The Implications of Global English for Language Endangerment and Linguistic Identity: The Case of Arabic in the GCC States

Naser M. N. Alzaben¹, Abdulfattah Omar¹,² & Mohamed Ali Mohamed Kassem¹,³

¹ Department of English, College of Science & Humanities, Prince Sattam Bin Abdulaziz University, Saudi Arabia
² Department of English, Faculty of Arts, Port Said University, Egypt
³ Faculty of Education, New Valley University, Egypt

Correspondence: Abdulfattah Omar, Department of English, College of Science & Humanities, Prince Sattam Bin Abdulaziz University, Al-Kharj, Riyadh, 11942, Saudi Arabia. E-mail: a.abdelfattah@psau.edu.sa

Received: September 9, 2019   Accepted: October 7, 2019   Online Published: November 12, 2019
doi:10.5539/ijel.v9n6p382       URL: https://doi.org/10.5539/ijel.v9n6p382

Abstract
Numerous sociolinguistic studies have been concerned with investigating the factors that pose challenges to the position of Arabic in the Arab Gulf countries including the demographic structure, migrant labor, bilingual education, and the unique diaglossic nature of Arabic. However, thus far, there has been no conceptual framework for addressing the implications of the increasing use of English for the position and future of Arabic in these countries. A number of studies concluded that English has superseded Gulf Arabic and dominated the linguistic identity of its native speakers without providing empirical evidence for such claims. In the face of this limitation, this study adopts a sociolinguistic framework using language planning and language policy (LPP) methods in order to investigate the effects and implications of the use of English as a global language and lingua franca in the Arab Gulf states and propose workable, reliable and effective language policies that can help in maintaining Arabic as the first language in the Gulf Cooperation Council (GCC) states and addressing problems of language endangerment and death. Results indicate that the disappearance of a language and the loss of its status cannot be solely attributed to the widespread of global English. Global English, on the contrary, should not be considered as a threat to the linguistic and national identity in the GCC countries. The real threat that Arabic faces is the failure to meet the increasing needs of its users and speakers which has its implications for the status and future of Arabic. It is suggested then that more descriptive approaches should be adopted in the analysis and teaching of Arabic. Linguistic changes of Arabic should be considered inevitable and not be resisted in order for Arabic to address the changing needs of its users. Arabic should also be more involved in today’s globalised world. Finally, the sense of linguistic identity should be promoted among citizens and students.

Keywords: global English, language endangerment and death, language planning, language policy, linguistic identity

1. Introduction
With the increasing use of English as a global language and its dominance as a lingua franca all over the entire world, it has become increasingly difficult to ignore its implications for the rapid endangerment and death of many languages across the world (Bradley & Bradley, 2013; Grenoble & Whaley, 1998; Tsunoda, 2013). It is estimated that only 600 out of 6,000 or so languages in the world are safe from the threat of extinction (Crystal, 2000; Krauss, 1992; Sasse, 1992). In the Arab Gulf countries, it is argued that Arabic can lose its status as a first language in countries such as the Kingdom of Bahrain, United Arab Emirates, Oman, Qatar and even the Kingdom of Saudi Arabia. It is observed that the use of Arabic in many contexts such as trade, business and industry and even for communication is becoming very low. This can lead to the idea that one day Arabic cannot be the first language in these or some of these countries. Even worse, Arabic itself may be an endangered language in these countries and may even die. This study addresses the issue of how to maintain Arabic as the first language in the Arab Gulf countries using the sociolinguistic frameworks of language planning and policy. It investigates the problems and challenges for Arabic in these countries. It introduces the experiences of other countries which adopted language planning policies that helped in language maintenance in these countries. Finally, it proposes strategies and policies for Arabic maintenance in Arab Gulf countries.
In spite of the extensive sociolinguistic studies on the challenges of Arabic in the Arab Gulf countries and the factors that influence its status and position including labour migration, the widespread of Gulf pidgin Arabic, and bilingual education, so far there has been no conceptual or theoretical framework for investigating the implications of global English for the status of Arabic and the linguistic policies that need to be implemented to address the phenomenon of the increasing use of English in these countries. In other words, sociolinguistic studies have been largely concerned with investigating the impacts of demographic structure and foreign labour on the use of Arabic and its status as a first language in these countries while paying no attention to adducing empirical evidence of the influence of global English on Arabic. Research on the influence of global English has been traditionally concerned with listing the threats and challenges English poses on national and linguistic identity. English is blamed for the disappearance of Muslim and ethnic values based on no objective grounds. This study, in turn, adopts a sociolinguistic framework based on language planning and language policy (LPP) approach for investigating the implications of the use of global English for the status and future of Arabic in the Arab Gulf countries. In the light of this argument, this study addresses the following research questions. First, what are the consequences of using English as a global language for the position and future of Arabic in the Arab Gulf countries? Second, does global English pose real threats and challenges to the position of Arabic? Finally, given the inevitability of globalization and the increasing social, economic, and political changes that are taking place all over the world and the Arab Gulf states, what are the language policies that need to be implemented in order to avoid any negative impacts on the present and future of Arabic in the Arab Gulf countries?

