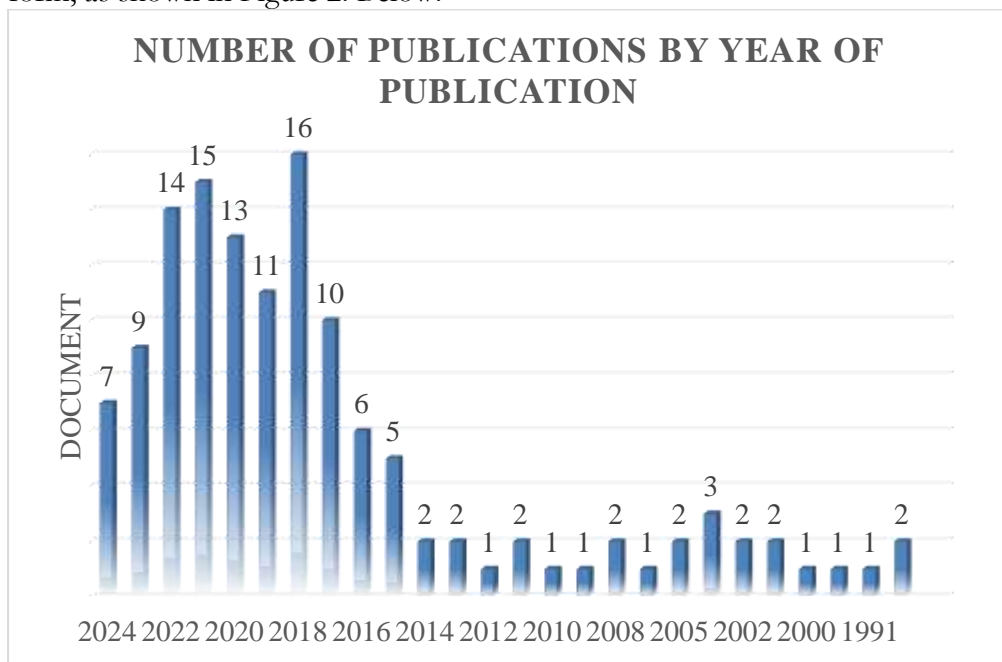

Figure 2. Number of Publication

Figure 2 shows that in 2018, there were 16 documents published. The earliest articles on bilingualism in the Arabic language appeared in the Scopus database in 1986. Between 1986 and 1999, there were only two publications, one in 1991 and another in 1993, with each year producing a single document.

Citation Trends

The citation trends related to bilingualism in the Arabic language from 1986 to 2024 will be presented in Table 1. The total of 132 collected publications will show the number of publications each year categorized according to parameters such as NCP, TC, C/P, C/CP, h-index, and g-index. This information will be presented in Table 1 below:

Table 1. Citation Analysis of Publications

Year	T	NCP	TC	C/P	C/CP	h	g
2024	7	3	5	0,71	1,67	2	2
2023	9	4	6	0,67	1,5	2	2
2022	14	9	28	2,00	3,1	4	4
2021	15	13	112	7,47	8,61	7	10
2020	13	12	75	5,77	6,25	5	8
2019	11	11	53	4,82	4,81	4	6
2018	16	14	95	5,94	6,78	6	9
2017	10	10	348	34,80	34,8	7	10
2016	6	6	41	6,83	6,83	4	6
2015	5	4	89	17,80	22,25	4	5
2014	2	1	7	3,50	7	1	2
2013	2	2	9	4,50	4,50	2	2
2012	1	-	-	-	-	-	-
2011	2	2	12	6,00	6,00	2	2
2010	1	1	3	3,00	3,00	1	1
2009	1	1	14	14,00	14,00	1	1
2008	2	2	48	24,00	24,00	2	2
2007	-	-	-	-	-	-	-
2006	1	1	21	21,00	21,00	1	1
2005	2	1	4	2,00	4	1	2
2004	3	2	7	2,33	3,5	1	2
2003	-	-	-	-	-	-	-
2002	2	1	3	1,50	3	1	1
2001	2	2	53	25,50	26,5	2	2
2000	1	1	1	1,00	1,00	1	1
1999	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-
1993	1	-	-	-	-	-	-
1992	-	-	-	-	-	-	-
1991	1	1	1	1,00	1,00	1	1
1990	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-
1986	2	-	-	-	-	-	-

Notes. TP=total of publication, NCP=number of cited publication, TC=total citations, C/P=average citations per publication, C/CP=average citations per cited pblication, h=h-index, g=g-index

Table 1 reveals that the peak number of cited documents (NCP) was in 2018, with an NCP of 14. The highest citation count during the 1986-2024 period occurred in 2017, totaling 348 citations. Although 2018 had the most publications, with 16, 2017 had a greater research impact. Additionally, Table 1 shows that

there were several years without citations or publications, specifically between 1987-1990 and 1994-1999.

