Design Principles for bi-scriptual Arabic-Latin Typography

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Abstract

This research shows the role of design quality on which bilingual and bi-scriptual layout depends. Negative and positive effects of typographic design are more than aesthetic; they concern cultural identity. If a design implicitly disrespects the text of one culture, or if the written elements of a language are treated with less regard than the juxtaposed language, readers of that language feel marginalised and less valued.

Bilingual and bi-scriptual typography have not been treated as a new field of typography, and there remains a lack of analysis of the different typographic and design needs of bilingualism and the specificity of bi-scriptual texts. There is much literature shedding light on the practice of type design to marry two scripts, but research into the principles of how to treat two languages or scripts for the arrangement of text in a layout remains scarce.

This research project includes both primary and secondary research on bilingual, bi-scriptual layouts that juxtapose Latin and Arabic. In general, most demonstrate poor quality design, as there is a lack of guidance and training for designers on how to treat Arabic in coexistence with Latin. Arguably, this poor design quality has a negative effect on the cultural identity of the readers of the language, and, as relevant literature shows, it appears that people are becoming accustomed to such poor design qualities. A principle is therefore needed to guide the practice of bilingual, bi-scriptual layouts.

This research considers bilingual, bi-scriptual typography as a new field of typography, intending to identify its needs with a specific focus on typographic issues that are distinguished from monolingualism. The aim is to set a principle and identify the role of principles that feed bi-scriptual Latin and Arabic typographic practices.

As a result, the conclusion of this research proposes a new set of categorisations for the field of bilingual, bi-scriptual typography. It further proposes a new categorisation of typographic layouts in the juxtaposition of Latin and Arabic; and it provides a detailed critical analysis of the anatomy of letterforms. Finally, principles are proposed to include their role of achieving visual excellence in the juxtaposition of Latin and Arabic.

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Clarification of Terminologies

Bi-scriptual typography: “Bi-scriptual” refers to bilingual layouts in which coexisting languages are written in two distinct sets of scripts. For a detailed clarification, please refer to Chapter 4, section 4.2.1.

Chapter 1: Introduction

Globalisation, multiculturalism and social and political movements between countries make bilingual communication inevitable in developed societies worldwide (Li and Moyer, 2008; Balius, 2013; Wittner et al., 2020). Research into bilingualism in the fields of graphic design and typography (Wittner et al., 2020). shows written communication as the most important medium of message delivery, empowered by bilingual typography as a necessary communication tool for everyday life in this multicultural era. The growth of the global marketplace and international communications require graphic designers to work with multi-scripts in a single printed item (Sadek and Zhukov, 1997; Boutros, 2009; Leonidas, 2015; Gassas, 2016). This involves designers more than ever with bilingual projects using different languages in designs for posters, websites and logos.

Examples of bilingual typography, such as the juxtaposition of English and Arabic languages, is evident internationally and observed throughout this research as a pervasive phenomenon in London, Turkey, the Gulf States, Dubai, Lebanon, Jordan, etc.

Bilingual typography concerns not only new typographic and design issues; but also as an 'activity at the service of culture and society' (Balius, 2013a:29)[1], and the interface of typography with bilingualism in typographic layouts links bilingual typography with societies' socio-cultural aspects[2]. For instance, the presence of such layouts in different layers of multicultural cityscapes influence citizens' sense of identity (AbiFarès, 2010), diminishes discriminable cultural and social gaps, and causes interpersonal conflict (Wittner et al., 2020).

Bilingual typography is nowadays a trending discussion and practice in the fields of graphic design and typograph, leading bilingual typography towards a 'new field' of typography[6] which requires designers with new skills and knowledge.

The problem is that, as primary and secondary research within the course of this study shows, the bi-scriptual Latin and Arabic typographic layouts in the different layers of

[1] Balius (2013a:29), in their analysis of typeface designers' role in society commented, 'multilingual typography is an activity at the service of culture and society'.

[2] For more details refer to section 1.1.2.

[6] Reflecting on the necessity of different skills and knowledge required as the growth of bilingualism and its consistent effect on variable fields of studies increases, the linguist Charlotte Kemp (2007), comments: "'bilingualism' and any fields affected by this phenomenon should be recognised as a 'new field'."

cityscapes and publications neglect the importance of design quality[7] and the role that plays in socio-cultural aspects of society. The simultaneous bi-script layouts in these contexts evidence poor and inappropriate design quality[8]. There is therefore a need to improve the design quality of bi-scriptual Latin and Arabic scripts[9].

The researchers of bilingual layouts in responding to the needs of societies for bilingual typographic communication have, in the majority of cases, proposed a new bi-scriptual typeface and provided guidance on the practice of bi-script typeface design (Grant, 2006; Nemeth, 2006; AbiFarès, 2010; Maag, 2012; Balius, 2013; Chahine, 2013; Paek, 2014; Zoghbi, 2015; Afshar, 2017; Dhawi, 2017; Wittner et al., 2020). Those who have discussed new approaches for arrangement of texts (Sadek and Zhukov, 1997; Baki, 2013; Baur et al., 2020; Wittner et al., 2020). have focussed either on general guidance , without analysis of context[10], such as typographic challenges common in bilingual approaches for different coupled scripts, such as different reading and writing directions, different typographic habits, and different visual anatomy of the juxtaposed scripts; or they proposed bi-scriptual typographic approaches that are very specific to a project without the potential for extension to other contexts[12]. Therefore, to improve the design quality of bilingual typographic layouts, some established guidance and principles exist but they have not been gathered together. Some of this existing guidance needs extension, and there is some that has not been discussed in bilingual research and has to be drawn from other typographic fields, such as linguistic and monolingual. There is a lack of training for designers in working with the Arabic script in coexistence with Latin and there is a need for designers to

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[7] The definition of quality is available at Appendix 1, Section AP1.14.

[8] For more information please refer to Chapters 2 and 3.

[9] Language as a general view is a medium of communication, which is demonstrated in both spoken and written form; however, the script refers to the complete character set, which uses a written format of a language. For example, English and German languages both use Latin script in their writing systems, although they cannot understand one another's language. Therefore, the juxtaposition of Latin and Arabic scripts is not only limited to English and Arabic languages, but it encompasses multiple sets of two languages, which use Latin script (almost 119 languages), and Arabic script (nearly 19 languages) in their writing systems.

[10] Analysis of context refers to analysing the different functions of typographic layouts, with the aim of grouping them based on their similar typographic and audiences' needs. For more detail refer to Section 1.6: research Methodology and Chapter 4, Section 4.1.2.

Context refers to specific typographic layouts that distinguish themselves from other layouts due to their different functions. For critical analysis and understand different type contexts proposed at this research refer to section 4.3.

[12] As the results of the literature review on typography definition and analysis of involved practices affirm (Twyman, 1979; Walker, 2001; Jury, 2006; Kenna, 2012; Turgut 2017), typography practices involve Arrangement of written elements as a bridge between the message and meaning of the written elements with reader', 'Practice of Type Design and Production', and 'Expressive typography'. This research is mostly focused on providing guidance for the first point; however it assumed the existing guidance may benefit the practice of bi-script typeface designs as well. A full analysis of the 'typographic practices', and remits of this research is available in Appendix 1, Section AP1.1.

acknowledge the role of principles in guiding bi-scriptual layouts, so they could tackle challenges by independently making appropriate design decisions, relevant to function and context. As the literature review compiled during the course of this research shows, achieving appropriate quality in bilingual layouts depends not just on typefaces and their readability, but also on the functionality of the context, the readers' expectations and needs, and the cultural aspects linked to the context of the typographic layout. A set of principles is required that defines the effect of type elements within a context, and even the practice of typeface design for a communicative purpose must harmonize with the context and the requirements and principles of the layout.

Although monolingual typography has been defined as a field, and benefits from clarified guidance, design and typographic principles, bilingual typography has never been considered as a field of typography. This lack means its needs and ruling principles specific to contexts' function have yet to be defined, categorised and identified.

For the first time therefore, this research considers bilingual typography as a new field. Through primary and secondary research, this work provides clarification on definition and proposes categorisation according to different design needs. In addition, it provides analysis of context for a specific category of simultaneous bi-scriptual layouts in static environments in the juxtaposition of Latin and Arabic scripts. Finally, as an outcome, it proposes principles as guidance for the practice of bi-scriptual Latin-Arabic typographic layouts and improve its design quality. It may also be valuable for guiding the juxtaposition of other sets of scripts and for other categories.

1.1. The necessity for research and its importance

1.1.1. The ubiquity of Latin script leads design decisions

Research on *the secret history of writing* (Sington, 2020), *eurocentrism* (Plys, 2013)[13] and *typography and graphic design with multiple script systems* (Wittner et al., 2020)

[13] Plys (2013)'s *Eurocentrism*, refers to societies', especially 'the East's, interest in simulating Western world rules.

demonstrates that Latin script is a ubiquitous element in bi-scriptual typographic layouts worldwide. The analysis of research and practices (Nemeth, 2006; AbiFarés, 2010; Chahine, 2012; Baki, 2013; Paek, 2014; Captan and Sarkis, 2020; Takagi, 2020; Tam, 2020; and Lavi-Turkenich & Stern, 2020) has focused on bi-scriptual typographic approaches clearly demonstrated the ubiquity of Latin. Studies conducted in various societies with different official writing systems, including in Dubai (Arabic script), Lebanon (Arabic), Russia (Cyrillic), India (Devanagari), Korea (Hangul), China (Henzi) and Japan (Kanji), found that bilingual typographic practices predominantly pair a society's official or local script with the Latin script.

Reasons for the ubiquity of Latin script in 'non-Latin script'[14] (Ross and Shaw 2012) societies, and its influence on typographic approaches have been scrutinised by David Sington (2020), as presented in *the Secret History of Writing:* a documentary on the BBC LIVE channel; and by the graphic designer and typographer, Huda Smithuijzen AbiFarés (2001). Both studies assert that 'Latin letterforms' – the Roman Empire's script[15] – due to its simplified anatomy adapted faster to print technology, therefore using Latin was easier in the early printing age compared with other scripts, especially Arabic[16]. In addition, studies (AbiFarés, 2001; Balius 2013) show that the development of typographic materials for Latin script, in both quality and quantity, occurs 300 years earlier than Arabic due to cultural, political and economic conflicts[17]. These two issues: the early adaptation of Latin script to printing technology due to its simplified anatomy of letterforms, and Latin's earlier development of typographic materials in both quality and quantity, lead to rapid publication of information in Latin script in the early days of printing, at the same time delaying publication in Arabic script. Sheila S. Blair (2008), in her work *Islamic Calligraphy*, explores

[14] Researchers and typographers (Ross and Shaw 2012) commented on the use of 'non-Latin script' to distinguish all other scripts from Latin, implies superiority of Latin script and encourages Latinisation of 'non-Latin' scripts in typographic approaches. Balius (2013) in his PhD thesis argues that a better term must be used to refer to non-Latin scripts and commented on commented on the de-colonialisation of the superiority of Latin-based scripts. However, due to the lack of an appropriate term, he decided to use 'Non-Latin Script'. In this research, I decided to use non-Latin script since my research shows the ubiquity of Latin script in bilingual layouts, which means juxtaposition of non-Latin scripts in bilingual layouts is very minimal compared with juxtaposition of Latin with non-Latin scripts. Therefore, using this term 'non-Latin script' perfectly helps mutual understanding of this research context. However, it is not intended to imply superiority of Latin script in bilingual texts, nor does it approve of the Latinisation approach.

[15] Some researchers, such as Paek (2014), refer to Latin script as Roman script..

[16] The story of printing starts in Europe in the 13th century, while the first Arab alphabets appear in printing in 1505 (AbiFarès, 2001).

[17] According to AbiFarès (2001:43): "The reasons behind this delay were due to the cultural, political and economic conflicts within the Ottoman Empire at the turn of the 18th century."

Arabic script's link with religion and commented that that was the reason for the delay of the adoption of Arabic script for print. According to Blair (2008:29): "The sacredness of the scripture led to its transcription manually in a beautiful hand, and this sanctity explains why handwritten copies remain popular and why printed editions of the Koran were so slow to be accepted." Balius (2013a:74) similarly commented that "the poor aesthetics of printed books could not compete with the exuberant beauty of the manuscripts made by skilled Arabic calligraphers." Therefore, the early publications in Arabic script were not accepted by Arabic script readers. Milo (2002) commented that the delay was due to the poor quality of Arabic typeface designs produced in Europe. Safadi (1978) argued that it is because Arab culture was rich in oral literature before Islam, and there existed a mistrust of the written word. And finally, Ross and Shaw (2012:17), in their analysis of printing progress in South Asia, commented that "printing in South Asia was rejected due to [its being] irrelevant to the material realities of the literary culture."[18]

According to Sington (2020), the spread of information in Latin script in the early 20th century empowered and enriched Europe. This caused the West to become a symbol of 'advanced' and 'cultured' society and encouraged many leaders to imitate Western/European values to develop their countries. The Latin script was taken as a symbol of the West, a symbol of 'modernity' and 'the single script of the universe'. Therefore leaders of other countries, as part of simulating Western values with the aim of developing their societies and the spread of information started to use Latin script (Sington, 2020).[19] This also influenced the field of bilingual typography.

Firstly, Latin script become an inseparable element of bi-scriptual typographic layouts worldwide[20]. An example of the necessity of Latin script's presence in multicultural societies' typographic layouts is demonstrated by the fact that in Israel, where, due to the cultural conflict, the presentation of information simultaneously in Hebrew and Arabic

[18] Full details of the first printing of Arabic texts are available in Balius (2013:74). A chronological approach to bi-scriptual Arabic and Latin publications conducted during the course of this research is available in Appendix 6.

[19] For example, in 1980, by Ataturk's order, Turkey's writing system changed from Arabic to Latin because, as Haralambous (1998) explains, this change of writing systems brought Turkey closer to Western countries.

[20] Current projects and academic research on bilingual typographic layout in Arabic societies focus on the juxtaposition of Arabic and Latin (AbiFarès 2001, Nemeth, 2006, Chahine, 2012, Baki, 2013; Wittner et al., 2020); in Russia, Cyrillic and Latin (Yukechev, 2020); in India, Devanagari and Latin (Wittner et al., 2020); in Greece, Greek and Latin (Leonidas, 2020); in Korea, Hangul and Latin (Wittner et al., 2020; Paek, 2014); in China, Henzi and Latin (Tam, 2020); and in Japan, the focus is on the juxtaposition of Kanji, Hiragana or Katakana with Latin (Takagi, 2020).
Gasses (2016) states that international corporations hugely affected the growth of bilingual logos in certain countries, such as Saudi Arabia. According to his observations, 71% of logos in Saudi Arabia were originally Latin.

scripts is vital, bi-scriptualism changed into multi-scriptualism by adding Latin script juxtaposed with Hebrew and Arabic. As typographers, Lavi-Turkenich and Stern (2020:247) observed that the road signs in Israel are mostly 'multilingual', involving the juxtaposition of Hebrew, Arabic and Latin.

Consequently, the juxtaposition of Latin and Arabic scripts in typographic layouts has become ubiquitous in both Arabic script societies and in Arabic local communities in foreign script societies. Baki (2013:38), in her analysis of bi-scriptual contexts in Beirut, observes that "with the rapid spread of globalisation, English and Arabic often enter the public realm together." Moreover, AbiFarés (2001:117, 2010:6), in her analysis of typographic layouts in Dubai, Lebanon and Egypt, observed that the juxtaposition of Latin and Arabic scripts in different layers of Arabian Gulf states[21] is a pervasive phenomenon.

Nowadays, it can be seen in route finding systems, public spaces, transport terminals (airports, train stations, road signs), advertising boards, posters, branding (restaurant menus and logos), packaging, books, publications, apps, websites, ID documents (identity cards, passports), banknotes, bank cards and translation training (Wittner et al., 2020:13)[22]. Secondly, the use of Latin script shapes local Arabic audiences' trust in the quality assurance of the product or message. Graphic designers and founders of the design studio Eps51, Wittner et al., (2020:8), have commented that ''in the Arab world, the usage of English for a long time was synonymous with high quality as opposed to advertising only in Arabic.'' Similarly, typographer Kapp (2011:20), in an analysis of bi-scriptual Arabic and Latin brands in Arabic countries, interviewed Arab students, who felt that including Latin script in the graphic design and typographic layouts such as logos, shop signs and menus, made audiences feel that the message presents a higher value and better quality services compared with presenting the same message monolingually in Arabic (Kapp, 2011)[23]. This testifies to bi-scriptual Latin and Arabic scripts becoming a ubiquitous phenomenon, not only in multicultural and metropolitan societies (due to the growth of multiculturalism and

[21] The Arabian Gulf States include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

[22] The need for bi-scriptual Latin and Arabic layout is growing, as the survey conducted by the European Commission in 2008 (cited in Balius, 2013:30) shows, "It is estimated that about thirteen million Muslims reside in the European Union. This corresponds to approximately 3.5% of the total population of the EU and by 2050, it is expected that 20% of Europe's population will be Muslim."