2. Literature Review

Different studies have been concerned with investigating the factors of language endangerment and death as well as the ways and strategies of language maintenance and revitalization. It is argued that factors of language death are typically non-linguistic. These are commonly social, economic, and political factors (Campbell, 2000; Janse, Tol, & Hendriks, 2003; Roesch, 2012). These include among many others lack of economic opportunities, rapid economic transformations, on-going industrialization, work patterns, migrant labour, resettlement, migration, official language policies, discrimination, stigmatization, repression, colonisation, genocides, and wars (Broderick, 2011; Harrison, 2008; Janse et al., 2003; McMahon, 1994; Romaine, 2010).

With the emergence of globalization and the increasing interaction of small communities with the wider world due to the unprecedented development in communication and transport, English has been increasingly used all over the world at the expense of less influential languages (Grenoble & Whaley, 2006; Mohanty, 2018; Quevedo, 2018). As a result, language death and endangerment of different indigenous languages are often attributed to the rise of English as a global language. In other words, English is held responsible for the death of many languages world-wide today (Nettle & Romaine, 2000; Quevedo, 2018).

English has come to achieve this global status through different stages where it used to have tremendous effects on societies and countries (Crystal, 2003; Horobin, 2016). It started with the British colonialism in the seventeenth and eighteenth centuries which implemented English into many foreign countries all over the world. Peoples of colonized countries and occupied territories had to use English at the expense of their indigenous languages as they realized that it was very powerful and useful to them. Arguably, British colonialism laid the foundation for the status of English today (Boampong & Penova, 2010; Pennycook, 2002). With the Industrial Revolution and the British leadership due to the inventions and new communication technologies in the nineteenth century, English came to be more widely used worldwide where many countries had to use English which was considered as a language of knowledge (Barker & Mitchell, 2016; Crystal, 2003; Nevalainen & Traugott, 2016). At the end of the nineteenth century, the United States emerged as a political and economic superpower which had its impact on enhancing the importance of English as an international language (Northrup, 2013). By the end of the twentieth century, English has come to be internationally used in an unprecedented manner due to the emergence of globalization and the dominance of the American technology and culture accompanied by the permeability of national borders (Collins, Baynham, & Slembruck, 2011; Fairclough, 2007; Lee, Bacchus, & Alon, 2006). English has become the language of technology, science, trade, diplomacy, and the internet. Over the last 30 years, English has dominated the web (Chew, 2013; Richter, 2008). Even today, English is still at the top of the languages used on the internet according to the Internet World Stats in 2019. It is estimated that it’s estimated that more than 50% of all web content is in English. This final stage marks the global status of English.

In this context, numerous studies have indicated that the rise of English as a global language leads to the disappearance of many indigenous and minority languages. Some even argue that English is a killer language or
a vampire language (Ajepe & Ademowo, 2016; Blommaert, 2008; Ceramella, 2012; Eckert et al., 2014; Mair, 2003; Mauranen, 2005). In many parts of the world, the need of small communities to interact with the wider world and the lack of written standard from result in the use of English and the negligence of native language or what is referred to as language suicide (Hindley, 2012; Holmes, 2008). On the other hand, the argument that English is a killer language has been widely rejected by different commentators and scholars who argue that cannot be said to be a killer language. House (2003) asserts that the role of English as a lingua franca is not a threat to ethnic languages and multilingualism.