Furthermore, the peak h-index and g-index values were recorded in 2017 and 2021, with the h-index reaching 7 and the g-index 10, highlighting the substantial influence of publications from these years within the research field. In 2017, there were 10 publications that collectively received 348 citations, averaging approximately 30 citations per publication. Similarly, in 2021, 13 publications were cited a total of 112 times, averaging about 10 citations per publication.

Geographical Distribution and Inter-Country Relations

Figure 3 shows the geographic distribution of the countries of origin of authors contributing to publications related to bilingualism in the Arabic language. A total of 39 countries participate in these publications, and the geographic distribution of the authors' origins is illustrated in the following figure.
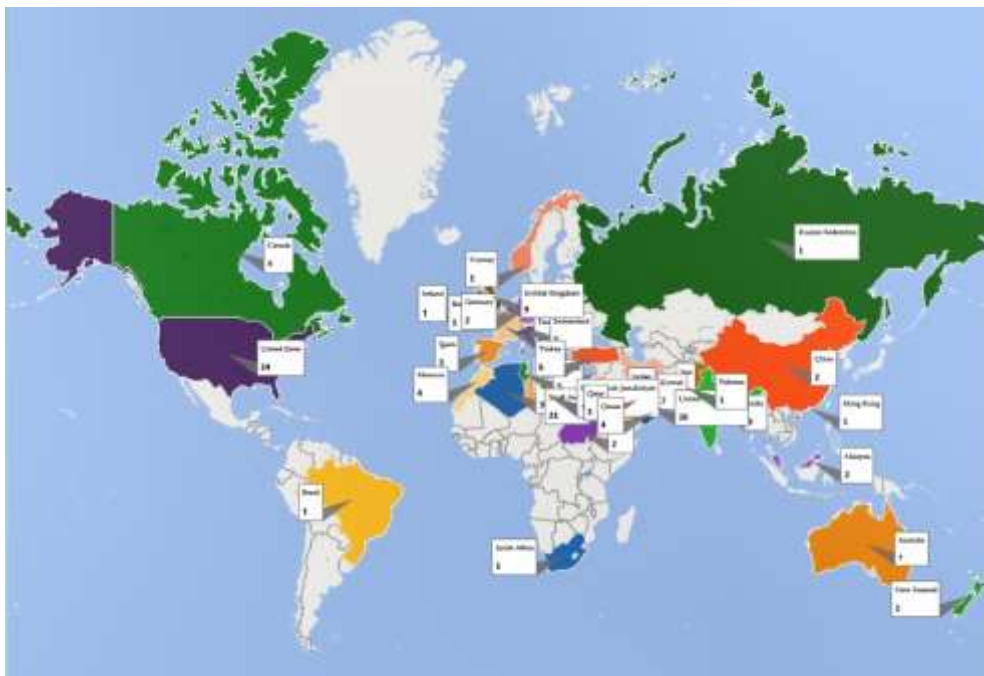

Figure 3. Geographic Distribution of Publications

Based on the data presented in Figure 3, it is evident that the United States is the leading country in research related to bilingualism in the Arabic language, having published a total of 24 documents in this field. Closely following the United States is Saudi Arabia, which stands as the second most influential country with 21 relevant publications on bilingualism in the Arabic language. The third country playing a significant role in this research is the United Arab Emirates, with 16 publications.

International Collaboration Patterns

The pattern of international collaboration is depicted in Figure 4. In analyzing these inter-country relationships, the researchers did not impose a specific threshold. Thus, countries with just one document are included, even if they may not have collaborated with other countries. A total of 39 countries are featured in Figure 4
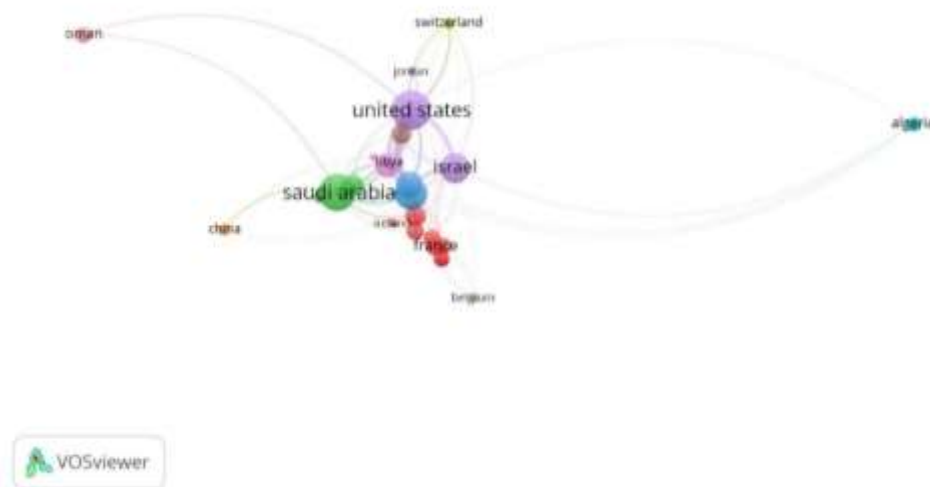