[23] Kapp (2011) discussed the main reason that Arab people customise their local culture to follow European culture is the intention to follow freedom of speech, freedom of sexual relationships and rationalism in Europe and the USA, which are restricted in their own Arab countries due to religious and social restrictions. Therefore, they are encouraged to pursue European culture in every aspect of life including design, shopping, and the use of European languages in speech.

globalisation), but also in Arabic-script local countries where audiences, as the result of political, economic and social influences, trust and engage better with bi-scriptual brands that have Latin scripts compared with monolingual Arabic script brands.[24]

Finally, and more importantly, adopting Latin script as a way of simulating Western values had a negative effect on typographers' decisions on typographic values. As primary and secondary research conducted during this research shows, Latinisation[25] has become a trend in bi-scriptual approaches. Most typographic approaches for Arabic script in bi-scriptual Arabic and Latin layouts have wrongly followed typographic solutions more suitable for Latin script. Said's research (1995:40) on Orientalism claims that, since the 19th century, an assumption has been made in the East that 'the Orient and everything in it was, if not patently inferior to, then in need of corrective study by, the West.' This compels designers of bi-scriptual typography to apply Latin typographic rules, sometimes blindly, without analysing the effect of the approach on the culture of Arabic script[26].

To sum up, although the presence of Latin script in bilingual approaches has a significant effect on audiences' engagement and identity, designers of bi-scriptual Arabic and Latin layouts must consider Arabic script typographic needs in finding typographic solutions appropriate for the Arabic script culture, rather than merely following solutions that work for Latin script.[27]

1.1.2. Bilingual typography links to socio-cultural aspects of societies

Multiculturalism and globalisation enforced a change in graphic designers' roles and responsibilities to respond to socio-cultural, ethical and political issues (Baur and Felsing, 2016). Research shows bilingual typographic approaches due to the marrying of different cultures played a significant role in responding to socio-cultural aspects of societies. This

[24] Another reason for trusting products with bilingual labels including Latin script is that the Latin script presents the product that has been imported from a European country where the quality assurance regarding health and safety issues have been conducted by authorised Western authorities, which are believed superior due to use of higher technology and stricter rules in the West compared with the East, the products meet better quality standards.

[25] According to Papazian (2005:35) Latinisation is defined as "design of non-Latin type by indiscriminately imposing the conventions of Latin typography on other scripts."

[26] For clarification on the 'culture' of a script, refer to Section 2.2.5.a.

[27] A full analysis of Latinisation, its pros and cons, is available in Section 6.5.1.

section demonstrates the effect that bilingualism in typographic approaches has on socio-cultural aspects of societies and analyses the effect[s] sustained as a result of bilingual typography.

These effects make this research more necessary, since achieving a high-quality bilingual design is no longer concerned only with design aspects and user engagement, but has a bigger role as it influences societies' culture and ethics.

1.1.2.a. Bi-scriptual typography reducing social gaps in societies and influencing interpersonal conflicts

Regarding the influence of bilingual typography on the socio-cultural aspects of a society, an Indian visual artist and designer, Ishan Khosla (2020:125), in an analysis of bilingual typographic approaches in India, claims that the presence of bi-scriptual layouts, including the coexistence of Latin and Devanagari in various parts of the country, helps to reduce the gap between different social classes. Khosla argues that in India knowledge of English is exclusive to educated people. Thus, readers of English are considered a higher social class than non-readers (Khosla, 2020). For instance, Indian companies' advertisements that target high social-class audiences and markets are either bilingual, including the local language and English, or in English only. However, products aimed at lower socio-economic markets advertise monolingually in the local dialect (Khosla, 2020)[28]. Therefore, as Khosla argues, by presenting the advertisements bilingually for both markets, all Indian citizens would be put on the same footing and treated at the same level. Social and class connotations vary in different countries and societies, and may consequently perpetuate the lasting effect of the British Empire. In addition, the global reach of Western brands and contemporary cultural output may have influenced these connotations across the world.

Finally, bi-scriptual typography may influence interpersonal conflicts in multicultural societies. As the founders of the graphic design studio Eps51, Wittner et al. (2020:8) observed, bi-scriptual typographic layouts in some societies with high cultural conflict, constitute a political statement. For instance, they observe that the coexistence of Hebrew and Arabic scripts in typographic layers of Israel's society, created by Israeli type designer Liron Lavi Turkenich, furthers 'intercultural exchange' and 'interpersonal understanding' in

[28] For more information refer to Khosla (2020:125), who points out that both bilingual and monolingual advertisements include static print versions and broadcasts published on the radio and on TV.

the context of the cultural conflict between Jews and Muslims in Israel.

Although bilingual typography may be used to help erase the perceived gaps between classes, typographers must be mindful of the potential for the layout of such works to imply a hierarchy, with one language dominant or presented as if more important than the other.[29]

The above discussions show that the phenomenon of bilingualism in typography may influence citizens' sense of belonging, social-class equality and interpersonal understanding (AbiFarés, 2001; Wittner et al., 2020). These significant influences are not seen in typographic discussions before the emergence of bilingualism and multilingualism in the field of typography. However, the question is, how does a bi-scriptual Latin and Arabic typographic layout play its role in response to these socio-cultural issues?

This research analysis shows the effectiveness of this socio-cultural issues depends greatly on the design quality of the layout. A poor design may negatively influence the readers' engagement, sense of identity and perception of their culture in society.[30] Unfortunately, the primary and secondary research conducted in the course of this study clearly demonstrated bi-scriptual Latin and Arabic layouts as having poor and inappropriate design quality. Designers therefore need training on how to treat Arabic script in coexistence with Latin, and how to improve the design quality of bi-scriptual layouts.

1.1.2.b. Bi-scriptual typography integrates typography with a sense of belonging

The growth of bilingual typography has had varying effects on societies. AbiFarés' research (2010:10) in the Arabian Gulf States revealed bilingual typography as the product of the integration of multiculturalism with a sense of 'belonging'; and raises concerns about 'tradition' vs. 'progress', 'local' vs. 'global', and 'natives' vs. 'migrants'.

Discussions about the influence of bilingual typography have been observed in the field of linguistics. Li Wei and Melissa G. Moyer (2008) affirm in 'The Blackwell guide to research methods in bilingualism and multilingualism 'that bilingual text in the media makes a certain part 'of the world more or less alien than others, more or less distant than the world of the local and the familiar.' Juxtaposition of a local language beside a foreign version gives a

[29] For more information on the importance of hierarchy, please refer to section 6.3.2.a.

[30] For more information, please refer to section 6.3.2.

different identity to the language by making it more global, rather than local, influencing the culture of people associated with the language worldwide. It widens the community 'of viewers and readers that emerge around the mediated' bilingual product. In addition, Li and Moyer (2008) shed light on 'the cross-cultural and international dimensions of cultural identities' through multi-lingual contexts. They analyse the role of text in mass media on politics and the economy, and demonstrate that a bilingual approach is a tool for the media to diminish homogeneous Western culture, rather than simply welcoming non-Western cultures and identities. Such a bilingual approach also aids audiences with a better interpretation and understanding of the message.

Worldwide multicultural businesses in multicultural societies use bilingual typographic layouts to give immigrant communities a sense of familiarity, belonging, citizenship and welcome. For instance, Edgware Road (a part of London with the post codes NW1 and NW9) has been home to many Arab Londoners since the 19th Century (Al-Hairi and Hassan-Hardwick, 2006). Primary research conducted during the course of this research in 2016, analysing bilingual layouts in the area shows that a wide range of local businesses including restaurants, pharmacies, money exchanges, supermarkets and hair and beauty salons use bi-scriptual Latin and Arabic typographic layouts on shop signs, window stickers and projecting signs. This bi-scriptual approach gives a sense of belonging, familiarity and welcome to the Arab-language residents who live in the district. The significant role and success of this approach in attracting more customers is vividly apparent, since almost all businesses, including both recently-established ones and those with a long history, present their names/logos and services simultaneously in Latin and Arabic on almost all display-designed items, including shop-signs, window stickers, menus and flyers. The same phenomenon was observed in Istanbul, Turkey, where most of the typographic layouts were either bilingual or multilingual, rather than monolingual.

1.1.3. Lack of connectivity between Latin and Arabic scripts due to unfamiliarity of designers with script cultures

Research by Nemeth (2006), Paek (2014), Baki (2013a) and AbiFarés (2015) shows that designers make typographic decisions based on the shape and characteristics of their familiar native script. Type designer and researcher Titus Nemeth (2006), states that dual

Latin and Arabic layouts are mostly created by Western graphic designers or Middle Eastern designers who are more skilled in Western layouts and the use of Latin script. Most designers of bilingual layouts are readers and speakers of one script, which means they decide upon the typographic solution for both juxtaposed scripts according to their typographic understanding of the script that is familiar to them. Therefore, the same typographic solution may be applied to two distinct juxtaposed scripts, such as Latin and Arabic, even though they do not have any typographic characteristics in common. As Paek (2014:9) states, 'a designer who is designing for more than one script will be a native reader and speaker of one but not the other(s)'. Therefore, due to not applying appropriate typographic solutions according to each script's individual nature and cultural needs, as Baki (2013) and AbiFarés (2015) have observed, there is a lack of connectivity between the Latin and Arabic scripts.

In this respect, my skill as a native reader of Arabic script in the Persian language and as a bilingual English-Persian graphic designer, tutor and a Londoner adds significant value to the present study. These two scripts – Latin and Arabic – were chosen based on my skills in the use of the Persian language as my mother tongue, and on my fluency and experience of working with the English Language as the result of living and working in England for more than ten years. Furthermore, the use of the two languages for communication in my professional career as a freelance graphic designer for local Iranian-London businesses provides me with valuable experience in working with Latin and Arabic scripts in monolingual and bilingual typographic and graphic design layouts. As stated by John Creswell (2014, cited in Gassas, 2016), the researcher's input into the study, which is influenced by their own experience, is a necessary factor in research, since it shapes both its analysis and findings.[31]

Decisions about typographic solutions for bi-scriptual Latin and Arabic layouts were based first on the knowledge gained through my experience as an educated[32] professional and practitioner[33] of graphic design, designing more than two hundred bi-scriptual Latin and

[31] For more information about my experience please refer to Section 1.1.3.

[32] B.A. in Graphic Design from Iran. M.A. in Communication Design (Graphic Design) from Kingston University, London. Graduated 2013. Currently studying for a Professional Doctorate in Design at the University of Hertfordshire.

[33] I was a freelance graphic designer in my native country, designing with Arabic script. After a short gap, I have continued my freelance activity in London since 2013, designing bi-scriptual Latin and Arabic scripts and mono-lingual works in Latin script. Due to the wide range of clients' needs for bi-scriptual designs, which makes them unique in the market, and a higher number of orders, I established my Graphic Design company – SK Graphic Design Limited – in 2016.

Arabic layouts, such as menus, flyers, posters, business cards, labels and booklets over the last eight years. My clients have successful businesses, such as restaurants, coffee shops, film studios, hair salons, cleaning companies, estate agents, patisseries, money exchanges, pharmacies, cash and carry enterprises and car showrooms and repair shops. They use Arabic script in their native languages, though from differing backgrounds, such as Persians, Arabs, Afghans, Kurds and Pakistanis. In all cases, the clients' interest in advertising their businesses in their native language welcomes and attract their compatriots, while in their adopted society's official language, English, it welcomes foreigners. They are either immigrants who have decided to establish a new business with a prominent element of their culture, or they may already have set up businesses, but request rebranding to a bilingual brand. This gave me the experience of mono- and bi-scriptual designs for different purposes in a range of contexts for people of various cultures, providing me with deep insights into the users' requirements and into how a design or typographic layout could respond to a specific need. Of course, it also improves my communication skills. However, in order to decide on the principles and their role in guiding a bi-scriptual layout, I must first call upon the knowledge I have gained from my experience with typography, collected from academic sources and analysis of practitioners' approaches in responding to typographic challenges for a bi-scriptual layout.

1.2. Research aim

For the first time, this research is going to consider 'bilingual typography' as a new field of typography, by providing a clarification of the definition, and propose categorisation for the field of bilingual typography. Furthermore, it aims to analyse, define and categorise the contexts in which Latin and Arabic scripts sit together, with the aim of identifying the role of principles in ruling bi-scriptual typographic approaches. This approach has been influenced by Noble and Bestley's (2005) observation that[34] the key role in enhancing the design quality

[34] Ian Noble was a British researcher and teacher in visual communication and graphic design who published a book in 2005 about methodologies in graphic design in cooperation with Russell Bestley, a British innovator in graphic design education.

of a graphic design layout, is for the designers to 'pay respect to the design elements.' By commenting on paying respect to design elements, Noble and Bestley emphasise the importance of, firstly, designers' awareness of the relevant graphic design principle, such as contrast, alignment, proportions or repetition, and of typographic elements – typeface, font size and colour. Secondly, they underline the designers' acknowledgement of the significant role each principle has on a layout, both independently and in relation to each other. And finally, they shed light on the importance of the designer's skill in being a professional decision-maker, whose judgement about appropriate graphical and typographic elements, and principles in response to the layout's aim and function and its audience's needs plays a key role in the quality of the outcome (Noble and Bestley, 2005).

Noble and Bestley's findings concerned monolingual graphic design and typography approaches. But their findings are also valid for bi-scriptual typographic practices, especially considering the role of principles on a layout independently and in relation to each other since, in juxtaposition of two distinct scripts, each script is governed by different typographic rules and guidance. In a monolingual typography approach with Latin script, the decision about appropriateness of the contrast, proportion and alignments concerns only the Latin script's characteristics. In a bi-scriptual Latin and Arabic typographic approach, however, the decision must consider both scripts' characteristics, which provides a major challenge. For example, due to different reading and writing directions in Arabic script compared with Latin, a different alignment approach suits each script's needs. The challenge is whether a different alignment approach on a layout for juxtaposed paragraphs, each in a different script, improves the quality of the outcome. The same concern remains about the decisions on typefaces and font sizes, since, due to the different anatomies of letterforms for each script, finding united typeface styles for both may be difficult. The same style may also affect readability of one script.

In conclusion, Noble and Bestley's approach is inspiring, as it pays respect to the design elements to achieve a high-quality outcome. For creating such a high-quality bi-scriptual layout, four issues play an important role, including: the designer's awareness of the design and typographic principles and elements; acknowledgement of each principle's role in a layout independently and in relation to each other, including the relationship between the different elements in a layout; the designer's familiarity with and knowledge of the individual script's characteristics, typographic needs and its guiding principles; and the

designer's ability and skill in making appropriate decisions about the applied principles and elements in response to the script's characteristics, the layout's aim and function, and the needs of the intended audience.

Noble and Bestley claimed that, by acknowledging the design elements, their principles and their different role in differing contexts, designers could guarantee the quality of a graphic design layout that is functional in relation to its aim and is aesthetically pleasing.

Consequently, in order to respond to the problem identified above of poor design quality due to lack of training and academic resources, this study aims to produce a set of overarching guiding principles for creating and improving design quality of bi-scriptual Latin and Arabic typographic layouts, as well as pointing to some caveats and additions that are context-specific. The goal is to:

1. Support designers to produce more effective, high quality bi-scriptual Latin and Arabic typographic layouts.
2. Identify the differing roles of typographic elements on different contexts according to the layout function.
3. Identify those typographic properties of each script that concern bi-scriptual typographic layout.
4. Improve designers' critical thinking in making appropriate typographic and design decisions in accordance with the bi-scriptual typographic contextual objectives and needs.

The aim of this research is to propose principles for bilingual typography practices involving the arrangement of text or letters, regardless of how the types were produced.[35]

The outcomes of this research should benefit two groups: professional graphic designers and typographers; and non-professional designers.[36] As a secondary consideration, this research will also support typographic researchers in describing and analysing examples of bilingual typography more clearly.

[35] For more information about the research remit and analysis of different typographic practices, please refer to Appendix 1, Definition, AP1.1.a.

[36] For more information on differences between the professional and non-professional designers and why considering both groups is important, please refer to Appendix 1. Definition.