Whether English is a killer language or not, there is evidence that the widespread of English and the rise of English as a global language impact on the death and endangerment of many languages around the world. Crystal (2007) suggests that one average; there is one language around the world dies every two weeks. He adds that by 2100, more than half of world languages may disappear which will have negative impacts on the world’s history, culture, and heritage. Despite the devastating effects of language death crisis, far too little attention has been paid to language maintenance efforts: the issue of language maintenance is not at or even near the top of the linguistic agenda. This entails that every day we are losing more and more of human languages. So why are language maintenance efforts imperative?

In spite of the increasing effects of globalization and the use of many languages including Arabic all over the world, very little has been done in relation to the implications of the use of English as a global language for the status of Arabic as the first language in different Arab Gulf states. This study addresses this gap in the literature by focusing on the challenges and threats English as a global language may pose on Arabic and proposing some reliable strategies that can address the problem and maintain the status of Arabic in these countries.

3. Methodology

This study is based on a case-study design. It is concerned with investigating the effects and implications of the use of English as a global language and lingua franca on the language endangerment and loss of linguistic identity in Arab Gulf states. Procedures can be summarized as follows. First, it lists the challenges of Arabic in the Arab Gulf states and the implications for the use of English as a global language for the status of Arabic and linguistic identity through investigating the social, economic, and political factors that influence language use. Second, it proposes strategies for language maintenance in the Arab Gulf states. In order to do this, the study adopts a language planning and policy (LPP) approach for investigating the social, economic, and political factors that influence the status of Arabic in the Arab Gulf countries. It also explores the roles played by pressure groups as well as social and political movements on policy makers.

Language planning is a branch of sociolinguistics which is concerned with the study of regulating policies and linguistic methods that can preserve language from being lost or dead (Fishman, 2011; Ricento, 2006). Linguistic planning means studying and investigating the problems and challenges which face language, whether purely linguistic problems, such as the generation and updating of vocabulary and building terminology and standardization, or nonlinguistic problems of prejudice and use of language (Crystal, 2012). The concept of language planning is always associated with language policy (Jahr, 2011). Language policies refer to the official measures adopted by governments in order to protect a language from disappearance and death or discourage the use of a particular language. Fettes (1997, p. 14) indicates that there is a close relationship between language planning and policy. He explains that the two concepts are closely related to each other despite being different. He argues that “language planning must be linked to the critical evaluation of language policy: the former providing standards of rationality and effectiveness, the latter testing these ideas against actual practice in order to promote the development of better language planning models. Such a field would be better described as language policy and planning LPP”.

In this context, LPP is defined as planning—often large scale and national, usually undertaken by governments—meant to influence, if not change, ways of speaking or literacy practices within a society (Baldauf, 2004).

LPP was developed in the second half of the twentieth century for addressing the language problems in new, developing and/or post-colonial nations. The development of LLP as a discipline in applied linguistics underwent three historical stages. At the first stage (usually referred to as the 1950s–1960s period), LPP research was oriented towards problem solving (Hult & Johnson, 2015). During this period, linguists and researchers were mainly concerned with developing the writing systems, grammar, and dictionaries of the indigenous languages that were lost due to Western colonialism. The hallmark of this phase is ‘decolonization’ as the work focused on solving language problems brought by the colonial powers. Interestingly, theoretical frameworks during this period did not take into account the socio-political of language planning processes. There are successful examples of the use of language planning and language policy in maintaining ethnic and indigenous
language in different parts in Africa, Asia, the Pacific, and different parts of the world where native languages were greatly influenced by other languages including English and French. Thanks to measures of language planning and policy, the indigenous languages of many speech communities were survived (Ager, 2001; Baldauf & Kaplan, 2007; Chen & Gottlieb, 2013; Kaplan & Baldauf, 2008; Kirkpatrick & Liddicoat, 2019; Liddicoat & Baldauf, 2008). In these experiences, effective language planning measures were developed for the purpose of preserving indigenous languages or changing the linguistic status in these areas. In spite of the diverse circumstances and contexts, language planning measures were usually based on educational, cultural, and religious approaches for increasing language awareness and maintaining the language itself.