Figure 4. International Collaboration

In Figure 4, it can be observed that the United States, Saudi Arabia, United Arab Emirates, and Israel are represented by circles with larger diameters compared to other countries. This indicates a higher level of collaboration with other countries in this field. Using VOSviewer visualization, it is evident that the United States and Saudi Arabia collaborate with 18 countries, while the United Arab Emirates collaborates with 20 countries, and Israel collaborates with 16 countries in the context of bilingualism in the Arabic language.

Distribution of Journal Rankings

In the context of relevant journals on bilingualism in the Arabic language, information regarding journal rankings based on quartile (Q) values can be found on the Scimagojr website. Details of these journal rankings are illustrated in the graph in Figure 5 below.
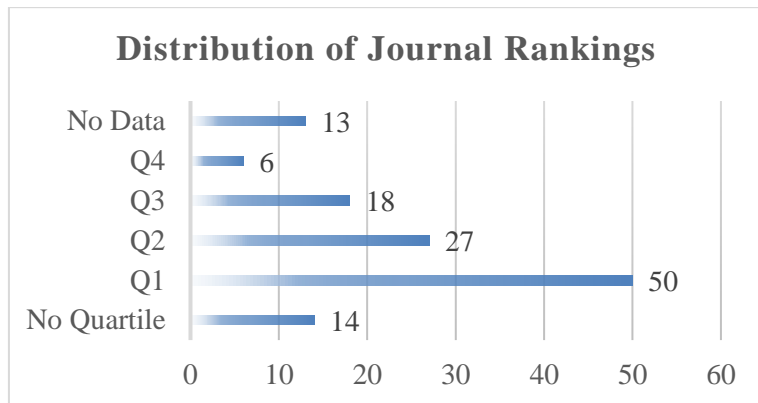
Figure 5. Journal Ranking Based on Quartile Values

According to Figure 5, it is evident that publications related to bilingualism in the Arabic language are predominantly found in Q1-ranked journals, totaling 50 journals. The second highest number of publications is in Q2-ranked journals, with a total of 27 journals. Additionally, publications are spread across Q3 and Q4 journals, with 18 and 6 journals respectively. Moreover, 14 journals fall under the No Quartile (Q) category, while data for 13 journals could not be retrieved from the Scimagojr database. The prominence of Q1 journals underscores the importance of quality research in the field of bilingualism in the Arabic language.

Research Focus

At this stage, the researchers have set a specific threshold where each keyword must appear in at least 5 publications. Using this criterion, all keywords included will be identified and displayed through the use of VOSviewer. A total of 51 keywords have emerged, as depicted in Figure 6.
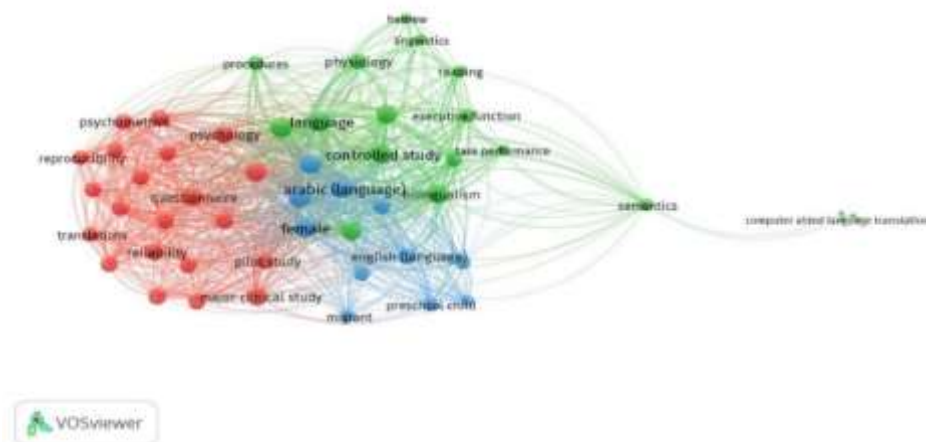

Figure 6. Research Focus

The research focus can be discerned from the clusters shown in the figure, which are divided into three distinct groups, each represented by different colors: red, green, and blue. These clusters highlight various aspects of bilingualism research in the Arabic language.