1.3. Research Outline

Chapter 1 outlines the necessity of conducting this research by presenting the ubiquity of Latin and Arabic juxtaposition due to globalisation and increased multiculturalism worldwide. In addition, it presents the considerable effects of bilingual typography on socio-cultural aspects of societies. Furthermore, it demonstrates the role of the researcher's or typographer's background in deciding appropriate typographic elements according to the culture of the script. Furthermore, it will justify my competence as an appropriate candidate for conducting this research.

Finally, Chapter 1 outlines the research aim, methodology and contribution to knowledge.

Chapter 2 includes the literature review to identify the role of principles through academic achievements. This chapter also includes a summary of the gaps in the research.

Chapter 3 includes primary research, such as case-study analysis and visual observations conducted in Istanbul, Turkey and in London, the United Kingdom.

Chapter 4, resulting from the analysis in Chapters 2 and 3, proposes categorisation for the field of bilingual typography and analysis of context for bi-scriptual Latin and Arabic scripts.

Chapter 5 provides a detailed analysis of the anatomy of letterforms and nomenclature.

Chapter 6, as the main outcome, outlines the proposed principles and demonstrates their roles. In addition, this chapter presents a critical analysis of the Latinisation approach and demonstrates a practical approach focusing on a Kurdish-Londoner customer.

Chapter 7 encompasses the research conclusion, limitations and recommendations for further development.

1.4. Research Scope

For a better understanding of the remits and focus of this research, readers of this study are recommended to refer to Section AP1.1. in Appendix 1, before continuing with the following sections. Appendix 1 demonstrates that the practice of typography includes practice in typeface design and the arrangement of texts. It provides discussions on the change in the definition of 'typographer', and the change(s) of the typographer's role due to the development of technology. Consequently, it defines the practice of typography – the

concern of this research – which would be the practice of the arrangement of text in bilingual layouts. Additionally, it provides definition and clarification as to what group would benefit from this research, including both professional and non-professional typographers. Finally, Appendix 1 provides definitions and clarification for terminologies used in bilingual typography discussions, as they are used variously and referred to as different notions by different designers. The Appendix provides a critical analysis of the terminologies and clarifies their true notions in the field of bilingual typography and what they mean in this research.

The literature review sheds light on academic bilingual typographic approaches, including the juxtaposition of Latin and Arabic scripts and other coupled languages. Due to the scarcity of relevant academic research on this topic, the review also sheds light on bilingual layouts of other sets of languages, in order to learn from those practices and feed into the juxtaposition of Latin and Arabic. However, the primary research will concern itself only with artefacts in which Arabic and Latin typography exist within the same composition. This will extend to different media, including both digital and physical. The samples include hand-lettering as well as digitally-generated typography.

This research provides an insight into the very different typographic concerns for each bilingual typography categorisation and context. The new factor is that, compared with monolingual typography, in a bilingual approach the relationship between visual forms of two languages acquires importance. In a monolingual typography, of course, the factor of the relationship between the visual forms of two languages does not exist since only one language is present. Therefore, the typographic principles here almost always apply to a variety of contexts. However, in a bilingual typography, because the juxtaposed languages may use similar scripts – solo-scriptual – or different scripts – bi-scriptual – and because the relationship between each language's visual forms in a layout may be different depending on the function of the context, different principles may be needed for different categories and contexts, requiring separate research to identify principles and their roles for each.

The research is limited to the role of principles to simultaneous bi-scriptual layouts in static environments, in the juxtaposition of Latin and Arabic scripts. However, the principles may potentially be generalised to other contexts and categories.

The analysis of context employed in this research is the result of analysing bi-scriptual Latin and Arabic layouts in static environments in simultaneous coexistence, but it may

potentially be generalised to other categories of bilingual typography. Nevertheless, the decision was made not to generalise the achieved classification of context at this stage, since a full investigation and analysis of different effects of typographic elements and type habits and behaviour – if applicable – in different bilingual categories, is required to identify the objectives and audiences' needs in such contexts.

1.5. Contribution to Knowledge

The main contribution to knowledge in this research is defining design principles and identifying their role in the practice of bi-scriptual typography in the simultaneous juxtaposition of Latin and Arabic scripts (Chapter 6). However, there are some secondary contributions, including:

- Categorisation of bilingual typography (Chapter 4, Section 4.2.).
- Identification and definition of contexts for bi-scriptual Latin and Arabic typographic layouts (Chapter 4, Section 4.3.).
- Comprehensive analysis of nomenclatures for the anatomies of Latin and Arabic letterforms (Chapter 5.).
- Proposed terminologies and their definitions for the field of bilingual typography (Appendix 1).

These secondary contributions have resulted in the publication of various articles accepted internationally through blind peer reviews and presented at international conferences. Details of publications and presentations relevant to each contribution are listed in the methodology section which follows.

1.6. Research Methodology:

Methodology is a set of self-imposed rules functioning as a filter to help the practitioner/designer become engaged with the research and make decision about the observations that s/he has seen on the screen about the study (Noble and Bestley, 2005; Harrison et al., 2017). This project shall be described as action research methodology, which

has been recognised as an authorative methodology in the practice of creative design (Swann, 2002). This study was initiated based on a self-reflective inquiry about the quality of bi-scriptual Latin and Arabic layouts in the hope of understanding the challenges and issues in order to improve the practice. As Hung (2021) describes, "action research is a form of self-reflective inquiry undertaken by participants to improve their own practices and understanding of the situations in which these practices are carried out." To meet the aim of this research, I followed the approach of Quang and Hang (2008), by conducting a "solution-oriented investigation that involves problem identification, data collection, reflection, analysis, action, and problem redefinition". Investigations started by acknowledging the needs of principles and their role in the field of graphic design and typography; with a focused problem in mind about the lack of appropriate design quality in bi-scriptual Latin and Arabic layouts. Data was collected through secondary research and visual observations made as part of primary research. I analysed the data, reflected on the findings, and took action by redefining the problem and proposing a solution. Through the later stages of this research, after analysing and reflecting on the collected data, I established that analysis and categorisation of the contexts in which the two scripts coexist would be the only authoritative and valid way to lead to a solution for defining the principles. My observations show analysis of the principles by means of context is a useful way to assess the design quality of a bilingual Latin and Arabic script's layout; and using this approach of 'Analysis of context', I analysed the different functions of these layouts, with the aim of grouping them based on their similar typographic and audience needs. Analysis of context aids in identifying the role and required level of each principle in different typographic layouts according to its function and reader requirements.[37]

During the process of this research, the various findings were presented in typographic conferences worldwide; all were accepted through blind peer review. For instance, a presentation and paper on the outcome of categorisation of bilingual typography (Chapter 4, Section 4.2.), were delivered and published at the 12th Typography Day 2019, IITC Centre, Mumbai, India. Similarly, a presentation and paper on the subject of 'Latinisation' (Section

[37] For more details and information on the reasons for the necessity of 'context analyses' and their role in the outcome, please refer to Chapter 4. Section 4.1.2.

2.5) were delivered and published at the Theorem 2019, Anglia Ruskin University: Cambridge, School of Art, United Kingdom; while a presentation and paper on the outcome of this research on analysis of context for bi-scriptual Latin and Arabic typographic layouts (Chapter 4, section 4.3) were delivered and published at the (ICTVC 7) International Conference on Typography & Visual Communication, Institute for the Study of Typography & Visual Communication, Patras, Greece. In addition, I gave a presentation on the subject of analysis of context at the 13th Typography Day 2020, Applied Science Private University, Amman, Jordan. Finally, I led a workshop at the Typoday 2020 conference on how to improve design quality for bi-scriptual Arabic and Latin display layouts. The questions raised by attendees during these conferences helped me to better identify the audience's needs, in addition to debating potential solutions. Finally, talking through the approaches with experts in the field enabled me to test both my confidence in discussing my research problem and the validity of my approach.

The following sections demonstrate: firstly, the research design, which outlines and the hierarchical steps that I took to achieve the study outcome (Section 1.6.1.); and secondly, Section 1.6.2. demonstrates the influence of established methods on this research data collection used in combination or independently for different chapters.

1.6.1. Overview of research design

To achieve the outcome of this research, a mix of primary and secondary research was conducted in the early stages.. Further analysis of the findings revealed that the secondary approach could prompt further investigations and aid in narrowing down the focus of the primary research, the indings of which, learnt from the secondary research, helped to narrow down the principles. Therefore, a step-by-step approach, as demonstrated below, was created, giving priority to those that are prerequisites for the subsequent stages.

The first step: to identify the role of principles in history and identify the method that popular graphic designers and typographers used to provide a principle. Through critical analysis, it helps to decide on an appropriate approach for creating the principles of this research (Chapter 1, Section 1.6.2.).

The second step: to conduct a literature review, in order to identify principles classifying simultaneous bi-scriptual Latin and Arabic approaches in history. A further step is to build on

existing suggestions where they fall short. Due to the scarcity of literature reviews relating to bilingual Latin and Arabic approaches concerning the practice of arrangement of texts, and since bilingual typography has never been defined and classified, the literature sheds light on various contexts, practices – such as typeface design – and the juxtaposition of a range of sets of languages. The aim was to learn from the best practices in history and identify the principles with the potential for extensibility (Chapter 2).

The third step: to conduct visual observations as part of primary research with two aims: first, to identify best approaches through practice that may have been unique to individual practitioners; second, to analyse whether the principles identified in the literature review played a role in real-life instances of practice. The visual observations also shed light on the role of context (Chapter 3).

The fourth step: to analyse and reflect on data through context analysis. The aim was to demonstrate the findings in a classified and defined way, in order to facilitate understanding of different Latin-Arabic layouts' typographic needs (Chapters 4 and 5).

The final step: to learn from the above four steps and propose design principles for simultaneous bi-scriptual Latin and Arabic typographic layouts (Chapter 6).

1.6.2. The Role of Principles in History

This section provides a critical analysis of principles to identify their role in design history and learn from the methods of creating principles, with the aim of identifying the best approach for proposing principles in this present study.

1.6.2.a. Role of Principles

According to Matthews (1998), it is important for designers to have access to the principles and guidelines at the time of decision-making. The principles guide not only, as Greer et al., (2002) claimed, the first stage of design but, as Mattson and Wood (2014) suggest, they provide fundamental propositions guiding the whole design process albeit, as Kim (2010) explains, the principles must be understandable and easy to apply.

Principles should help design decisions. They ae not meant to be followed blindly, but considered as a set of recommendations to facilitate achieving the goal or solving a problem (Anastas and Zimmerman, 2003; McAdams, 2003; Mattson and Wood, 2014). The typographer and researcher Robin Williams believes 'principle' is knowledge that empowers

designers to recognise the problems with a design and identify how to fix them. In his view, designers may be aware of certain issues or may acknowledge the poor quality of a design, but because those issues have not been designated with a specific name, or have not been discussed, it becomes difficult for them to identify the reasons for the poor quality; therefore they do not know how to fix it or what the solution is. Williams believes that by identifying the issues, giving them a name, defining and discussing them, we could be 'conscious of them, [have] power over them, own them, and control them' (p10). Therefore, the role of principles is to empower designers by recognising a specific problem, understanding the reasons for it, and identifying how to fix it (Williams, 2004).

Researchers (Glegg, 1969; Anastas and Zimmerman, 2003) suggest principles should be effective and appropriate in different contexts without limitation to a specific time; otherwise a principle is just a list of techniques that are useful for specific conditions. In support of the principles, academics and researchers (Sobek et al., 1999; Bell et al., 2004), commented that principles are subject to refinement to adapt to different experiences and conditions. Therefore if, according to the context of experience the principles are not applicable, they are subject to alteration or debate. Furthermore, designers may apply principles to design projects differently (Sobek et al., 1999; Bell et al., 2004). Despite Altshuller's (1994) opinion, that ruling regulations and principles result in the same answer for different projects run by independent researchers, i.e. are generalisable, Perez et al., (2011) demonstrated that principles drive varied ideas in different steps of the design process depending on specific components. Noble and Bestley (2005) discussed the concept that it is up to the designer's creativity as to how to respond to a design problem. The solution to a problem for a similar context may vary. The important role of principles is to empower designers with knowledge and let them achieve power over the issue. Then, individuals may decide on different solutions according to their creativity and background, availing themselves of tools and technology.

The above discussions show that principles 'codify and formalize design knowledge' (Fu et al., 2016:3). Empowering designers with appropriate decision-making by considering context sensitivity and improving their critical thinking by providing problem-solving advice improves creativity. The reason is that, while it facilitates the design process, it allows designers to come up with their own unique solution. The role of principles changes thus from being a specific code of action to abstract advice that can be adapted to different

situations and contexts (Jaünsch and Birkhofer 2006), and welcomes ethical and cultural varieties; simultaneously, it gives designers more freedom of choice than before.

Analysis of typography principles in history (Morrison, 1930; Warde, 1955; Müller-Brockmann, 1968; Lewis, 1967; Ruder, 1967; Tschichold 1991-2006; Hochuli and Kinross, 1996; Kunz, 1998; Weingart, 2000; Bringhurst, 2002; Poynor, 2003; Triggs, 2003; Williams, 2004; Holt & Muir, 2005; Kane, 2011) shows the role of typography principles shifted over time. Kane (2011) comments, the emphasis of classical principles was on craft and print techniques, ruled by limited typographic materials and approaches, such as strong advice on the use of symmetrical layouts, centred or justified texts, and the use of classical serif typefaces. In comparison, modernist typography was about new ways of producing, or on the other hand, as Kane (2011:139) put it, "emphasised on refined production values." Therefore, the restricted principles of the classical approach, that advised use of a specific typographic approach for an aesthetic outcome, changed to considering the values of production advice on considering the transparency and clarity of message delivery.

Beatrice Warde's modernist principle of the *crystal goblet* was about transparency and clarity in conveying the message, which is only achievable through discipline. Overcoming a system that prioritised thought over feeling and a black and white ruling system that did not welcome opposition ruled Warde's 'good' typography (Warde, 2016); which, in McVarish's view (2010), was similar to Morrisons's First Principle. (McVarish, 2010).

In Warde's strategy, Tschichold's 'form' disappears to serve the 'meaning' (Warde, 2016). Tschichold (2006:66) had argued that the whole design was meant to be a "visible form out of the function of the form". His modernist principle of typography leads to use of sans serif typefaces, grouping of information as assigning hierarchy to the status of texts and use of more dynamic and asymmetric layouts. Emily McVarish (2010:289) states that functionalism and new ideas of legibility transformed the old and traditional historic typography to the 'new typography'.

In Warde's view, a typography that visually attracts attention is ugly (Warde, 2016). In comparison, Tschichold's strategy gave equal emphasis to form and meaning, as the visual appearance of the layout – typography – was as important as transparency of the message delivery. Tschichold's functionalist approach firstly emphasised considering 'demand, purpose, raw materials, and manufacturing methods' (p52); and secondly, acknowledged that new forms and visual outcome are welcomed as responding to new needs and content.

In contrast, Warde's principle of suitability and invisibilit, refers to a design that shall be seen through a thoughtful eye and type, while Tchichold's principle of clarity welcomes visual language with capacity of interpretation and physical expression. Despite Warde's strategy, Tschichold's principle opens to 'visible poetry' (p56) but still follows a 'well-organised articulation' (p178) and a rational foundation for typography. For example, Tschichold proposed standardising paper sizes (A4, A3, etc.) at a time when most were using different shapes and sizes of paper. Furthermore, Warde's principles embraced designer's 'disappearance', while Tschichold's principles validated the inclusion of designers in their work (Tschichold 2006; McVarish, 2010; Warde, 2016). Tschichold's principles militate against standardisation of design approach, since in his view standardisation kills individuals' creativity and is opposed to their unique way of expression. Standardisation with a view to mobilising industry for productivity may be an acceptable approach for those industries where a unique outcome serves the guarantee, and the process is more important than the solution. But in the field of bilingual typography, Teshichold is correct in asserting that standardisation is not appropriate since, as he states (2006:112), the design is about "a better way of doing things rather than the only way or correct way of doing things." Design outcome needs uniqueness, a fresh manifestation of a familiar mood, and a new creative solution, which without individuals' decision-making would be unachievable. Tschichold's (2006) principles were in favour of 'pure design', so as to avoid 'personal vanity', and encompass all collective cultures, so as to assure emergence of a general pattern (p29). As Lewis (1967) explained, the successful typographer can go through different channels of taste and fashion; they can also be in the most modern idiom, completely self-effacing. Warde's approach (1920 – 1930s), was not accepted by the designers of the late 1990s (Zuzana, 1990; Burdick and Sandhause, 1995; Kinross, 2004), since for them typographic preferences, such as the use of Times New Roman, are governed by socio-cultural habits. McVarish (2010:299) explained them as habits "formed by historically contingent conventions." In their opinion, the conventional approach of modernism failed to acknowledge the role of the visual form of text and all the cultural associations that the text form encompasses. For Kinross (2004), the role of design is to maximise public accessibility, which necessarily implies welcoming different views and cultures' points equally. However, Kinross (2004:23) principle of 'common sense' for 'ordinary people' so as to welcome Warde and Morrison's strategy of accepting conventional standards of legibility was in

contradiction to his post-modernist contemporaries, who believed in the principle that the standardisation approach has no place in typographic design, due to the need to respect differences and complexity of interests and cultures (Keedy, 1995:32). Post-modernism, as Poynor (2003,129) pointed out, "intended to deconstruct and subvert the formal convention of traditional fictions." Post-modernists were opposed to the idea of rules, i.e. they were opposed to principles that might lead to standardisation.