The 1970s–1980s period marks the second stage of the LPP research. During this period, researchers were concerned with addressing immediate language problems of the post-colonial countries in different parts of the world including Africa, Asia, and the Middle East. The hallmark of this stage is ‘structuralism’. Although LPP research at this period was non-political and non-ideological, sociocultural contexts were considered in the LPP studies. During the third stage starting from the 1990s to the present, however, methodological frameworks focus on the social, political, and broader contexts in LPP research. It is thus referred to as the ‘pragmatism period’. It has become clear that language issues are closely associated with social, political, and other broader contexts such as the new world order, globalization, wars, conflicts and immigration.

The LPP research is now more concerned with social and political issues such as promoting one official language at the expense of others, or even establishing the rights of minority groups to use their own languages. Politically, many countries in different parts around the world including Africa, Asia, and Latin America have designed different policies in order to address these issues including linguistic assimilation, linguistic pluralism, vernacularization, and internationalism (Baldauf & Kaplan, 2004, 2007; Chen & Gottlieb, 2013; Coronel Molina & McCarty, 2016; Kirkpatrick & Liddicoat, 2019; Orman, 2008; Webb, 2002; Zsiga, Boyer, & Kramer, 2015).

Given the social and political contexts of language issues and their implications for the LPP research, this study adopts a critical sociolinguistic perspective of LPP in order to present an analysis of language policy and practice in the GCC countries and examine how social and political changes, which have emerged with the oil discoveries in the region, have introduced a new power relation Arabic and English in these countries, as seen in the new language practices.

4. Analysis and Discussions

English was first introduced to the Arab Gulf region with the British colonial period at the beginning of the nineteenth century. During this period, England extended its power over many parts of the world including the Arab Gulf area which resulted in a direct contact with English speakers (Weber, 2011). With the discovery of petrol in the Arab Gulf region in the first half of the twentieth century, English has come to be widely used all over the Gulf countries. This period witnessed what Karmani (2005) called petro-linguistics. During this period, the Anglo-American companies controlled the petroleum industry in the region and this gave rise to the use of English as an official language. The Oil Concession Agreement signed in 1933 between Saudi Arabia and Standard Oil Company of California, for instance, was issued in English then it was translated into Arabic (Frade, 2007; Weber, 2011). The widespread of English in the Arab Gulf region during this period was parallel to the development English as the language for science and technology. It also proved itself as an international language across all the world institutions. Today, English is increasingly used in the Arab Gulf region in an unprecedented manner due to the increasing importance of English as a global language and the unprecedented development of communication channels. Many students, graduates and professionals have realized the importance of speaking English due to the economic benefits it brings about. In many cases, there are some sort of pressures on people to speak English in order to be hired by many firms which require the proficiency in English for hiring candidates. Many of them also have to use English in the workplace since many firms and companies across the Gulf Cooperation Council (GCC) states have come to adopt English as the official language. Due to the increasing importance of English at the expense of Arabic, two-thirds of the people think that English should be the official language in the GCC states according to a poll conducted by Arabian Business in March 2008 (Bowman, 2008).

The use of English has always been the focus of “many debates about religion, politics, and culture and the language has frequently been blamed directly for the erosion of Islamic values” (Weber, 2011, p. 60). Many Arab linguists, scholars and religious leaders have been always trying to impose a quasi-monolingual policy in favour of Arabic for what they call identity formation and national cohesion on the basis of nationalistic and religious arguments. It should be noted here that Arabic is highly celebrated in the Arab and Muslim countries as it is the language of the Holy Quran which is believed by Muslims to be the words of God (Allah). Arabic,
therefore, represents a sort of cultural significance for many Arab speakers. It is also a critical component of the linguistic and cultural identity of those speakers (Buckingham, 2016).