1. The first cluster (red) contains 21 items, with "Questionnaire" as a central keyword. This indicates that research in this cluster primarily revolves around using questionnaires to study bilingualism in Arabic.

2. The second cluster (green) includes 19 items, centered around the keyword "Human." This suggests that the research focus is on human-related aspects within the context of Arabic bilingualism.

3. The third cluster (blue) comprises 11 items, dominated by the keyword "Language." This indicates a primary research focus on language itself in the study of bilingualism in Arabic.

What are the citation patterns in the scientific literature on bilingualism in Arabic during the specified period?

The citation patterns for bilingualism in the Arabic language are highlighted by the TC values in Table 1. In 2017, publications received 348 citations, with notable h-index and g-index values of 7 and 10, respectively. This suggests that the research from 2017 had a considerable influence on studies concerning Arabic bilingualism. Additionally, Table 3 lists the top 10 most-cited articles published in 2017.

Table 3. Articles Published in 2017

No	Title	Sources	Citation
1	*Bilingual language switching in the lab vs. in the wild: The spatio-temporal dynamics of adaptive language control*[29]	Journal of Neuroscience	138
2	*Psychometric Properties of an Arabic Version of the Depression Anxiety Stress Scales (DASS)*[30]	Research on Social Work Practice	127
3	*Is susceptibility to cross-language interference domain specific*[31]	Cognition	30
4	*Validation and adaptation of the hospital consumer assessment of*	Journal of Infection and Public Health	12

[29] Blanco-Elorrieta and Pylkkänen, "Bilingual Language Switching in the Laboratory versus in the Wild: The Spatiotemporal Dynamics of Adaptive Language Control."

[30] Miriam Taouk Moussa et al., "Psychometric Properties of an Arabic Version of the Depression Anxiety Stress Scales (DASS)," *Research on Social Work Practice* 27, no. 3 (2017): 375–86, https://doi.org/10.1177/1049731516662916.

[31] Anat Prior et al., "Is Susceptibility to Cross-Language Interference Domain Specific?," *Cognition* 165 (2017): 10–25, https://doi.org/10.1016/j.cognition.2017.04.006.

	healthcare providers and systems in Arabic context: Evidence from Saudi Arabia[32]		
5	*Assessing Lebanese bilingual children: The use of cross-linguistic lexical tasks in Lebanese Arabic*[33]	Clinical Linguistics & Phonetics	10
6	*How Does the Linguistic Distance Between Spoken and Standard Language in Arabic Affect Recall and Recognition Performances During Verbal Memory Examination*[34]	Journal of Psycholinguistic Research	9
7	*Evaluation of English to Arabic Machine Translation Systems using BLEU and GTM*[35]	ACM International Conference Proceeding Series	7
8	*Integrating Bilingual Named Entities Lexicon with Conditional Random Fields Model for Arabic Named Entities Recognition*[36]	Proceedings of the International Conference on Document Analysis and Recognition, ICDAR	7
9	*Translation and cultural adaptation of the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) pain scale into Arabic for use with patients with diabetes in Libya*[37]	Libyan Journal of Medicine	7

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[32] Mohammed R. Alanazi, Ahmed Alamry, and Khaled Al-Surimi, "Validation and Adaptation of the Hospital Consumer Assessment of Healthcare Providers and Systems in Arabic Context: Evidence from Saudi Arabia," *Journal of Infection and Public Health* 10, no. 6 (2017): 861–65, https://doi.org/10.1016/j.jiph.2017.02.002.

[33] Christel Khoury Aouad Saliby et al., "Assessing Lebanese Bilingual Children: The Use of Cross-Linguistic Lexical Tasks in Lebanese Arabic," *Clinical Linguistics & Phonetics* 31, no. 11–12 (2017): 874–92, https://doi.org/10.1080/02699206.2017.1308554.

[34] Haitham Taha, "How Does the Linguistic Distance Between Spoken and Standard Language in Arabic Affect Recall and Recognition Performances During Verbal Memory Examination," *Journal of Psycholinguistic Research* 46, no. 3 (2017): 551–66, https://doi.org/10.1007/s10936-016-9453-z.

[35] Aljoharah Al-Rukban and Abdul Khader Jilani Saudagar, "Evaluation of English to Arabic Machine Translation Systems Using BLEU and GTM," *ACM International Conference Proceeding Series*, 2017, 228–32, https://doi.org/10.1145/3175536.3175570.