McVarish (2010) makes the point that the conventional, black and white standard ruling principle discourages graphic designers from critical analysis, which is necessary for them to know themselves. In McVarish's opinion, a design must open questions far beyond 'navigation' and 'transaction' (p302) and provide analysis of the rationale for dominant typographic models rather than structural exposure.

Although principles of post-modernist typography welcome individual expression, this does not constitute disapproval of the principles' role in history. Wolfgang Weingart another pioneer of 'new' typography of the pre-digital age was also a rule-breaker and claimed the most important role of any principle is to open the designer's eyes, by showing different angle of type to them (Haller, 2005). Weingart believed that, even with changes in technology and a new environment, it is essential for designers to acknowledge existing rules, even the ones from hundred years ago, however designers may deploy them in a different way (Haller, 2005).

1.6.2.b. Method of creating principles

Principles usually accumulate from examples of the success of previous experiences' (Bell et al., 2004); however, there is no 'correct', or 'best knowledge' (p149) in typographic approaches, since the majority of guidance is proven empirically, rather than theoretically (Kane, 2011). Learning from prior experience may suggest that principles rely on the rationale behind specific features of specific research investigations. Therefore, as Kali (2008) suggests, to make principles applicable in different situations it is necessary that principles take into account several features from a range of examples.

My method of creating principles is influenced by two items of research, by Bevan and Spinhof, (2007) and Jaünsch and Birkhofer (2006). First, it was influenced by Bevan and Spinhof's (2007) approach in analysing guidelines comprehensively for web usability. According to them, an applicable principle comprises two components: a set of specific

guidelines which is more context-specific, and a more generic set. Secondly, it was influenced by Jaünsch and Birkhofer's statement that principles are no longer instructions 'that can be immediately put into action or thought', but instructions 'on an abstract level which need to be adapted to the current situation of' design needs (p4).

As a result, my guidance and outcome include three sections. The role of proposed guidance in this research is to empower designers with decision-making for identifying the level of principles required, depending on the context.

1. '*Principles*': The principles outline a list of defined parameters with caveats; each parameter may have a different value or role in different contexts. The principles aim to assist designers with making appropriate typographic decisions. Included is a list of principles. with definitions that are identified as sustained issues in bi-scriptual typographic contexts. It is up to designers to decide on the necessity for each principle and its role in a particular bi-scriptual typographic context.

2. '*Contextual considerations*' demonstrate context-specific issues that cause a problem and recommend approaches learned from analysis of the primary research and the literature review of this research. These recommendations advise designers to consider some typographic challenges that may affect the outcome of a design. It improves designers' critical thinking, but gives them freedom of decision-making and the possibility of approaching new and unique solutions.

3. '*Typographic recommendations*' demonstrate typographic treatments that have been identified as the most challenging issues in this research.

1.6.3. Overview of Methods used

In this research, the literature review and visual observations are used as the main approach to gathering and analysing data for the main outcome. However, during this process of data collection and analysis some other established methods listed in this section have influenced the investigations and discussions.

1.6.3.a. 'Why we do what we do and How'

Noble and Bestley's (2005) strategy called 'Why we do what we do and how' had a huge influence on the early stage of the research for self-reflective inquiries and redefining the problem. Furthermore, it led me to consider the importance of questioning as a crucial tool

in designing my guidance as the outcome. Noble and Bestley believe research in design starts by questioning. It leads to investigations toward finding an answer. These answers may result in individual outcomes or solutions that can be demonstrated as an industrial mock-up based on the client's expectations, or they might create a debate in the form of a contribution to knowledge or suggest a new question (Noble and Bestley, 2005).

Noble and Bestley's strategy shows questioning and investigation is an essential part of every design since the possibility of two designs with equal needs is very rare. There is usually a variable according to the context, audience or the market; in any case, they may be created in different periods (Noble and Bestley, 2005). This strategy mostly plays a supportive role and could be used as guidance in shaping designers' critical thinking to identify the best solution, rather than simply being hierarchical step-by-step mock-up guidance to lead towards a guaranteed outcome for research.

These research findings show that the varying contexts of a bi-scriptual Latin and Arabic layout may need different typographic needs according to the context function. To find an appropriate high-quality solution, designers need to question and investigate the typographic needs of the context, which will lead them to identify a solution, which may be exclusive to the context at hand, or it may be valid for another. Without questioning and understanding the context needs, achieving a high-quality design is not possible. Therefore a high-quality design approach for one context may result in poor quality for another. The reason for good design depends to a great extent on the purpose of a typographic composition.

As a result, the proposed principle in this research is not – as pointed out above – a step-by-step guide to achieving a high-quality bi-scriptual design. Rather, it is the designer's responsibility to decide on ruling principles depending on the context's function by asking continuous questions on what, why and how. In other words, through questioning an investigation, the designers must decide which sets of principles among those proposed for this research are applicable and valid for their layout – and, by extension, which are not.

This research provides discussions about the differing needs of typographic categories and bi-scriptual Latin and Arabic contexts, leading designers to acknowledge different typographic requirements. Hopefully, the discussions will ignite questions and investigations that designers need to conduct before deciding on the best solution for them.

1.6.3.b. Generalisation

As Doak et al., (1994) note, theory requires generalisation beyond the data to apply discoveries to other projects. Generalisation played a key role in analysis of this study's literature review. Existing academic research on the practice of the arrangement of Latin and Arabic text was minor compared with the wealth of sources on arrangement of Latin with foreign scripts, and practice of typeface design. Therefore generalisation influenced Steinberg's, (2015) approach[38] used to identify relevant data from other practices and apply them to the practice of arrangement of text in bi-scriptual Latin and Arabic layouts.
The results of the literature review carefully analyse which findings have potential for generalisation to the practice of Latin-Arabic typography in the arrangement of texts. However, the scrupulously-selected sources in the literature review include only those whose approach could feed the practice of Latin-Arabic typography in the arrangement of texts. Familiarity of the researcher with the Latin and Arabic layout's typographic needs and a proper level of critical analysis were necessary to ensure the collected data are authoritative and valid.

1.6.3.c. Content Analysis (Cultural text and quantification)

Content analysis is applied in two sections of this research, each with a different purpose. Krippendorf (1980:40) indicates "content analysis was concerned to analyse cultural texts following 'the ideals' of quantification and natural science methodology." According to Krippendorf's definition, content analysis deals with two elements, including 'quantification' and 'culture'. Considering the 'quantification' element, Rose (2012) similarly suggested that content analysis could account for a large amount of data.
In an analysis of the anatomy of letterforms (chapter 5), especially where Latin is concerned, this research encounters a huge range of differing nomenclatures. Initially, the quantification was not an issue, but the aim was to understand each nomenclature and its relevance to the others. However, the results of this research found a large number of nomenclatures, whose data was difficult to analyse or resolve. The considerable quantity of

[38] Most researchers observed a contradiction between the concept of generalisation and the nature of case-study research, since the latter is defined as precise planning to develop a systematic implementation structure (Stake, 2006; Merriam, 2009; Flyvbjerg, 2011; Stewart, 2014; and Yin, 2014). However, Steinberg (2015) has proposed the concept of resonance groups to 'provide a causeway for cross-system generalisation from single case study'. This present study adapts Steinberg's proposal (made initially in the field of politics), as it is the only available method to explain the possibility of generalisation of case-study research, even in the area of visual communication.

data, regardless of their cultural connotations, made it necessary to use a mix of content analysis methods with 'quantitative research' (Halliday, 2019)[39] to collect data and formulate a pattern.

In addition, content analysis was used in proposing the typographic categories and consideration of context for simultaneous bi-scriptual Latin and Arabic layouts. For this section, the culture of the texts' context plays a bigger role compared with quantification. Reflecting on Rose's discussion, content analysis is applicable for either large or small amounts of data.

1.6.3.d. Research Onion (Inductive and Deductive Methods)

For the development of the principles learned from the practice of typeface design, a mixture of inductive and deductive methods[40] has been applied (Sahay, 2016; Hart, 2011). Inductive reasoning was used primarily in primary research in the analysis of the bilingual typography of shopfront signs of Arab-English businesses in Edgware Road, London (Sections 3.3. and 3.4). Then the observations, evaluation and analysis of the images led to the creation of a pattern and the observation of any layout that includes bilingual typography, including Latin and Arabic typographic composition.

As research shows (Gaines, 2015), in the inductive approach a researcher is part of the research, while in a deductive approach the researcher is independent from what is being analysed (Gaines, 2015). The overall approach here is based on inductive reasoning; the only combination overlaps occur in using both qualitative and quantitative methods in some sections.

Finally, studies have shown that critical thinking plays a vital role as a support to improve the engaged form of practical design (Noble and Bestley, 2005; Rose, 2012).

[39] According to a presentation by Hannah Halliday (2019), quantitative research is a way of collecting statistical analysis or data that can be converted into useful statistics. It uses measurable data to formulate facts and uncover patterns in research.

[40] Sahay (2016) shows there can be a combinative research design which uses a mixture of both deductive and inductive methods.

Chapter 2: Literature review

2.1. Introduction

This literature review analyses academic sources and practices in bilingual typography. The aim is to evaluate existing suggestions for improving the design quality of bi-scriptual Latin and Arabic layouts, to ascertain their effectiveness and to discover which approaches are effective.

In total, 60 sources were identified and analysed, with a focus on bilingual typographic practices. The sources include academic journal articles (10), articles available on open sources such as Gateway and Academia (10), academic reviews (1), panel discussions (1), project reports (5), conference presentations (2), doctoral theses (4), academic books (3), non-academic publications (11), MA dissertations (7) and web/blogs published by practising typographers (6).

The research shows that differing terminologies (some of which are influenced by the field of linguistics) are used by practitioners to refer to the practice of bilingual typography, which made it a challenge to find relevant sources at the first step of this research. Variations include: 'multilingual or bilingual typography or type design', 'typography with multi script systems', 'polyscriptual typographies', 'polyglot typography', 'working with foreign scripts', 'non-Latin scripts', 'visual coexistence' in typography, typography in 'cross-cultural' or 'cultural' diversity, 'multicultural typography' and 'cultural connections in typography'.

For better quality of analysis and ease of determining relevant principles that may contribute towards guiding the practice of simultaneous juxtaposition of Latin and Arabic layouts, contributions are divided into three categories:

A. Resources with focus on Latin and Arabic scripts (Appendix 2, Diagram 1).

B. Resources with focus on English and other languages using foreign scripts rather than Arabic. This category includes multi/bi-scriptual practices such as Latin and Greek, or Latin and Chinese, and also solo-scriptual practices, such as English and Welsh (Appendix 2, Diagram 2).

C. Resources discussing typographic considerations for bilingual typographic practices in general, whether or not commenting on the use of specific languages or scripts in the typographic layout (Appendix 2, Diagram 3).

The main reason for including resources without specific focus on Latin and Arabic layouts is because the majority of the resources, (22 out of 24), while shedding light on practices and principles of bi-scriptual type face design, lack a focus on Latin and Arabic scripts. Only two sources discussed challenges of arrangement of texts in Latin and Arabic. Therefore, the literature investigates discussion of foreign scripts to identify the role of principles for bilingual layouts, regardless of the practice of typeface design.

2.2. Literature Review

Historically bilingualism received more attention in the fields of linguistics, psycholinguistics and sociolinguistics (Li and Moyer, 2008), rather than graphic design and typography. The history of research on bilingualism dates back to the seventeenth century, whereas the majority of research, such as Whitney (1881) and Cattell (1887) – both cited in Li and Moyer, (2008) – was much later and investigated bilingualism's effect on individuals' speech and their brains' reaction. However, research[41] shows Latin and Arabic have coexisted in printed publications since the 13th century[42]; and the number of bi-scriptual Latin and Arabic publications increased in European countries following the invention of moveable type in

[41] The comprehensive chronological analysis through the course of this research identifies bi-scriptual Latin and Arabic printing publications from 1455 till 1811. I conducted a comprehensive visual analysis to identify the best typographic practices that could feed contemporary bi-scriptual typographic layouts. Since the aim of this research is not to conduct a historical approach, the details of analysis are not presented in this study, and they remain for future research. Those practices identified as having the potential to help improve the design quality of contemporary bi-scriptual layouts are presented in Chapter 5.

[42] Research by AbiFarès (2001) about the history of Arabic print shows in the 13th century, under Mogol rules, bi-scriptual Arabic and Chinese banknotes were printed by Arabic block prints in Tabriz. However, the earliest visual evidence dates back to Gutenberg's invention of movable type and the woodcut alphabet in the 1450s.

the 15th century[43]. Despite this prevalence of bi-scriptual texts, there remain numerous instances of bi-scriptual typographic challenges and poor design quality, as analysed in the 59 cited sources published between 1455 to 1811[44].

2.2.1. Bilingual Traffic Signs

K. S. Rutley (1972) wrote a report presenting research initiated at the urgent request of the committee of Inquiry into Bilingual Traffic Signs appointed by the Secretary of State in the UK as the result of inappropriate bilingual English and Welsh road-sign layout that put the safety of drivers at risk. He analysed the role of design elements in improving design quality, with the aim of improving drivers' reading experience, reducing road accident rates and mitigating their safety risks. The results show drivers, according to their age and driving experience, have different experiences in finding related language in a limited time. He suggested limiting the number of words in bilingual road signs to help drivers find relevant language promptly. This research shows that the hierarchy of information on bilingual signs may depend on drivers' intentions in reading the sign, and also the size and the layout of the sign. For instance, on small boards, putting the preferred language on top is necessary for quicker recognition of the relevant language, but this may not be necessary on a bigger board, since there is adequate space between the lines and, significantly, between languages. Consequently, he went on to analyse the financial issues associated with the use of smaller road signs instead of bigger ones.

[43] Print in Arabic from 1455 to 1811 was in the hands of European countries, and my analysis shows that during this period, bi-scriptual Latin and Arabic publications were published in Spain, Italy, England, French, Dutch Republic (Netherland), Germany, Turkey, Portugal, Austria, and Egypt.
In the 19th century, printing presses started work in Arabic script regions, such as Iran (1818), Malta (1822), Iraq (1830), Beirut (1834), Morocco (1845), Algeria and Palestine (1846), Tunisia (1860), Yemen (1877) and Sudan (1881). It is difficult to measure the improvement of bi-scriptual publications at the start of Arabic printing in Arabic script regions.; the publications may have been mono-lingual, mono-scriptual or bi-spiritual Arabic and non-Latin scripts.

[44] My visual analysis of the 59 sources shows that in the earliest examples, due to the difficulty of adapting Arabic script to the printing technology, Arabic visually seems primitive compared with Latin. This results in a lack of visual connection between the typefaces, since each script has a different style.
In the majority of cases, the apparent size of Arabic is bigger; the leadings are inconsistent; the alignment of Arabic in columns with similar width to Latin caused distracting rivers; the Arabic titles and sub-headings are not visually distinguished in the way Latin heading and subheadings are by a mix of different writing styles; the layout of Arabic texts are not consistent with Latin in facing pages; a mixture of Latin numerals with Arabic texts in double-sided alignments causes visual distractions; the mix of Arabic sentences with Latin in a sentence causes reading distractions due to different directions of reading and writing, etc. A detailed analysis of individual publications can be made available on request.

S.L. Jamson et al., (2005) investigated drivers' change of performance when exposed to bilingual Variable Message Signs (VMS) as compared with monolingual signs in different environments. The research demonstrates the greater mental demand made upon drivers and the deterioration of performance according to the workload and surrounding environment. Similarly, Kinnear et al., (2012), in analyses of the bilingual signs on road safety in Scotland[45], commented that bilingual signs increase drivers' tasks, which could be controlled by managing speed, also depending on the road traffic. They demonstrated that different drivers' experience, age, locality and use of different vehicles, such as motorcycles, (Kinnear, et al., 2012:64) all play a role. This research implies that bilingual signs may affect users' performance but context, user experience, knowledge and needs should also be considered.