In this regard, many Arab linguists, scholars, as well as religious and political leaders manipulate nationalist and Islamist discourses in order to advocate the idea that the Western ideological influence as represented in the use of English in the Arab Gulf countries is a threat to the national unity and Muslim heritage. For them, the use of English will lead definitely to the loss of the Muslim precious cultural heritage. Bassiouni (1988) argues that the loss of Arabic in many parts of Africa, Asia, and even Europe led to the disappearance of the Muslim values in many of these countries. For many years, Arabic has been used as an international or what Crystal (2012) describes as a global language. It was spoken in different corners of the world due to trade and spread of Islam throughout Africa, Asia and even Europe. Due to the Arab and Muslim conquests of many parts of the world during the seventh century, many of the indigenous languages of these countries disappeared and Arabic was used as the first and official language (Versteegh, 2015). In the same way, different political thinkers and leaders who support the Pan-Arabism ideology and movements have long resisted the dominance of English claiming that it is a threat to the national identity. For them, the use of English in Arab countries is a continuation of Western colonialism and imperialism of the Arab world. It is worth noting that they have been opposing any multicultural trend or the rights of minorities to have their ethnic or indigenous languages (Miller, 2003). In spite of the increasing fears of the widespread and dominance of English in the Arab Gulf countries, we argue that global English cannot be investigated apart from the other social, economic, and political changes that are taking place in the region. Global English by itself cannot be a threat to the national and linguistic identity in these countries.

The issue of the use of English cannot be separated from the social, economic, and political changes that have been taking place over the last 50 years in the region. These changes can be clearly seen in the demographic changes in the GCC states due to the international labour migration. According to the World Bank reports, the GCC countries have the highest percentage of international labour in the world. In 2010, the number of expatriates represented more than half of the GCC total population. Now, expatriates represent around half of the total population. Qatar has the highest expatriate rate in the region while Saudi Arabia is the lowest.

Table 1. Population by nationality in the GCC states, 2016

<table>
<thead>
<tr>
<th>State</th>
<th>Total Population</th>
<th>Nationals</th>
<th>Expatriate Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qatar</td>
<td>2,617,634</td>
<td>340,293</td>
<td>2,277,341</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>9,121,167</td>
<td>2,736,351</td>
<td>6,384,816</td>
</tr>
<tr>
<td>Kuwait</td>
<td>4,082,704</td>
<td>1,222,837</td>
<td>2,812,503</td>
</tr>
<tr>
<td>Bahrain</td>
<td>1,423,726</td>
<td>647,835</td>
<td>759,019</td>
</tr>
<tr>
<td>Oman</td>
<td>4,414,051</td>
<td>2,344,946</td>
<td>1,069,226</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>31,787,580</td>
<td>19,863,975</td>
<td>11,705,998</td>
</tr>
<tr>
<td></td>
<td>53,446,862</td>
<td>26,815,944</td>
<td>26,630,918</td>
</tr>
</tbody>
</table>

Source: The Statistical Centre for the Cooperation Council for the Arab Countries of the Gulf.

When it comes to the numbers of employed populations, expatriates represent more than 80% of the employed populations in the GCC countries.

Figure 1. Percentage of nationals and non-nationals in GCC States’ employed populations, 2015

Expatriates come from different countries including India, Pakistan, Bangladesh, Great Britain, USA, Philippines, Afghanistan, and Turkey. They speak different languages and it is important for them to communicate. Although Gulf pidgin Arabic is widely used for communication, it is still limited to just one category of expatriates. In this context, English emerged as a lingual franca to make communication possible between those expatriates who come from different linguistic backgrounds. In this regard, English can be accepted as a lingua franca which should not be seen in conflict with Arabic. This study goes with the argument that the disappearance of a language and the loss of its status cannot be solely attributed to the number of populations speaking a language. Crystal (2000, p. 11) asserts that an absolute population total makes no sense. He argues that “the analysis of individual cultural situations has shown that population figures without context are useless. In some circumstances, such as an isolated rural setting, 500 speakers could permit a reasonably optimistic prediction; in others, such as a minority community scattered about the fringes of a rapidly growing city, the chances of 500 people keeping their ethnic language alive are minimal.”

It can be argued that members of a group can keep their linguistic and cultural belonging in spite of rapid and growing social and cultural changes. There are so many examples of minorities who have successfully preserved their own language and culture. If speakers are aware of the importance of language as a symbol of cultural survival and continuity, they become more concerned with preserving and maintaining it in order to protect their linguistic and cultural integrity. It is also argued that multilingualism is not a threat to national unity (Adegbija, 2004; Blackledge, Creese, & Milani, 2010; Cuvelier, 2007; Miller, 2003; Pattanayak & Illich, 1981; Spolsky, 2004; Zsiga et al., 2015). This means that there is no problem with the use of English by the GCC citizens. Speaking more than one language enhances human understanding and helps societies and communities have more liberal and globally-literate citizens.