[36] Emna Hkiri, Souheyl Mallat, and Mounir Zrigui, "Integrating Bilingual Named Entities Lexicon with Conditional Random Fields Model for Arabic Named Entities Recognition," *Proceedings of the International Conference on Document Analysis and Recognition, ICDAR* 1 (2017): 609–14, https://doi.org/10.1109/ICDAR.2017.105.

[37] Sabri Garoushi, Mark I. Johnson, and Osama A. Tashani, "Translation and Cultural Adaptation of the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) Pain Scale into Arabic for Use with Patients with Diabetes in Libya," *Libyan Journal of Medicine* 12, no. 1 (2017), https://doi.org/10.1080/19932820.2017.1384288.

10	*Building Bilingual Algorithm English-Arabic Ontology For Cognitive Applications*[38]	Proceedings - 2017 IEEE 1st International Conference on Cognitive Computing, ICCC 2017	1

Table 3 above illustrates that the study conducted by researchers Blanco-Elorrieta & Pylkkänen[39] has received 138 citations, indicating that the research had a significant impact that year. The study, titled "Bilingual language switching in the lab vs. in the wild: The spatio-temporal dynamics of adaptive language control," investigates the neural mechanisms that enable multilingual individuals to adapt to different conversational contexts during speaking and listening. The research compares language control in structured laboratory settings with more spontaneous natural conversational contexts. Using Magnetoencephalography (MEG), the study examines brain activity during language production and comprehension tasks under two conditions: a controlled laboratory setting, where participants switch languages based on instructions, and a natural conversation setting, where they listen to authentic dialogue excerpts between Arabic-English bilinguals.

The main findings indicate that activity in the anterior cingulate cortex (ACC) is more significant when switching languages under external control compared to natural and voluntary language switching. Additionally, during natural conversations, language switching involves minimal engagement of the prefrontal control regions. In language production, two significant interaction clusters emerge in the left anterior cingulate cortex and the dorsolateral prefrontal cortex, particularly between 100 and 300 milliseconds after stimulus onset. Meanwhile, language comprehension shows notable activity clusters in the same regions at the onset of auditory words, highlighting the primary effect of language switching. Multivariate pattern analysis (MVPA) indicates that the representation of the interlocutor's identity remains throughout the experiment in language production but fades and re-emerges in language comprehension. The identity of the interlocutor is extracted from linguistic cues and used during lexical retrieval in both production and comprehension. Bilingual speakers show sensitivity to the type of discourse constraints containing language switching, while monolingual speakers do not exhibit such sensitivity. Activity increased in the auditory cortex for English compared to Arabic in monolingual participants, indicating greater engagement with the more familiar language.

This study demonstrates that the interactional context significantly influences the engagement of language control networks. Language switching

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[38] Amany Alnahdi, Rania Aboalela, and Amal Babour, "Building Bilingual Algorithm English-Arabic Ontology for Cognitive Applications," *Proceedings - 2017 IEEE 1st International Conference on Cognitive Computing, ICCC 2017*, 2017, 124–27, https://doi.org/10.1109/IEEE.ICCC.2017.22.

[39] (2017)

under external control necessitates greater involvement from prefrontal control regions, whereas natural and voluntary language switching does not. These findings challenge conclusions from artificial switching paradigms that assert language switching is always demanding. Furthermore, the results suggest that the "bilingual advantage" is confined to individuals who must manage their languages based on external cues, and it does not arise solely from bilingual experience with free switching.

The second most cited study is conducted by Moussa et al.[40], titled "Psychometric Properties of an Arabic Version of the Depression Anxiety Stress Scales (DASS)." This study examines the translation and psychometric evaluation of the Arabic version of the Depression Anxiety Stress Scales (DASS). In this research, DASS items were translated and tested on a sample of immigrants in Australia, showing that the Arabic version of DASS can distinguish between depression, anxiety, and stress, though this discrimination is not as strong as in the English version. Factor analysis showed that the factor loadings for all 42 items in the Arabic version closely matched those in the English version, demonstrating effective translation and adaptation. Each scale exhibited high internal consistency, confirming the instrument's reliability. Analysis of a bilingual sample indicated that English norms are applicable to the Arabic version of the DASS, supporting its cross-cultural validity. The findings also suggest that depression, anxiety, and stress are universal experiences across cultures. Overall, the Arabic version of the DASS displayed strong psychometric properties for assessing negative emotions in Arabic-speaking populations, both clinical and non-clinical. In conclusion, the Arabic version of DASS is a valid tool for assessing depression, anxiety, and stress among Arabic-speaking populations, providing initial evidence that the psychometric properties of DASS can be applied across cultures, highlighting the importance of considering cultural issues in the translation and adaptation of psychological instruments. This article is significant as it provides a validated tool for measuring negative emotions in Arabic-speaking populations, enabling more accurate and culturally relevant assessments and more effective interventions in the context of mental health. The findings in this article enrich our understanding of how adaptive language control operates in different situations, which is highly relevant for bilingual communities, including those in the Arab world. By understanding that language control strategies can change based on context, we can develop more effective approaches to support bilingualism and address challenges that may arise in everyday language use.