V. Harjula et al., (1998), wrote a report on the effects of bilingual variable message signs (VMS) with too much Information. S. L. Jamson et al.'s (2001:154) analysis of this report shows "research at the European level has attempted to produce guidelines for best practice (e.g., TROPIC). However [this] basic research has generally concentrated on only one implementation of a sign." Anttila, Luoma and Rämä (2000) shed light on user experience and drivers' gaze fixation time on simultaneous bilingual Finish and Swedish Variable Message Signs (VMS) compared with bilingual VMS where each language is presented alternately.

Jamson, Tate and Jamson (2001) published an article investigating different approaches for bilingual English and Welsh Variable Message Signs (VMS); with specific consideration given to similar visual writing characters (script) that both languages share and to readers' preferred reading language. Like Rutley's (1972) approach, they identified increases in reading time in bilingual layouts compared with monolingual layouts due to larger amounts of text. They found that the hierarchy of information in different local areas such the North compared with the South of Wales was different. In the latter scenario (South Wales), the Welsh language was positioned at the bottom. As a result, Rutley suggested alternating languages rather than a simultaneous presence, since in his view it makes it easier to search

[45] To preserve Gaelic language as part of Scotland's history and culture, and in support of Gaelic speaking communities, bilingual Gaelic and English road signs have been installed in the West Highlands since 2004.

for the requisite language. However, with alternation on a road sign, the necessary language may be absent at the required moment. This article analysed the effect of each bilingual layout on drivers' change of behaviour according to defined parameters, including speed, safety issues and workload on the roads.

Nikolas Coupland, (2010:83), investigating the effect of bilingual road signs in Welsh in terms of the safety of drivers affirms "the main [principle] is equality: Welsh and English must be given equal weighting and prominence, so that the same access is afforded to each language." Equivalence is interpreted in the specific sense that the textual content of Welsh and English must be identical. That is, once again, a choice, based on the assumption that bilingual speakers/readers will be able to choose whether to access the content of a text either in Welsh or in English. Coupland (2010) shows in a bilingual layout that each language's elements should be introduced separately to serve the principle of 'integrity' (p84).

As a conclusion, an understanding of the user's situation and its requirements for exposure of the information is crucial for designers, since the user experience is improved not only by developing the quality of the design, but by understanding better their needs in the moment that they read the information. However, the role of user experience is more evident in this context where the user is in movement, such as on the roads. More analysis is needed to identify different issues that may influence user experience in situations where both readers and the layouts are static. To analyse the effect of user movement in reading bilingual signs, I conducted primary research in Istanbul, Turkey. The outcome of my observations and analysis proves different typographic treatments are needed for bilingual layouts exposed to moving readers compared to those for stationary readers. The analysis and observations shown in Section 3.3. fed into the categorisation of the bilingual layout proposed in Chapter 4.

Furthermore, this section demonstrated a distinction between equality and integrity, which were both proposed as essential principles to consider in juxtaposition of English with Welsh or Scottish, which use the same script. However, the principle of integrity may need a different level of treatment when juxtaposing Latin and Arabic, since the different visual form of the scripts automatically implies integrity. In a solo-scriptual approach equality is

imposed due to similarity of scripts, therefore designers must concern themselves more with integrity.

2.2.2. Brands

Bernd H. Schmitt (1995) discussed the growth of international corporations making it necessary to have appropriate bilingual or multilingual brands. The article sheds light on the role of linguistic and cultural factors in naming and creating the visual identity in an international environment; and underlines that strong sales in East Asia can be partially attributed to an appreciation of these factors.

Soheil Ashrafi adds to the debate in his 2015 article, *Bilingual typography considered from the standpoint of Bakhtin's dialogism*. His definition emphasises the necessity of 'dialogism', to the extent that a script becomes illegible in the absence of a co-existent script. However, while not applicable in all bilingual contexts, it is relevant to hybrid logo designs.[46]

In 2016 Fouad Gassas investigated the adaptation of global brand logo marks in Arab regions. His observations include the idea that "logo marks are still not always adequately designed and managed when adapted to different markets with a new language, script, and culture" (piii). According to his analysis, the Arabic language was integrated into packaging, signage and advertisements in an 'unstructured style' and the poor-quality Arabic logos in the region caused 'visual pollution' (p1). 'Awkward brand name translations' and 'mismatched typography' (p1) make the new bi-scriptual logo approach alien to the rest of the corporate identity. Gassas provides guidance on the adaptation of logo marks from Latin to Arabic scripts and calls this practice 'customised lettering design' (p2). He argues against the prominent Saudi Arabian culture and religious influence on the visual identity of the logos.

However, his claim considering the Arabic language, that its written script can be considered a badge of 'Islam', may not be entirely valid. The growth of globalisation and increased migration results in many Arabic language and Arabic script users living in and adopting the culture of a second society while still using their mother tongue in communication for

[46] For more information about variety of bilingual typographic contexts, please refer to Chapter 4, Section 4.3.

various reasons. The ‘badge of Islam’ and cultural attachments may be significant for bilingualism only in local areas or contexts that target specific local markets. As research by Houwing and Grenier (2005) shows, for a multicultural environment, the culture and religious attachments may need to remain unbiased.

Gasses conducted a literature review investigating whether ‘standardisation’ (p21) may be a better approach than ‘localisation’ (p22). Standardisation results in having a common approach in name, typography and colour of a brand for all markets. In support of his thesis, his analysis shows the world is becoming more homogeneous so, despite the variety of cultures, customers of the same brand share similar needs (Cutler and Javalgi, 1992, as cited in Gassas 2016). This reduces costs and sustains consistency (Harris, 1996, as cited in Gassas 2016), and provides similar, clear communication. But his analysis shows that those with standardised design approaches tend to neglect ‘local linguistic attributes’, ‘local culture’, ‘nationalism’ and the ‘nature and attributes of local market’ (Melewar and Saunders, 1999, as cited in Gassas 2016). He offers localisation as an approach, which means customising the design to meet different audiences’ needs with respect to culture, linguistics, religion and geographies.

In conclusion, the aforementioned discussions show that. due to the increase of multiculturalism, a script’s identity is no longer defined by its history and the culture of its user environment. But the script’s identity will be redefined according to its use in a multicultural environment, welcoming the cultural inclusivity of, for instance, third generations in foreign societies. This prompts two opposed concerns for juxtaposition of Arabic and Latin scripts in different environments. The aforementioned discussions demonstrate that it is time to detach Arabic script from Islam and present this religion-detached script to respect the third-generation citizens and all Arabic script readers who may not follow the faith of Islam. This is true for bi-scriptual practices in a multicultural environment, as there is a need for ‘inclusivity’ of readers, regardless of the Islamic origin of Arabic script. In contrast, we must acknowledge that the pattern of users’ reading behaviour depends not just on the user’s reading skills and visual experiences, but is also influenced by political, economic and social issues that govern the rules of the district. Therefore, in local Arabic regions Islamic attachments to the Arabic script may still need to be considered.

Furthermore, the discussions in this section show that different bilingual layouts may need different typographic treatment, not because of using different scripts, but because of different aims and function of the typographic layouts. It means different layouts that encompass juxtaposition of Latin and Arabic may prompt different typographic concerns. To validate the authenticity of this issue, an observation conducted through the primary research in Edgware Road, London (details provided in Section 3.4) indicates analysis of context (Section 4.3) as a solution to identify the typographic needs of bi-scriptual Latin and Arabic layouts.

Finally, the discussion reflects on overloading, but not in terms of information, but the overloading that is caused by use of very contrasting visual approaches. It proposed customisation as a tool to simplify the visual outcome and makes it easier for the user to digest the message. However, it has been identified as a flawed approach by other designers. Consequently, my investigations show the approach could be welcome in a specific context, but its significance may differ in different situations. This issue must become the main consideration for creating the guidance in this research. However, to aid designers to understand the reasons for a principle to have different roles in different contexts remains the main challenge, since the practicality of the guidance is not about proposing a solution for specific case; bits success depends on improving designers' thinking and decision-making process, to make them professional decision makers who are capable of deciding on the appropriate approach in different contexts.

2.2.3. Multilingual, multi-scriptual books

Walker's (2001) work concerns the Multilingual Resources for Children Project (MRCP), looking at bilingual resources in English and the main minority languages in the UK: Bengali, Chinese, Gujarati, Punjabi, and Urdu. The project analyses status differences in terms of the languages used, the quality of translation and the visual organisation of the two languages in 'dual texts' (p51). In summary, the status differences seen in the mix of handwritten text and typesetting was the main concern for teachers and children, since they believed both languages should be presented in the same way: the handwritten language seems subsidiary compared with the typesetting. However according to the teachers' experiences,

the handwritten version of Nasta'liq was more acceptable compared with the typesetting, due to the graphic complexity of Urdu. The handwritten version was more accurate and appropriate for teaching and learning, since the letters are more legible[47]. This project also identifies how letterforms, type size, space between the lines, the amount of text on a page and the positioning of one language in relation to the other all play a role in how a language is perceived in a dual text. For instance, the children perceived the language with bigger and bolder letterform at the top of the page as more significant. Furthermore, they commented negatively on the different spaces between the lines of each language, noting the effect on legibility and ease of navigation of a page.

Financial constraints may result in the use of the same English template for dual-language children's books. In the case of reading direction for right-to-left scripts the book is opened from the 'wrong' end (p52). The children perceive the language in the bigger text as more important and of primary importance. In conclusion, Walker (2001) comment that a rule is needed to communicate effectively.

Sadak and Zhukov (1997), in recognition of graphic designers' need to employ more than one language within a single print format as the result of the global marketplace, wrote a book entitled *Typographia Polyglotta*. It presents the problem of the different length and spaces that a Latin text occupies in comparison with the same text translated into 22 languages. They provide hints on different typesetting needs and linguistic differences for each of the 22 languages, though without guidance on how to treat each case. Arabic and Persian texts were treated separately, demonstrating that two languages using the same script may require different typographic considerations. For example, the frequency of ascenders and descenders and the texture of layout differ in each language and may vary because of the different frequency of letterforms. Also due to the nature of translation, the amount and length of text in each language may be different.

Ballim et al., (1998), shed light on the importance of accurate alignment for data in multilingual documents. They claim inappropriate alignment of text, without concern for each language's needs, causes 'proofreading problems' (p464), and affects the quality of the document negatively. They propose new systems of codes and tags to approach accurate

[47] This shows that the technology was not suitable for the Nasta'liq typesetting and its shape of letterforms.

alignment for translators of multilingual documents. However, there is no overall design analysis for aligning juxtaposed scripts in this source.

Walker (2001), in her book *Typography and Language in Everyday Life: Prescriptions and Practices*, discusses the inappropriateness of designers' approaches in treating non-English texts as secondary in bilingual layouts, by first planning spaces, typographic characters and needs perfectly for Latin and then squeezing the second language in without any concern for the language's space and typographic requirements. She invites designers to consider each language's space requirements and consider language needs simultaneously.

In conclusion, practitioners still considering Arabic calligraphy competence for evaluating Arabic script needs, without considering the detachment of calligraphy from typography. In analysis of typographic needs for bilingual approach, it would be wrong to compare calligraphic style of one script with typographic style of another script. For instance, this section shed light on usefulness of calligraphic style in improving Arabic script's legibility, but later analysis in this research proved Arabic calligraphic style which is distinguished from Arabic typography, is not in favour of visual harmonization with Latin typography.

2.2.4. Unicode

The Association Typographique Internationale (ATypI), in their conference on *MultiTypo* in Lyon, France in 1998, demonstrated advanced features for standardisation of Unicode, which benefits practice in multi-script type design. In the subsequent years, the University of Reading, and the International Unicode conferences, opened discussions about challenges and typographic concerns of non-Latin typeface design benefiting multi-script typeface design48. ATypI at Copenhagen in 2001 and Rome in 2002 described the challenges of 'extended Latin typefaces', the complexity of non-Latin scripts including Arabic and the role of technology in handling these complexities in the typeface design process and outcome.

[48] As multilingual typesetting has grown, working with foreign languages has come to the attention of practitioners (Milo 1997; Milo, 2002) and opened a path for them to investigate its typesetting and typographic challenges. These efforts however emerged as the growth of multiculturalism and their influence on typographic decisions for bilingual approaches was indirect; we theerefore do not consider them as a multilingual resource in this literature review.

This presents bilingual approaches in typography have received attention since the late 1990s. However, the majority of the discussion in the academic field shed light on the practice of bi-scriptual typeface design, rather than arrangement of texts. One reason may be the fact that typeface design has become a profitable profession, especially due to its increased need in branding, which has led graphic designers and typographers to focus on it more. In comparison, the practice of arranging type received less attention and remained as a skill of graphic designers. But, with the emergence of digital platforms, successful arrangement of text plays a more important role. In addition, arrangement of bilingual text is no longer limited to mass production.

2.2.5. Cultural considerations

Culture on its own is a ubiquitous complex phenomenon (Hall,1997:2; Rose 2012:2)[49]. This section sheds light on different cultural issues, that must be a concern of a bi-scriptual layout.

2.2.5.a. Culture of a script

2.2.5.a.i. Linguistic considerations

Research in the field of linguistics shows how different linguistic structures of a script influence our perception of objects. The readers of other scripts, therefore, may have a different view of the world. According to Whorf (1956:221), “users of markedly different grammars are pointed by their grammars towards different types of observations and different evaluations of externally similar facts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world.” Readers of different scripts may read the same information, at the same time and in the same location, but because of the different linguistic structure of their language they may gain a different understanding of the message. Therefore, their reaction to the typographic layout may differ, depending on the context. This implies, as the literature review shows (Aronin and

[49] Hall (1997:2) claims “culture depends on its participants interpreting meaningfully what is around them and making sense of the world in a broadly similar way.” Hall’s and Rose’s (2012:2) argument in defining culture considers a complete range of factors including political, religious, economic, social and visual issues that affect people’s view and understanding about the surrounding phenomena, and their reaction to specific phenomena.

Hufeisen, 2009), that bilingual typography brings typography and linguistics closer than ever. This requires designers to be aware of its linguistic implications (Walker, 2001). However, the need for this knowledge may be different from one context to another.

2.2.5.a.ii. Conventions with typographic matrices and anatomy of letterforms

Our understanding about the phoneme and meaning of each letter depends on recognition of the letterform according to its specific shape (Meggs, 1983). Therefore, the visual appearance of writing symbols and the meaning behind them becomes part of the collective visual memory of readers. Studies on bilingual layout shed light on the use of appropriate punctuation marks (Wittner et al., 2020) that are familiar for a society's audience. Apart from the shape of a punctuation mark, which might be different in different scripts, their position may be different.[50] For instance the shape of colons, question marks and semi-colons are reversed in Arabic compared with Latin. Also, due to different reading directions, the rules of spacing for information inside parentheses are different in Arabic compared with Latin. In addition, the function of a punctuation mark might be different in different scripts[51].

In April 2003 Blankenship[52] wrote on the question of expertise in integrating design and typography ideas with culture. Her article, entitled *Cultural Considerations: Arabic Calligraphy and Latin Typography*, revealed the challenge of marrying Arabic and Latin cultures on typographic layouts due to the diametrically-opposed natures of the Arabic and Latin scripts. She claimed that the imposed culture negatively affects the structure of the script and visual shape and anatomy of the letterforms. She argues that the anatomy of Arabic script remained 'abstract' and 'complex', to encourage readers' 'contemplation', which is an aspect of Arabic culture, Arabic people being religious and 'internal thinkers'. By contrast, the anatomy of Latin letterforms is 'simple, 'formal' and 'geometric', since Latin

[50] Leonidas (in Wittner et al., 2020:134) discussed a mistake a non-Greek designer may make in a bilingual Greek and Latin layout, where s/he becomes confused about the dot and semi-colon because they are presented in different shapes or locations in Greek typography compared with Latin typography. The Greek question mark is identical with the Latin semi colon (;), whereas Greeks the semi-colon takes the form of a full stop at x-height (Wittner et al., 2020:134).

[51] Keith Tam, in the analysis of bilingual Hanzi and Latin scripts presents the function of punctuation marks for single and double quotation marks, noting that they are different in the People's Republic of China compared with Taiwan (Tam, 2020:209).

[52] Sherry Fresia Blankenship is an associate professor in the subject of cross-cultural design at the Taylor's University of Malaysia.

culture follows a Western emphasis on 'industrialisation' and 'diversification', as well as concerns about 'efficiency', 'progress', 'production' and 'clear communication' (pp61-62)[53]. Blankenship argues that the real differences between the two scripts lie in their different technical and cultural developments. She believes Latin typography is separate from its calligraphy, so Latin script developed and adapted to the technical development of each era. Arabic typography, however, has not completely separated from its calligraphy[54]. The aesthetic and technical aspects of Arabic developed slower than the technological advances of each era. Therefore, Arabic had to follow the technical development used by Latin to allow these two scripts work together.