The real challenges Arabic faces, however, are the flexibility to meet the increasing needs of its users or speakers in a world that is changing in an unprecedented manner. These may have negative impacts on the language use and even linguistic identity of its speakers. If a language is not changing to address the needs of its users, it will eventually die (Crystal, 2003; Langston & Peti-Stantic, 2014). In this regard, language changes should not be resisted. Language change should be seen as inevitable for modern world (Aitchison, 2001; Cushing, Clayton, & Giovanelli, 2018; Davis & Iverson, 1992; Tamasi & Antieau, 2014). As thus, more descriptive approaches should be used in the use, analysis and teaching of Arabic. Arabic should be flexible enough to accommodate linguistic changes and address the needs of its users and speakers (Baker, 2015; Crystal, 2000; Galloway & Rose, 2015; Rose & Galloway, 2019).

It is also suggested that the sense of linguistic identity should be promoted among students and individuals. In fact, different policies and measures have been devised for this purpose. In 2008, for instance, UAE confirmed Arabic as the official language to be spoken in all government and federal departments and offices to keep and maintain the cultural values. Similarly, the Saudi Vision 2030 highlights the importance of Arabic as a requirement for maintaining the national values and principles.

We will endeavor to strengthen, preserve and highlight our national identity so that it can guide the lives of future generations. We will do so by keeping true to our national values and principles, as well as by encouraging social development and upholding the Arabic language (The Saudi Vision, 2030, p. 17). Nevertheless, more policies are required for the promotion of linguistic identity. Citizens and students should be encouraged to be more enthusiastic about their mother tongue. Parents also should realise that preserving the mother tongue helps in integrating children into their community and connecting them to their collective pasts, which is important for the development of an integrated identity (Evans, 2014; Orman, 2008; Stevenson, 2010). Arabic should not be considered a low-status language. Even in international schools and universities, English should not be the only language acceptable for practice. All students with different linguistic backgrounds have the right to communicate in their ethnic languages. Schools which forcibly impose English as the only language that is acceptable should realize that they are committing linguistic genocide. In contrast, schools should incorporate language awareness activities into learning materials in order to improve the students’ development of linguistic identity. Besides, schools and educational institutions should develop high personal self-esteem that results in a positive attitude towards students’ language and heritage. In work settings, too, multilingualism should be encouraged so that employees and workers enjoy the shared personal and intimate interactions brought about by language and identity. Arabic should be accepted as a working language. It is suggested then that GCC governments should define clear policies maintaining that students and workers should not be forced in any way to shift to another language. Nongovernmental organizations should also contribute to the promotion of linguistic identity and increase awareness about the Arab heritage and values in the GCC countries. Finally, Arabic should be more involved in today’s globalized world. This can be done through increasing the contribution of Arabs to
the world’s science and technology and maximizing the role of social media platforms in highlighting the importance of Arabic as the language of culture and heritage. Social media platforms should be used as a channel to connect the younger generations to their pasts. In this regard, social media platforms should not underestimate the importance of Arabic as a reliable means of communication.

5. Conclusion
In spite of the fears in the GCC countries about the loss of national identity caused by the use of English, this study concludes that global English by itself does not represent a threat to the present and/or future of Arabic in these countries. It is also claimed that linguistic diversity should not be considered a problem in the GCC states. Rather, it should be seen as an asset. Given the increasingly rapid social, economic, and political changes that are taking place within the region, however, there is a real threat of resisting language changes and the inability of Arabic to address the increasing needs of its users which may have negative impacts on linguistic identity. In this regard, Arab linguists should adopt more descriptive approaches towards the use, analysis, and teaching of Arabic. Linguistic changes should be considered as inevitable and lexical borrowing should be used as a working and reliable mechanism for addressing the increasing needs of the Arab speakers in this ever-changing world. Arabic should also be more involved in today’s globalised world. Our indifference and/or refusal to get involved in this globalized world is a refusal to preserve our language and heritage. Finally, the sense of linguistic identity should be promoted among citizens and students.

Acknowledgments
This project was supported by the Deanship of Scientific Research at Prince Sattam Bin Abdulaziz University under the research project No. 10846/2/2019.

References


Theoretical Explorations with Special Reference to East Africa. Berlin: Mouton.


Copyrights

Copyright for this article is retained by the author, with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).