The next study with the highest number of citations is the one conducted by Prior et al.[41], titled "Is susceptibility to cross-language interference domain

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[40] (2017)
[41] (2017)

specific?" This article explores research on the impact of cross-language interference on bilingual individuals who use two languages with distinct orthographic systems, such as Arabic and Hebrew. The study, conducted by Anat Prior, Tamar Degani, Sehrab Awawdy, Rana Yassin, and Nachshon Korem from the University of Haifa, Israel, aims to evaluate the extent of cross-language interference in bilinguals using languages with different orthographies. The study also explores whether the capacity to manage interference in lexical and grammatical domains is interconnected and examines if individual differences in interference control relate to overall cognitive control abilities. The study involved 70 Arabic-Hebrew bilingual students who performed two tasks to measure cross-language interference: a semantic similarity judgment task to assess lexical interference, where participants evaluated the semantic similarity of Hebrew words involving false cognates, and a self-paced reading and grammaticality judgment task to measure syntactic interference, where participants read sentences in Hebrew and judged their grammaticality. Executive control ability was assessed using spatial and numerical Stroop tasks and a task-switching paradigm to measure shifting ability.

The study's main findings reveal L1 interference in both lexical and grammatical domains; however, these interference effects are not correlated, implying distinct mechanisms for managing interference in each domain. Additionally, no connection was found between interference control in either domain and general executive control abilities, suggesting that managing cross-language interference may be domain-specific rather than reliant on overall cognitive control. The ability to manage grammatical interference, but not lexical interference, decreased with increasing proficiency in the second language (L2), suggesting that higher proficiency in the second language can reduce interference in the grammatical domain.

These findings have several important implications. They suggest that the management of cross-language interference is not uniform across linguistic domains and is not necessarily tied to general cognitive abilities. Instead, interference appears to be more contextually and structurally specific, especially in bilinguals with distinct orthographic systems such as Arabic and Hebrew. This nuanced understanding contributes to the development of more targeted strategies in second language instruction, particularly in improving syntactic control in advanced learners.

Furthermore, the increasing number of publications and citations in this area, as shown in the bibliometric analysis, mirrors a broader shift in the field toward recognizing the complexity and diversity of bilingual experiences. Earlier research frequently treated bilingualism as a uniform phenomenon; however, recent influential studies—including this one—highlight increasing recognition of how linguistic typology, language structure, and individual differences influence bilingual processing. Bibliometric trends mirror this evolution, as the field shifts

from broad, generalized models toward more detailed, domain-specific analyses. In this context, highly cited studies like that of Prior et al. not only highlight novel empirical findings but also signal a collective progression in scholarly understanding—one that appreciates the multifaceted and dynamic nature of bilingual language control.

How are the relevant scientific publications geographically distributed, and what trends exist in international collaboration on bilingualism in Arabic?

In the study of bilingualism in Arabic, several countries notably contribute to the research, with the United States, Saudi Arabia, the United Arab Emirates, and Israel leading the field. Of these, the United States occupies the foremost position, producing 24 publications on Arabic bilingualism. This trend is consistent with historical developments, such as the research findings by Mauidlotun Nisa[42], which highlight the role of the Ford Foundation in 1957. The Foundation awarded grants to fund summer programs at various U.S. universities, allowing students to study Arabic. These universities included Columbia, Harvard, Johns Hopkins, Michigan, and Princeton, with study locations rotating from 1957 to 1961. From 1962 to 1968, the grants were extended to the University of California, Georgetown, and the University of Texas. These programs contributed to the development of innovative teaching methods emphasizing modern and idiomatic Arabic. The strategic significance of the Middle East—particularly in energy production, economic influence, and security—greatly fueled growing interest among U.S. residents in learning Arabic. This interest is evident in the sharp increase in enrollment for Arabic language courses, which has more than doubled according to a recent Modern Language Association survey. Arabic is now one of the top 10 most studied foreign languages in the United States. One of the key objectives of studying Arabic in the U.S. is to foster greater communication with the Arab world, and universities like the University of Texas and Georgetown have developed prominent Arabic programs, with new programs being established each year.