In her view, acknowledging and accepting Latin and Arabic scripts' cultural differences is necessary in order to achieve appropriate design quality. She recommends that designers should avoid personal prejudices since they may disrespect or disregard each script's cultural needs and characteristics.

[53] Different views of Arabic script readers compared with Latin script readers have been a point of discussion by other researchers (Patai, 1993; Blankenship, 2003; Kapp, 2011). The cultural anthropologist and historian Raphael Patai (1983), in his book, 'Arab Minds', argues that the East believes the world is internal to the human being, while the West worldview thinks the world is external. In this respect, research shows (Patai, 1983; Blankenship, 2003) Arabic calligraphy follows the ideas in mind with the belief that perfection and complexity has primacy over the external world. Chahine (2012:25), believes the reason for achieving an 'internal' and 'perfectionist' belief is the rise of Islam amongst Arabs, which changes the oral tradition of the pre-Islamic Arab world to a written one. "The Arabs in pre-Islamic times relied on an oral tradition. Literary works such as poetry were memorised and passed on from one generation to the next. The rise and spread of Islam changed all that" (Chahine, 2012:25). Writing down and documenting the Quran and Hadith for future generations gives writing in Arabic script a high value. Therefore, Arabic calligraphy must represent the high value and holiness of the contents [1]. In contrast, in the analysis of Latin script, Blankenship (2003:61) indicated that the visual appearance of recent refined Latin letterforms follows the rules of the external world influence of technology, which brings the Latin script closer to a 'commercial application' (cited in Blankenship, 2013).

In this regard, Kapp (2011) emphasises the connection of the lifestyle and culture of Arab people to the cursive feature of Arabic script. According to him, "Arab society is based on family ties and social circles, with wide circles of friends in frequent contact. As the letters move in groups, so do the people" (Kapp 2011).

[1] This gave the art of calligraphy a spiritual role and gave high government posts to Calligraphers' (Blair, 2006:157; Lehman 2012). For example, as Blair (2006:157) observed, "the famed calligrapher Abu 'Ali Muhammad Ibn 'Ali, usually referred to as Ibn Muqla, who served as vizier three times during the Abbassid period between 928 and 936 AD. Another contributing factor to the rise of calligraphy in Arab culture was the ban on figural representation in Muslim art. The role of calligraphy then expanded to encompass the writings of holy texts and the decoration of buildings, tapestry, metal, ceramics, and many more artefacts that were used in everyday life. The inclusion of a decorative band of calligraphy on a household item or at the entrance of a building provided a blessing or barakah to the owners. As such, the Arabic script is more than the sum of its characters. It has strong religious and cultural ties that have on the one hand-propelled it into the highest level of art forms, and at other times have proved to be difficult to negotiate".

Besides, as Lehman (1980) shows by creating rhythm and decorative patterns, Arabic typography emphasizes timelessness. In this case, because of the importance of belief and perfectionism, Arabic calligraphy master's patiently spend hours learning to follow their ancestors (Petsopoulos,1982:169).

[54] She describes Arabic typography as a 'mechanized version of calligraphy' (p63).

2.2.5.a.iii. Typographic characteristics

Finally, as part of a script culture Wittner, et al. (2020) point out that different scripts have different baseline systems: while Latin letterforms sit on a singular baseline, in some Arabic styles the letterforms sit on multiple or slanted baselines. Chinese characters are centrally aligned with the horizontal axis, and in Devanagari the letters are suspended from the headline.

Also, not all scripts follow a consistent proportional system: while Chinese characters all follow the same width and height, Arabic letterforms have varying widths and proportions.

Finally, not all scripts follow the same reading and writing direction: while Latin is written and read from left to right, Arabic and Hebrew are read right to left[55] and Chinese and Japanese may be read either from top to bottom or from left to right.

In the context of the discussions above, culture refers to the unique identity of a script distinguishable by its visual properties and linguistic and typographic characteristics. These characteristics are an inseparable part of the script: objective properties and are not subject to change. For instance, Arabic anatomy of letterforms is different to that of Latin, which requires different typographic approaches for the sake of readability (Chapter 5), Arabic is a right to left script which is opposed to Latin's reading and writing direction, and so on. In this study. I refer to this aspect of culture as the '*Culture of a script – Script's culture'.*

2.2.5.b. Readers' cultural background

In contrast, in other typographic discussions culture has been thought of as social conventions that shape the user's behaviour and experience.

2.2.5.b.i. Collective visual memories

The researcher and Arabic typographer Nadine Chahine, in a culture and typography talk in 2012, defined culture as part of our 'collective visual memory'. Readers' reading experience and level of understanding would be different, depending on their familiarity with the visual shape of written elements. Chahine, in International Design Week (which took place in

[55] We should consider that Arabic letters are written and read from right to left, but Arabic numbers are written and read from left to right. With combinations of Arabic letters and numbers in the same sentence, two different directions of reading apply.

2013), stated that the typographic layout is supposed to be seen and should identify the 'view of the audience,' 'rhythm' and 'architectural style' of the city in that specific environment (Chahine, 2013). For instance, in earlier discussions light was shed on the visual similarity of the number five in Arabic with zero in Latin. However, in other Arabic script user societies such as Iran, the number five is presented as an upside-down heart shape. It has an extra stroke at the bottom which distinguishes it from a rounded zero. This shows that the visual memory with respect to the familiarity of readers with visual elements of a script is also influenced by local taste.

The script's style which determines the apparent size and visual structure of letterforms is another issue to consider as part of readers' visual memory. Arabic script's readers from different regions prefer different styles of Arabic script. Iranian graphic designers and illustrators (Mesghali, 2015) commented that typefaces based on the 'Naskh' style[56] is preferable in Iran. Mesghali (2015) notes the reason is that the invention of Arabic moveable types in the seventeenth century used for Persian book printing and transcribing the Quran was based on the Arabic Naskh style. In contrast, according to Chahine (2012:50), Iran and Pakistan use mostly the Nastaliq style. Mansour (cited in Leonidas, 2015) comments that the accepted style for Arabic script is Naskh, but in areas where Urdu, Pashto, Bengali, Panjabi, and Sindhi, are spoken, the preferred style is Nastaliq. Moreover, Zoghbi (2015:47) claims 'Thuluth is the most elegant Arabic script', hence, the Thuluth style should be in a 'font family' in Arabic. As a result, the typeface 29LT Zeyn was created by Zoghbi and Party, based on the Thuluth style. In his recent discussion in *The Eye* magazine, Zoghbi (2015:47) states: "These were added to enhance the script's 'elegance', and 'elegant' is, after all, what Zeyn means." Finally, Captan and Sarkis (2020) state that the Kufic style is more used in Central Asia (mainly in Uzbekistan).[57]

As part of my professional career as a bilingual graphic designer based in London, I have observed clients of different nationalities – including Persian, Arabic, Afghan, and Pakistani,

[56] In creating an Arabic typeface, the letterforms must draw based on a calligraphic style (Paek 2014:57; Mesghali, 2015; Zoghbi, 2015; Chahine, 2012; Kapp, 2011). The designer's decision about the base of the Arabic typeface's style is made according to the cultural background and purpose of the typeface.

[57] In general, seven Arabic script styles are best-known, including Naskh, Reqaa, Thuluth, Nastaliq, Dewani, Kufi and Rayhani. However, Arabic calligraphic styles are not limited by these seven styles. For more information, please refer to AbiFarès (2001, 18:41).

who all use Arabic script but come from different nations and societies – prefer different styles of Arabic script typefaces and a different design layout. For instance, my experience shows that Persian business owners want to ensure the design and the style of their brand represents the Persian culture, rather than Arabic or other cultures, and vice versa. Routley (1972) observed the same issue in research into bilingual English and Welsh traffic signs that audiences of different languages with the same script use, and accept, different design styles. As Routley (1972:8) mentioned, "the uppercase version was not aesthetically acceptable to the Welsh" because although both English and Welsh languages use Latin script for their writing systems, the uppercase style information was not as readable for Welsh drivers as it was for English drivers.

2.2.5.b.ii. Detachment of a script from religious bias

Social beliefs and religious background influence the content used in a typographic layout (Kapp, 2011). For example, in an observation about typography layouts in Arabic societies Kapp states: "the content of an Arabic typography and advertis[ing] in most cases is restricted to Islam and religious beliefs."[58] This means there is a religious context where Arabic and Latin script may sit together, but that it may not be applicable to the juxtaposition of other scripts in other societies. The effect of Islam and spiritual culture on Arabic script typographies is that, Unicode created extra Arabic 'notations' strictly for Quranic usage (Chahine, 2012:23).

However, a bilingual layout with religious content needs different consideration compared with a bilingual layout without any religious associations. According to Diringer (1968:210), "Arabic is a religious script whose spread followed that of the faith of its users." During the expansion of Islam, the Arabic script was used as an exclusive device for communicating Islamic principles. As Al-Samman (1980) pointed out: "the believer had to read the Qur'an only in Arabic" and translations were not recognised. However, this observation is mostly valid for typographies within a Muslim community; Arabic script nowadays is spread worldwide and is used in many regions without any specific religious link. As recent Arabic typographers (Reilly, 2012; AbiFarés, 2015; Boutros, 2017) affirm, it is time to detach Arabic

[58] In Muslim countries, it is contrary to Islam to write against the Prophets or the Quran. Also, lingerie and alcohol advertisements are forbidden. Political aims could also influence this.

script from its traditional calligraphic and religious attachments. AbiFarés (2001) suggests focussing on the present needs of Arabic typography and disconnecting typographic approaches from the calligraphy of the past and the Islamic faith. Houwing and Greiner (2005), in their article *Design Issues in Multilingual Applications*, discuss challenges in a slightly different context: for the Voice User Interface (VUI). They discuss users of different cultures having a different notion of what intuitive effect is in terms of their culture, environment and experience. They conclude that design for a multilingual application in a multicultural environment must remain unbiased politically, socially and culturally, and must avoid gender bias. This implies that the layout must remain unbiased in favour of inclusivity and this approach could assist in developing the script to meet the needs of modern technology.

In conclusion, the context determines the need for attachment or detachment of Arabic script from the Islamic faith. Sometimes we must keep the Arabic script detached from Islam to reflect inclusivity in multicultural environments. At other times, we must consider its association with Islam in local Islamic regions.

2.2.5.b.iii. Cultural sensitivities due to social diversity

Baur and Felsing (2016), in their article *Researching visual application respectful of cultural diversity*, analysed the coexistence of Latin and Chinese in urban contexts. They discussed cultural sensitivities and social diversity policies and identified factors that influence users' patterns of perception through visual communication, specifically in relation to bi-scriptual Chinese and Latin layouts, including diversity in relation to migration, and ethical and marginal issues, such as elderly people with disabilities.

This aspect of culture refers to user experiences that affect the reading process regardless of the script's visual properties and is subject to change according to environmental and social changes. For instance, personal behaviour or perception may change due to aging or an atypical lifestyle experience at different periods of time (Rose, 2012). It is essential to distinguish this aspect of culture from the culture of a script and define it for the purpose of clarification, simplification and better understanding of the concept. In this study, I refer to this aspect of culture as the 'readers' cultural background'.

2.2.6. Design

Typographer and poet Robert Bringhurst (2002:107), in his analysis of typographic styles, claims: “the more closely different alphabets are mixed, the more important it becomes that they should be close in colour.” Bringhurst’s use of colour does not refer to the ‘hue’, but it concerns the overall texture and grey tone created by the texts according to their relationship with the background.

Chahine (2004) describes the use of cut-and-paste and rotated and flipped Latin anatomy to create Arabic counterparts. Naming it the ‘Frankenstein of Arabic typography’ (p8), she suggests it is a growing phenomenon in the Arab region – specifically Dubai and Beirut – for creating logo marks, commenting that this approach comes from designers’ lack of skills in working with Arabic script.

Papazian (2005), in his article *Latinisation: prevention and cure*, briefly shed light on designing multi-script layouts. His article criticises the ‘chauvinism’ of Goudy and Schonfield in their worship of Latin script as a flawlessly-designed script. He claims this negatively affects the design of non-Latin scripts. ‘Latinisation’ is the adoption of a Latin typographic approach and a guideline for non-Latin scripts. Papazian discusses the pros and cons of Latinisation through analysing three approaches.[59]

He argues that for a bi-scriptual layout designers must first achieve ‘visual harmony’ by matching and aligning elements and, secondly, must maintain each script component’s ‘integrity’ in terms of ‘cultural authenticity’ and ‘readability’. In his opinion, the way these two factors achieve ‘balance’ depends on how the two scripts co-exist in the layout. For example, he argued for the importance of ‘demoting formal harmony’ and preserving ‘authenticity’ and ‘functionality’ in a parallel layout[60]. In Papazian’s opinion, visual harmony may put one script in a secondary role and diminish its integrity.

Perez (2012:2), commented that “the resonances between different writing systems may be something worth keeping”, while Saxena (2020), in her blog ‘Beginners’ guide to multiscript typography’ also discusses the importance of harmonization, but in terms of size and weight. She comments that applying the same strokes and weight to both scripts’

[59] For a definition of Latinisation, please refer to Section 2.4.

[60] For a definition of ‘Parallel Layout’, please refer to Section 4.3.2.a.

letterforms will not automatically provide equal weight and balance, because different diacritics of a script may influence the script's texture. Saxena writes that copying from one script to create other script letterforms may disrespect the adopted script's calligraphic heritage. As a solution, following Papazian, the use of an appropriate typographic colour or apparent size could make another script 'compatible' (p35).

As Papazian argues, there is no generic approach to designing a typeface since a 'good performance' (p35) must be evaluated according to the situation. Although his analysis considers only typeface design, it is also true for the practice of creating bilingual layouts. Nemeth[61] (2006), in *Master of Arts in Typeface Design, 'Harmonization of Arabic and Latin Script': Possibilities and Obstacles,* analysed typographic challenges for creating harmonized bi-scriptual Latin and Arabic typeface design[62]. His aim was to achieve a level of harmonization, despite different orientations in reading and writing, various lengths and body sizes of texts, varying grey textures of blocks[63] and the different use of Cartesian space[64] in Arabic script compared with Latin script. In his method of harmonization, preserving the cultural heritage of each script by avoiding distortion of each script's visual form is important. Nemeth lists principles for achieving harmonization in bi-scriptual Latin and Arabic typefaces, including 'apparent size'[65] (p6), 'colour' (p7), 'contrast and modulation' (p7), and 'stylistic elements' (p8). His principle of colour refers to overall 'colour balance' in the coexistence of the two scripts that are influenced by each script's weight, which is determined by the structure of strokes and their pattern in the anatomy of

[61] Titus Nemeth is a modern bilingual designer who is not a native reader of Arabic script.

[62] Nemeth used the term 'typeface family' to refer to typefaces including different languages or scripts. But as described in Appendix 1, I defend the use of this term in this study instead of using bi-scriptual typeface design.

[63] I use the term Grey Texture to refer to Nemeth's (2006) description as 'unbalanced colour of text balance on a page'.

[64] Different uses of 'Cartesian space' in Arabic script compared with the Latin script: results from different leading. The term Cartesian, was first used by Peter Enneson 2005: "Cartesian space is space conceived in rectilinear (x,y, or x,y,z) coordinate terms. For type, this means thinking about how different typefaces or different script systems use vertical (x) space and horizontal (y) space." (typophile.com, 2.12.05)

[65] With respect to size, Nemeth divided Latin script's Cartesian space – the space that defines the apparent size of a letterform - into three areas. Papazian (2005) also used this term. According to his analysis, assigning the same Cartesian space to both Latin and Arabic scripts will result in equal proportions, but a distortion of the Arabic letterforms.
For the same pragmatic reasons, the opposite approach of applying the five-area Cartesian space to Latin script would not solve the problem, since in this approach the descender height for the strokes of Latin script increase and result in re-formation of Latin descenders.
Nemeth did not propose any solution for the aforementioned problem and left it to the designer to find a way to achieve balance in the size of juxtaposed Latin and Arabic scripts by potentially finding a way to equalize the tallest stroke of Latin with the tallest stroke of Arabic letterforms.

letterforms[66]. The anatomy of Latin script consists of more vertical strokes while the Arabic script consists more of horizontal. In his view, different structures of the anatomy determine the weight of the script. These play an important role in achieving a colour balance between Latin and Arabic.