International collaboration is also a key feature of the research landscape in bilingualism in Arabic. Based on Figure 4, three countries, the United States, Saudi Arabia, and the United Arab Emirates- have the highest level of collaboration with 35 other countries in this field. The United Arab Emirates, for example, is linked with 20 other countries in research on bilingualism in Arabic, reflecting its central role in facilitating global academic exchanges. Countries such as Jordan play a vital role in promoting these collaborations, engaging closely with 20 other nations in bilingualism research. This international cooperation highlights the significance of cross-cultural academic exchanges in advancing the study of bilingualism and the use of Arabic across diverse contexts.

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[42] (2022)

Beyond these leading countries, other nations, particularly those in the Arab world, contribute to the growing body of research on bilingualism in Arabic. Countries such as Egypt, Lebanon, and Morocco possess longstanding traditions of bilingual education and linguistic research, particularly concerning Arabic-French and Arabic-English bilingualism. These nations contribute valuable insights to the field, especially regarding language contact and the influence of colonial history on language practices. Additionally, European countries such as France and the United Kingdom, with significant Arabic-speaking populations, also contribute to the growing literature on Arabic bilingualism, particularly in terms of sociolinguistic studies, language acquisition, and the cognitive effects of bilingualism. This broad international collaboration reflects a global effort to understand bilingualism in Arabic and its implications for both linguistic theory and practical applications in education, psychology, and cognitive science.

What is the distribution of journal rankings for publications on bilingualism in Arabic according to quartile categories?

The distribution of journal rankings is assessed based on quartile (Q) values. Out of a total of 132 publications, 50 of them appeared in journals ranked Q1. The authors present this information in Table 4 below, displaying only journals with more than 1 publication. For further details, please refer to Table 4.

Table 4. Journals with the most articles

Journals Name	Articles Number	Quartile
Journal of Cross-Cultural Psychology	2	Q1
Electronic Library	2	Q2
Saudi Pharmaceutical Journal	2	Q2
Egyptian Journal of Otolaryngology	2	Q3
International Journal of Advanced Computer Science and Applications	2	Q3
ACM International Conference Proceeding Series	2	No Quartil
Colloquium in Information Science and Technology, CIST Applications	2	No Quartil
Procedia Computer Science	2	No Quartil
Proceedings of the International Conference on Document Analysis and Recognition, ICDAR	2	No Quartil

In Table 4 above, it is evident that the top two journals have each published 2 articles related to Bilingualism in Arabic. Furthermore, the list of journals above can serve as a reference for future publications in the field of Bilingualism in Arabic.

What are the primary research focuses in the scientific literature on bilingualism in Arabic from 1986 to 2024?

The research focus related to bilingualism in Arabic is divided into three parts: 1) Questionnaire; 2) Human; and 3) Adult.

The focus of the first study is the Questionnaire, as seen in the research conducted by Alqarni & Dewaele[43]. This study shows that bilingualism can provide emotional advantages in emotion perception in the second language (L2), but these advantages are not observed in the first language (L1). Trait Emotional Intelligence (Trait EI) significantly influences the ability to recognize emotions, with individuals scoring higher in Trait EI demonstrating superior performance in emotion perception tasks. The study also revealed that Arabic-English bilinguals have higher Trait EI scores than monolinguals, potentially explaining their enhanced ability to recognize emotions in English. These results underscore the importance of psychological factors in understanding the emotional advantages of bilingualism. To measure participants' Trait EI, the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF) was used. The TEIQue-SF is a psychometric instrument consisting of a number of statements that assess various aspects of emotional intelligence, such as the ability to identify, understand, manage, and use emotions effectively. It can be concluded that this questionnaire plays a crucial role in identifying the relationship between bilingualism and emotional advantages. The data collected helps to reveal that Arabic-English bilinguals have an advantage in recognizing emotions in English and that Trait EI significantly contributes to this ability. Additionally, the questionnaire allows researchers to gather detailed information about participants' language background and language use, which is essential for understanding the context of their bilingualism.

The second research focus is on Human, as observed in the study by Ali and colleagues[44]. This article introduces TOIA (Time-Offset Interaction Application), a bilingual (Arabic-English) interactive human avatar dialogue system, which allows users to create a personal digital avatar to simulate cross-cultural and intergenerational face-to-face conversations. The system comprises two main components: the avatar creator who wishes to create a personal avatar, and the interactor who engages with the avatar. TOIA is designed to overcome temporal and spatial limitations in face-to-face interactions, enabling dialogues at the user's convenience and supporting cross-linguistic interactions between the user and the avatar. In the context of the relationship between bilingual humans and the Arabic language, TOIA supports cross-linguistic dialogue using synsets for English and synthetic synsets for Arabic, along with morphological analysis using the Standard Arabic Morphological Analyzer (SAMA). Preliminary

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[43] (2020)
[44] (2018)

assessments show positive results in accuracy, comprehension, interaction speed, timely responses, and conversation flow, with 85% of users enjoying the interaction and 60% expressing interest in further engagements with the avatar. In conclusion, this study presents TOIA, a bilingual interactive human avatar system supporting dialogue in both Arabic and English. This system allows users to create and interact with digital avatars, promoting cross-cultural and intergenerational communication. TOIA overcomes temporal and spatial constraints in human interaction, supports cross-linguistic dialogue, and provides a platform for sharing life stories. The findings suggest that TOIA can enhance cross-cultural understanding and offer a useful tool for language and cultural learning. Preliminary evaluations show that users are satisfied with the system and perceive it as a valuable tool for further interaction.

The primary research focus is on adults. This article examines the role of the first language (L1), Arabic, in teaching English as a Foreign Language (EFL) in Saudi Arabia, involving 40 teachers and 60 students selected through stratified random sampling. The main findings reveal that both teachers and students favor a cautious bilingual approach. Arab EFL teachers tend to use Arabic more frequently than their non-Arab counterparts, who employ it more strategically and appropriately. Notable differences were observed in beliefs about first language use, with Arab EFL teachers relying more heavily on Arabic. The study concludes that a deliberate and thoughtful integration of Arabic in English language teaching can improve instructional effectiveness in Saudi Arabia. The use of Arabic in EFL classrooms has been shown to benefit bilingual adult students by making them more relaxed and better able to comprehend English. Arabic helps students understand the structural differences between English and Arabic, saves time, and increases student motivation for learning. In conclusion, this study underscores that the use of Arabic in EFL classrooms offers several advantages for bilingual adult students, making them feel more at ease and better able to understand English when Arabic is used judiciously by teachers[45]. The study suggests that the strategic and controlled use of Arabic does not diminish students' exposure to English; rather, it can improve their understanding of the material. Furthermore, utilizing Arabic can save time and offer clearer explanations of the structural differences between English and Arabic. Both teachers and students concur that the prudent use of Arabic can improve the effectiveness of English teaching and learning in EFL classrooms.

Conclusion

This study offers a comprehensive bibliometric analysis of research trends in Arabic bilingualism from 1986 to 2024. The findings reveal a notable increase

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[45] Iftikhar Ahmad, Noor Raha Mohd Radzuan, and Muhammad Sabboor Hussain, "Use of First Language in the Classroom: Non-Native EFL Teachers' Beliefs in Teaching English to Adult Learners in Bilingual Context," *Arab World English Journal* 9, no. 2 (2018): 53–54.

in both the volume and impact of scholarly work, with a significant rise in publications beginning in the mid-2000s and a peak in citations occurring in 2017. This trajectory reflects a growing academic recognition of the complexity of bilingualism, shifting from generalized cognitive inquiries to more nuanced, domain-specific investigations into cross-language interference, emotional perception, and educational strategies. The citation patterns highlight the impact of seminal studies that question traditional models of bilingual advantage, emphasizing the importance of contextual, cultural, and psycholinguistic factors.

Geographically, the United States emerges as the most prolific contributor, owing in part to longstanding institutional investments and global strategic interests in Arabic language education. However, countries like Saudi Arabia, the United Arab Emirates, and Israel also show significant involvement and international collaboration, reflecting broader global engagement in the field. Notably, the growing participation of nations throughout the Arab world and Europe highlights the transnational importance of Arabic bilingualism, particularly in multilingual societies influenced by migration, colonial histories, and educational reforms.

Despite its strengths, this study acknowledges several limitations. The exclusive reliance on Scopus-indexed journal articles may exclude valuable regional or non-English language scholarship, potentially narrowing the representation of Arabic bilingualism research. Moreover, while bibliometric analysis offers robust quantitative insights, it does not capture the full depth of methodological diversity or theoretical innovation within individual studies. Future research could benefit from integrating bibliometric findings with qualitative content analysis to provide a more holistic understanding of scholarly discourse.

In conclusion, this study advances the field by identifying major publication trends, charting international collaborations, and highlighting key thematic developments in Arabic bilingualism research. The results underscore the importance of interdisciplinary and cross-cultural approaches in advancing the field. For educators and policymakers, the findings offer empirical grounding for designing bilingual education initiatives that harness the cognitive, social, and linguistic advantages of bilingualism. Continued inquiry, particularly through longitudinal and mixed-methods studies, will be essential to deepen our understanding of how Arabic bilingualism shapes learning, identity, and social integration across diverse contexts.

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