According to Nemeth's analysis, Arabic does not appear as linear as Latin. There are different rules of line spacing (leading) and letter spacing (kerning) between Arabic letterforms compared with Latin which affect the colour balance of the layout, therefore "assigning the same leading to both scripts of the same point size results in very generous leading on the Latin side, whereas Arabic shows a conventional interlinear space"[67] (2006:7).

Grant (2006), wrote an article *Angelynn Grant talks with three designers [Gary Munch, Gerry Leonidas and Adam Twardoch] about multilingual type design*. She writes of the necessity of consulting an expert familiar with the script, since the designer of a bi-scriptual type may not be familiar with one of the scripts.

Boutros[68] (2009), in *Talking Arabic*, argues that the need for bi-scriptual Arabic and Latin approaches emerged in the 1970s to 1980s with international brands' logos either converting Latin letterforms to Arabic or creating new, original, Arabic letterforms. Boutros proposed guidance for creating typefaces for bi-scriptual logos in response to the lack of an appropriate Arabic typeface for harmonising with Latin script[69]. He claimed this gap is the most problematic challenge for designing a bi-scriptual Latin and Arabic layout and provides a comprehensive analysis of differences between the two scripts. Arabic society's needs, religion and culture play important roles in his design approaches and discussions. However,

[66] Weight, in a typographic context, refers also to different styles of a typeface, such as regular, bold, italic. etc. (Samara, 2014).

[67] However, the linear structure of Latin script is more prominent in uppercase since all the letters achieve the same body-size.

[68] Mourad Boutros and in cooperation with Arlette Boutro has, since 1966, focused on meeting the technological needs of the Arabic-speaking world. He is a partner in Boutros International and led the field of Arabic creativity, typography, calligraphy and design for more than forty years.

[69] According to an anonymous survey of freelance bi-script Arabic type designers attending the Typoday 2019 conference in Mumbai, India, most of the designers for bi-script typefaces, including Latin and Arabic scripts, just create display bi-script typefaces. The survey found designing bi-script typefaces, including Latin and Arabic scripts for body-size, is a challenging task, because designers have problems with the issue of readability for Arabic script. For more information about Arabic script readability, please refer to Chahine 2012.

religious and cultural concerns may be different for a local approach compared with a global perspective.

In a multicultural environment, the rule of inclusivity (Li and Moyer, 2008[70]) calls for a unified approach. For instance, in multicultural societies, such as London, Arabic script readers including Arabic, Persian, Kurdish and Afghan people who have ethnic and cultural differences, become a united community in bi-scriptual Latin and Arabic scripts.

According to Boutros, the co-existence of English and Arabic in Arabic countries does not imply westernisation of Arabic people. Instead it creates a new 'cultural identity' (p20). This new identity has emerged as people welcomed Western influence and absorbed what was compatible and what was not. This started a new 'traditionalism globalised' or 'globalisation traditionalised' (p19)[71] cultural identity.

However, he argues that, since the structures of Latin and Arabic developed individually without considering the needs of simultaneous co-existence, Arabic script is subjected to a new system of typographic manipulation to adapt to bilingual global design expectations and trends (2017).

This section provides more insights on applying principles than those above, as it called specifically for harmonisation through considering the overall grey texture of the layout. However more analysis is needed to elaborate a definition of harmonisation and other issues that may encourage this approach. For instance, previous sections in the review have shed light on the importance of equality and integrity without relating these to

[70] Wei and Moyer's (2004) research on the cross-cultural and international dimensions of cultural identities through multilingual contexts revealed that typographic and design elements are not the only issues to consider for creating a bilingual typographic layout, but that it must go beyond and consider the readers' linguistic skills. Readers of a bilingual layout may themselves be bilingual. For them, switching between languages or the process of identifying relevant language is different compared with a monolingual reader, which influences the readers' engagement with the typographic layout and their reading experience. Larissa Aronin and Britta Hufeisen (2009) in their book investigated 'undreamt-of linguistic scenarios' (27) to identify variety of language forms used by young generations who have a more relaxed attitude towards the use of 'code-mixing' in visual languages. They pointed out that the typographic bilingual/multilingual approaches in graphic and web design is causing 'unfocused language acquisition' (27), which results in unexpected verbal code mixing for third generations who are readers of the bilingual typographic layouts. This again revealed another issue to consider for designing a bilingual layout: that a knowledge of linguistics is becoming an inseparable part of typography. Walker (2001) supports this argument, as her book *Typography and Language in everyday life* discusses how the growth of globalisation and multiculturalism links linguistics to typography more than ever. Florian Coulmas (1989) claims language is part of our culture. Understanding different linguistic attachments to a language helps us to gain better understanding of the relevant culture.

[71] These terms first used by authors of *Globalisation and* the *Gulf* (Fox et al., 2006)

harmonisation. But I believe equality and integrity play the same role as balance in grey texture of the layout, since all improve the user's reading experience and improve the design quality.

Although previously (and to some extent in this section) there has been an emphasis on inclusivity, we see here that paying respect to the culture of the scripts plays a key role in the success of a bi-scriptual design. This again shows that the need for inclusivity may not be suitable in every case, since the context will define whether there is a need for inclusivity (or not).

2.2.7. Design Practice

Between 2008 and 2010, the Khatt Foundation, owned by Huda Smitshuijen AbiFarès, initiated a project called *Typographic Matchmaking in the City*, in which five teams of fifteen type designers, architects and urban planners proposed new ways of integrating harmonious 'dual-script typefaces' (p148) and lettering for the built environment. They experimented with form, material[72], usability and ease of reading to address the needs of contemporary bilingual typography in urban spaces in the Arab World and for new media applications. A new bi-scriptual 3D typeface was proposed, marrying Latin and Arabic cultures to adapt to new technological restrictions, such as mixing uppercase and lowercase Latin glyphs (due to the lack of uppercase style in Arabic) and removing ascender parts of

[72] As a consideration in a bilingual layout, Ben Wittner, one of the founders and owners of graphic design studio Eps51, emphasised that designers decide on the grids and visualise the ideas behind the content depends on the 'material (print or digital)'. Printed or digital material affect the designer's decision about the grids, text articulation and arranging the hierarchy of information (Wittner et al., 2020) [1]. Wittner et al.'s observation about the material either including 'Print' or 'Digital',

Rutley (1972) in analysing the effect of bilingual English/Welsh road signs on the road accidents in Wales demonstrates the effect of materials on designers' decision about typography choices because of economic issues. For example, he discussed that the appropriate size for road signs is 4 inch. It costs 200 times more and is £175. If the sign is made bilingual, the cost will range between £325 and £315. This economic aspect of work demonstrates that financial issues affect designer's decision about the implementation of a specific typographic solution (Rutley, 1972). My experience as graphic designer in direct communication with customers shows that the cost of printing materials plays important role in customer's decision about choose of material for a brand. Noble and Bestley (2005) comments, the printing material is part of each business branding.

For instance, the texture of papers influences visual outcome of printed texts. As small font of serif typefaces with tiny strokes, and lightweight of sans-serif typeface are not appropriate for printing on textured papers.

[1] According to him, "Printed pages have defined proportion/spaces, whereas online pages and new media have a more elastic and scalable frame. The first implies a linear and slower reading pace of long texts, whereas the latter often involves the faster reading of shorter texts."

Arabic letterforms to make it more geometric and harmonious with 'industrialized Latin'[73] in LCD displays.

Their method of Arabic script simplification aimed to achieve 'Harmonization' with juxtaposed Latin scripts in lettering systems and, to adapt to new technology for urban presentation. According to Randa Abdel Baki, it was a successful approach, since it managed to synchronize the Arabic and Latin script despite the difference in length and shape. Baki (2013b:9) commented on AbiFarès' approach, saying it 'brought together Latin and Arabic typefaces in a generic and practical manner disregarding the complexity of Arabic calligraphy, and following primarily Latin script guidelines, such as using a single baseline and an x height. Arabic becomes Latinized'. Abifarès' approach is to bring Latin closer to the calligraphic style of Arabic in the Nugat project, and vice versa, to bring Arabic closer to industrialised Latin in the Story-Line[74] project.

AbiFarés identifies which contexts require the different typographic treatments (2015:262):

> "in Latin typography, the letter's design primarily determines the visual impression of a text, while with Arabic script, the letter combinations (which can be almost endless) determine the overall look and meaning of a text. The Arab typographer does not focus on the letter but on the word-image – the song – for him/her, it is not the details but the whole that counts. In Latin script, word and letter spacing is adjusted to justify text in a column. For Arabic script, this is not possible, because the script is connected, so a different method of justification, Kashida (or Semitic justification), is used. This is achieved by stretching the horizontal strokes of certain characters (or inserting short horizontal strokes, Kashidas, between letters) at chosen points in the word."

The two projects' outcomes in *Typographic Matchmaking in the City*, were specific to the experimental context, and the readability of the typefaces was not a priority.

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[73] In this approach (AbiFarès, 2010:148), they assigned one glyph per Arabic letterform, which is in contrast with Arabic cursive characteristics. Despite Arabic letterforms' nature, they dedicate no initial, medial, final or isolated form for Arabic. This Latinisation approach makes Arabic visually more similar to Latin.

[74] In the Story-Line project, designers played with material and forms to see how the form and shape of Latin and Arabic letterforms could adapt to a material.

In 2007 AbiFarés wrote, *Typographic Matchmaking* offers a guideline for 'matchmaking' Latin and Arabic typefaces. She proposed a developed anatomy of Arabic letterforms with nomenclatures in Latin and Arabic languages. However, her proposed anatomy requires extension, since some anatomies tend to break down into smaller components. As Nemeth (2006) argues, the structure of the strokes determines the weight of the text in a sentence. Therefore, if the strokes' shapes break down into the smallest components possible, as Latin anatomy does, designers have greater opportunity to manipulate the anatomy and consequently the weight of the text.

Rjeily (2011), wrote a book called *Cultural Connectives* to make Arabic easier to learn for those familiar with Latin script. The method is to improve learners' understanding of the basic characteristics of the Arabic alphabet by comparing it with Latin through creating a new bi-scriptual Latin-Arabic typeface, 'Mirsaal'[75]. She attempts to bring the typographic styles of Arabic closer to Latin by detaching the letterforms from their traditional calligraphic attachments to bring them closer to Latin. This detachment assists development of the language and leaves room open for experimentation. My analysis of the Mirsaal font with detached letterforms shows the letterforms remained legible when sitting in a line. However, the use of the same anatomy for all positions of an Arabic letterform militates against readability (Figure 1).

[75] It was influenced by 'Unified Arabic' designed by the Lebanese architect and typographer Nasri Khattar in 1947 as a proposal to the academy of Arabic Language in Cairo. The typeface included 32 characters with the aim of easing the learning and writing of the script by reducing the number of letter shapes. The typeface was heavily inspired by Latin typography. Unified Arabic was later developed and reshaped into 'Basic Arabic' in the 1990s by Mourad and Arlette Boutros as a commission for Cecil Hourani.



Figure 1. Mirsaal Typeface. © Rjeily (2011), *Cultural Connectives*, pp 58-59. Arabic script letterforms remained detached. Although the letterforms are legible readability is diminished.

The typographer Caram Kapp (2011), investigated the Arab language, culture and branding in the graphic design and typography layouts in the Middle East, by interviewing eight students, including beginners, who had not yet visited an Arab country, and advanced learners, who had spent a minimum of three months in an Arabic-speaking country. All were aged between 20 and 24. In the section devoted to the practice of bi-scriptual typeface design, he reveals that a lack of supporting tools results in inappropriate line spacing and font in bilingual websites. He argues it is necessary that designers keep up-to-date with the development of technology in supporting tools adapted to both Latin and Arabic scripts, and proposed some 'cheats' in harmonising Arabic better with Latin such as, "using larger font size and wider line spacing for the Arabic" (2011:62).

Stuttard (2012) interviewed graphic designer Březina of Rosetta Type. They discussed appropriate matchmaking and the growth of technology and its effect on alteration of some scripts for the practice of bi-scriptual type design. She comments that it is not about 'matching', but more about visually complementing, balancing and making the two fonts work on an equal level.

In his blog, Březina (2012) discusses issues in multilingual type design. He writes that typographers face challenges at the crossroads of linguistics, typography and computer science. He commented, "sensitivity is a prerequisite for good multi-script designers. And not only type designers, but also typographers and graphic designers. One should never take

for granted that what works in one script will be applicable and equally effective in another."

2.2.7.a. Tourism

Maag[76] (2012) observed that giving similar respect to Arabic script in juxtaposition to Latin becomes necessary as culture-sharing opportunities increase with the growth of tourism. In collaboration with the Transport Design Consultancy (TDC), the Dalton Maag design agency worked on branding for the Dubai Metro. Maag identified a common problem with dual Latin-Arabic language systems, which is that "Latin script sets the tone": the Arabic script takes on a secondary role, which undervalues Arabic's visual and cultural heritage. The disrespect to Arabic prioritises Western elements in the region and disregards the priority of the local language and the first language of the majority of readers, which is Arabic.

2.2.7.b. Contextual Research

Balius (2013a) conducted practice-based PhD research and, in doing so, created a bi-scriptual Arabic and Latin typeface, called *Pradell Al-Andalus*, for use in multicultural environments for continuous reading in a Western context, such as in Spain[77]. According to him, "The commitment to multiculturalism by type designers is quite new, if we take into account that discussions on multilingualism and multi-script fonts have occurred in the last decade, […] most concerns are basically focused on a few forums and universities" (p41); and "the matchmaking for both Latin and Arabic is really discordant" (p121). Balius, after a comprehensive literature review on the available multi-scripts Latin and Arabic fonts[78] (2013:83), concludes that "only in a very few cases have the Latin and the Arabic font been designed hand-in-hand as a real multi-script font. In many cases some basic Latin characters have been included within the Arabic font set without taking much care over the harmonization of both scripts." According to his analysis, maintaining the proportion and

[76] Designer, Dalton Maag (2012), as Dalton's director, designed the bi-script typeface for the Dubai Metro.
[77] In Balius's opinion, punchcutters imitate the shape of Arabic alphabets without having any knowledge or bringing a new approach to the Arabic typeface design. Balius sheds light on the history of Arabic Type and available type specimens in Spain, distinguishes between calligraphy and typography, an outline of Arabic calligraphic styles, simplification of Arabic and its adaptation of Arabic to printing. He also presented reasons for late printing in Arabic and the shortage of Arabic typeface Libraries compared with Latin typeface Libraries. He also analysed Arabic history and characteristics separately from the features of Latin-Spanish script, without comparing the two scripts.
[78] To review the full literature review, please refer to Balius (2013:83-89).

structure of each script assists in legibility and cultural idiosyncrasy. Balius adds guidelines for creating the *Pradell Al-Andalus* with a more calligraphic look.

Balius (2013b) also published an article on the value of typography in the global multilingual world and emphasised the role knowledge of technology plays in achieving appropriate bi-scriptual designs. He writes that technological knowledge should combine with cultural and linguistic knowledge, considering that technology defines both the limitations and the possibilities of the resulting shapes.

At a presentation for the Typoday 2013 conference called *Coupling Bilingual Typefaces*, Baki[79] (2013b) presented the work of graphic design students at the Lebanese American University to design a hybrid bilingual typeface for bilingual display layouts. According to her analysis, four issues can be identified as responsible for the lack of well-designed display layouts, including 'mismatch of scripts' (2013:4), "treatment of Latin script as primary and Arabic script as secondary" (2013:5), 'scripts of same weight' (2013:6) and 'customized bi-scripts' (2013:7). She proposed customisation as a successful solution, since it provides equal balance and visual quality for both scripts. Baki concludes (2013b:8) that the two juxtaposed scripts on display layouts should 'hold similar characteristics', while 'enhancing the brand's visual identity' (p8). She offers six systems to achieve a 'balanced treatment' or 'well-balanced layout' in the juxtaposition of Latin and Arabic typefaces.[80]

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[79] Randa Abdel Baki, assistant professor at Graphic Design Department School of Architecture and Design at the Lebanese American University

[80] She considered the readers' linguistic skills should be sufficient for reading both languages; therefore, she believed the visual harmony of the dual layout should make both languages easily readable for bilingual readers. In contrast to her talk on bi-scriptual display layouts, this article focused on typographic contexts in which Latin and Arabic sit independently in separated blocks of texts, such as in posters. Her approach was influenced by Kimberly Elam's Typographic systems, focused on new bilingual layouts based on the horizontal and vertical axis with the aim to explore the bilingual layout beyond the traditional grids.

She proposed six systems for juxtaposing Latin and Arabic blocks of texts on a layout, including: 'bilingual axial system', 'bilingual mirroring system', 'bilateral system', 'interlacing system', 'complementary system' and 'random system' (40-42). Baki proposed to achieve a 'harmonious' bilingual layout, taking into account the dominant audience, locality of the information, the direction of the reading script and the hierarchy of the text to determine the appropriate typographic system or mixture of the systems.

Baki (2013:39): "Parallelism, in the context of a globalized Arab world, becomes particularly important as the governing principle should be that the local language is held in the same esteem as English, not as a subservient second, echoing colonial relationships between the West and the Middle East."

As stated by Baki (2013:4): "while assessing the relationship between the scripts of two languages, it is crucial to consider the specific elements that contribute to our innate visual preferences."

Baki's 'bilingual axial system' is appropriate for situations where each script, Arabic and Latin, lays 'on the side of a vertical or horizontal axis', while her 'bilateral system' is a 'symmetrical structure' where both scripts are centred 'on the same single axis'. According to the layout treatment or the function of the texts, she proposed a few contexts that the bilingual system could fit. For instance, the 'bilingual mirroring system' is appropriate in a book or brochure where the text

Research by Almusallam (2014) reveals the lack of training and appropriate typographic resources for working with Arabic script. Baki (2013a) similarly argued there was "a lack of training in creating harmonious bilingual layout" (2013a:39).

Dhawi's PhD thesis (2017), titled *Redesigning Arabic Learning Books: an exploration of the role of graphic communication and typography as visual pedagogic tools in Arabic-Latin bilingual design*, identified that poor-quality design bilingual Arabic and Latin learning textbooks discourage Arabic students from learning. He believes the graphic design and typographic issues are driven by 'inexperienced instructors in information design', 'restricted and poor choice of Arabic Typefaces' and 'restricted choice of illustrations' (p75). Dhawi comments on the lack of Arabic 'educational typefaces' (p19), whereas Latin script societies do consider the learning requirements in Latin typeface designs. For example, as demonstrated by Luz Rello and Recardo Baeza (in Dhawi 2017:19), Helvetica, Courier, Arial, Verdana and Computer Modern Unicode were designed to be accessible for people with dyslexia. This has not yet been achieved for Arabic typefaces. As a result, Dhawi designed a simplified Educational Arabic typeface for an existing Latin typeface, to ease readability, writability and understanding of the complex Arabic script and language to be used in bilingual learning textbooks.

2.2.7.c. Optical Character Recognition

Jandi et al., (2014) provide guidance for creating bi-scriptual Latin and Arabic typefaces, to make Arabic and Latin texts regenerable for Optical Character Recognition systems (OCR). This approach helps to convert scanned bi-scriptual books or documents into editable and text searchable e-books. According to the authors, legibility and accuracy of text recognition has not been investigated from the perspective of digital font design. They propose a simplified guideline for Arabic script, 'Loop Height' and 'Tooth Height' instead of x-height, working for a bi-scriptual digital recognition system. Further investigations are needed to identify appropriateness of their system of Arabic guidelines for continuous reading in printed publications. They offered mathematical equations to calculate ratio proportion of

treatment for both languages is the same, but the texts are still separate. While she proposed for a poster design that one script faces the other, the bilingual axial system may be a better choice.

letterforms in Latin and Arabic based on parameters including x-height, ascenders and descenders, and on several other features, such as fixed and variable spacing, serif and sans serif. Although not all typefaces are used for OCR purposes, OCR facilitates digitisation of printed text, which may use any typefaces created for design purposes. Therefore, legibility of letterforms is no longer just an issue for print.

2.2.7.d. Other bi-scriptual challenges

Tam[81] (2017) proposed a descriptive framework as guidance to achieve harmonized Chinese-English bilingualism, specifically for the Hong Kong typographic context. His aim was to achieve 'coherent and accessible' (2017:41) design in multilingual documents. Describing 'harmony' as "making two elements visual equivalents of each other [which] highly depend on context" (2017:42), he divided bilingual typography into three different categories, namely: 'parallel', 'code-mixing' and 'code-switching'[82].
Tam also proposes a framework to outline the differences between the typographic attributes[83] of Chinese compared with Latin. 'Graphical attributes' are grouped into type style, scale and measurement, weight and density, typographic variants, typographic adornments and graphical devices. 'Spatial attributes' are grouped into spatial sequence, configuration, reading direction, alignment and spacing. His framework offers useful guidance for understanding different typographic typesetting requirements. Acknowledging these differences encourages designers to think about alternative solutions for a range of typographic situations. In 2020, Tam added 'matching weight' between Chinese and Latin typefaces stating: "When matching weights between Latin and Chinese typefaces, look for

[81] Keith Tam was born in Hong Kong and has lived in the UK and Canada. He is a Hong Kong-based information designer, typographer, teacher and researcher with a multicultural perspective.
[82] These terminologies are borrowed from the field of Linguistics. For more information on each terminology's connotation in linguistics, please refer to Li and Moyer (2008).
'Parallel' refers to the typographic layouts in which the two-language pair are presented as equivalent to each other; more appropriate for situations that demand 'equality' and 'cross referencing' (2017:41) between the two languages. Code-mixing refers to situations in which a fragment of the second language is seen within the dominant language, either due to necessity of presenting translation or the phonetic equivalent of a word or terminology. According to Tam, code-mixing preserves the cultural background or 'acts as emotional buffers' (2017:41). Code switching refers to situations in which entire sentences, paragraphs or clauses are integrated into the dominant language. Code switching requires the ability to read and understand both languages in order to understand the entire content.
[83] He used the terms 'global properties' and 'local properties' to group these attributes. According to Tam (2017:45) 'Global properties' refers to a class of attributes that articulate the overall status relationship between the two languages. "Local properties refers to the attributes that articulate the semantic structure of each individual language."

an approximate equivalence of overall density rather than an absolute match of stroke widths" (2020:210).[84]

Paek proposes guidelines for texts with both Hangul[85] and (by which he means Latin) scripts again with harmony (2014:6) with a multi-scripting environment in mind. He created a Hangul version for the existing Nanum Latin typeface. The different structure of the Hangul alphabet compared with Latin creates a lack of affordance when Roman guidelines apply to the Hangul alphabet[86], so Paek (2014:31) proposes guidelines for "the characteristics of the existing typeface, legibility, readability, balance, counterspace, harmony through the original shape, typographic anatomy, typographic voice, and usability."

2.2.7.e. Type Design

In 2015, Gary Leonidas chaired a type-design panel discussion: *Beyond Latin* with John Hudson, Neelakash Kshetrimayum, Kamal Mansour and Pascal Zoghbi to discuss the international status of 'non-Latin' type. The outcome was published in Eye magazine (Leonidas, 2015). It shed light on the versatility of non-Latin typeface design and changes in the profession, from designing mono-script typefaces with a limited variety of weights and widths most appropriate for 'display typeface' to designing 'type families'[87]. As the comments suggest, international publications and globalised brands had a major influence

[84] In the bilingual approach between Chinese and Latin scripts, Tam (2020:210) considered the importance of text extent, type size, weight and density in Hanzi and Latin script juxtaposition. He also pointed out that Henzi does not follow the Latin 'alignment references' baseline and x-height, suggesting to 'not try to force elements to align.'

[85] The structure of Hangul alphabets is very simple, consisting of dot, vertical and horizontal lines, and usually the sequence of letterforms accumulate in boxes. The Hangul alphabet, like Latin are disconnected within a word, however the order of letters could be variant from to left or right, or Lower to left or right. And interestingly Hangul like Latin has both Serif and Sanserif.

[86] He investigated the strict proportion ratio to make sure the letterforms of both scripts follow the same proportion. For example, C, D, G, O and Q fits in a square. A, H, K, N, T, U, V, X, Y and Z are ¾ of a square. and B, E, F, L, R, P and S are ½ of square. In this case, his chosen typeface Nanum Gothic's Roman (i.e. Latin) letterforms followed the same proportion. However, following the same proportion for both Hangul and Roman in Nanum, the Hangul type with its strong geometric appearance has manually to be reduced in size to avoid overpowering the Roman. But Hangul needs more leading compared with Latin to serve the readability and legibility of the scripts. The outcome of his research could be summarised thus:

When there is a variable width of strokes thin and thick, in smaller sizes the Hangul Nanum Myeongjo seems light because the counters seem wider. The bigger x-height of Nanum compared with the Roman, and the position of serifs above cap height, makes the Hangul texts bigger compared with Latin. The wide counter spaces in Nanum Gothic need optically kerning, rather than mathematically. Depending on the typeface, a different size adjustment, leading and tracking is required between the paired typefaces. To achieve a good balance between the foreground and background in Nanum Barun Gothic typeface, he believes a clean form of Sanserif makes a typeface more readable in smaller sizes. He assumed that Latin is more readable in smaller sizes because it has more clean serifs.

[87] The 'type family' refers to a typeface with variable scripts.

on these changes and developments, in addition to the technical support provided by Microsoft and Adobe.

Neelakash Kshetrimayum commented that the challenge to modernise the script lies beyond technical knowhow. Aesthetic excellence in Indian typefaces requires both 'designing in context' and 'placing in context', meaning "the typeface needs to be designed to a specific purpose, while having a unique voice" (2015:81). According to her, there is a shortage of Indian typefaces available in various weights and, since good designs are hard to find, designers end up using any typefaces available, resulting in disappointing results:

> "a thorough understanding of the roots of Latin and Devanagari scripts – the stroke movements, their stresses, etc. – makes it easier to make them work together. This does not necessarily mean that they should look the same, but rather, that the elements must complement each there and work in harmony. At the moment, many typefaces that extend across scripts show signs of Latin influencing the non-Latin scripts" (2015:84).

John Hudson, in the same publication, commented that there are parallel and similar criteria for all writing systems, but the criteria must be evaluated according to the specific script's characteristics, style and idioms. For example, he says designers must convey a 'feel' about when the proportions are right. Hence, for designing typefaces of every other script, the proportion between letterforms plays an important role, but it must not copy the proportional measurement of Latin script. Instead, it must be based on the graphical sign of that writing system, its style and idiom. It is necessary to understand the writing system of the script to achieve an excellent result (p83).

In analysing the *Ustani* typeface design developed by Giasson and Mansour in 2013, Leonidas (2015:82) writes "instead of the x-height, Arabic type involves small upstrokes, or 'teeth', […] the height of the teeth plays an important part in readability, by differentiating letters. In this example, tooth alternation with a change in the height of the tooth at the beginning of a new letter – makes the word easier to read".

Březina (2015) in *Rosetta Type Blog* writes about the advantages and restrictions that technology may provide relating to type design, providing case studies from Devanagari

type design, and how to achieve harmonization in designing a multi-script type family[88]. He proposes balancing basic parameters such as visual height and overall weight, and offers guidance for designers of bi-scriptual layouts. He further comments that 'intellectual humility' is an extremely important attitude for designers to have in order to acknowledge their 'not knowing and mistakes'. In his opinion, typographic development and innovation are impossible without true understanding of the reasons why something did not work well in practice. Sensitivity to cultures and contexts is a prerequisite for good multi-script designers. He argues that harmonization should not be excessive. Particularly, one should never take for granted that what works in one script will be applicable and equally effective in another.

Boutrus (2017) shares best practices for bi-scriptual logotype designs, conversions from Latin to Arabic and vice versa. In his view, converted logotype must perfectly balance style, weight and legibility, more than just fashion. He offers 'typographic hybrids' between Latin and Arabic by identifying similar anatomies between Latin and Arabic letterforms such as flip lowercase 'm' which could be used as 'س' in Arabic. He comments that 'tilting', 'twisting', 'rotating' and 'mirroring' Latin letterforms or strokes to create Arabic letterforms might benefit from similar weight, serifs and x-height, but serious adjustment is still needed to adjust the proportions and meet cultural sensitivities.[89] In his analysis of bi-scriptual logos he comments that Latinisation in the sense of using one ascender and one descender for Arabic letters might make it a successful approach. Again, it seems Latinisation worked for this specific context.

Wittner et al. (2020)[90] state that there is a lack of academic sources providing guidance for juxtaposing Latin and Arabic scripts. In their 2020 publication on typography and graphic design with multiple systems, they demonstrate that there is still a lack of Arabic type design for the needs of bilingualism. Captan and Sarkis in that same publication (2020:29) state "the practice of Arabic type design is still in its infancy, yet it is confronted with several

[88] Březina wrote a blog entitled *Considerations in multilingual type design*. This paper was first presented as 'Challenges in multilingual type design' at the ATypI Conference in Amsterdam 2013 and it is a continuation of an article with the same title published in Codes magazine, No. 2.

[89] He provided guidance on an unsuccessful approach in connecting Arabic middle-positioned letterforms with teeth to the final position 'ى', which mostly benefits practice of typeface design (For more information, please refer to Boutros (2017:70).

[90] Ben Wittner, Sacha Thomas, and Timm Hartmann.

challenges, including multiscript designs, type solutions that answer increasingly complex needs, adapting technology for use with the script, and a lack of grounding, research and education."[91]

In bilingual layouts that share the same script, the 'contrast' between the two languages has to be exaggerated in order to differentiate the languages and visually help readers to identify and read their relevant texts (2020:30). They argue for the potential social effect of good bilingual typographic layouts based on socio-cultural aspects of societies, such as potentially eliminating social gaps in India and having a positive influence on interpersonal conflicts between Jews and Arabs in Israel[92].

2.2.7.f. Urban multilingual, multi-scriptual contexts

Kaveh Waddell, an educator from the American University of Beirut published an article in 2017 about the chaotic and irrational mix of English, Arabic and French languages in typographic layouts in Beirut. According to him, the messy jumble of languages on written layouts – code-switching – makes it difficult for visitors to identify and pick up the relevant information, especially for those who are unfamiliar with this phenomenon. It makes readers uncertain about identifying relevant data. Commenting on the lack of rules for a mix of languages, Waddell (2017:Blog) states, "For visitors and locals alike, it can be hard to pin down just how they interact, and the unwritten rules for how they're used."

Angela Riechers[93] (2019) sheds light on the importance of acknowledging readers' cultural background in designing for Hebrew and Arabic (2019:28):

> "A native reader of a given script has an inherent eye for what looks 'right' and what is 'readable' and 'appropriate' […] There's a whole class of Arabic script styles that are practically impossible to render accurately in the

[91] They proposed the ACE engine layout as the leading technology explicitly designed for Arabic (which can also be applied to many east Asian scripts), offering a full range of user-friendly options. It is also mentioned that OpenType technology is not necessarily the most suitable for Arabic script (Captan and Sarkis, 2020:30).
Despite the rich history of research, investigated typography principles for working with individual scripts, including loads of available practices and discussions about the role of principles in guiding monolingual typographic approaches in different era and contexts for example 216 academic resources found in the course of this research about typography with Latin script – ; in the field of typography as Basma (2014) observed, there is no evidence of academic and professional source focus on bilingual topography, it's ruling principles and potential contexts.

[92] A full analysis of these socio-cultural issues is available in chapter 1, Section 1.1.2.

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> layout model used by OpenType because of the complexity of contextual spatial relationships involved […] Unlike Latin, Arabic cannot be written by drawing letters inside adjacent boxes."

Although this concerns the practice of typeface design, we must consider these difficulties' influence on the scarcity of available Arabic typefaces compared with Latin.
She discusses updating software and tools that support both Arabic and Latin scripts as necessary for designers and the importance of a designer's familiarity with the script, acknowledging details of anatomy for the success of a type design. She provides examples of how tiny mistakes in the anatomy of a letterform may result in misinterpretation. For instance, she writes 'in Hebrew, one tiny protrusion on the right makes 'נ' into a 'ב'. A leg that is slightly taller makes a 'ה' into a 'ח'. A slightly shorter descender makes a 'ד' into a 'ך'.

> "All designers can benefit from the unique learning opportunities encountered by multilingual type designers – for instance, by looking at their native writing systems more analytically as a matter of routine. Reflecting on design practice in multilingual contexts is not a luxury; it is a basic necessity in a field that so directly affects communication possibilities across the world" (Riechers, 2019:29).

Baur[94] et al. (2020) analyse city signs including city names in Chinese, Latin and sometimes French besides Chinese in parentheses. They comment (2020:66): "In the areas of visual and cultural studies, most research is carried out from the perspectives of art, cultural studies, or linguistics, but rarely communications design." They discuss the 'economic relationship of coexistence' (p29), describing 'economic' in its context as ''what is considered necessary is presented in both languages". In the design brief for bilingual street signs, they describe how 'I' intensifies the participants' mood. The typeface should allow participants to connect directly to the current Chinese reality, and challenges of translation are another main concern for this bi-scriptual project.
Baur published an article in 2011 describing projects he would present in his later publication in 2020. in this source he claimed (2011:2): "The presence of characters of

[94] Baur et al., in 2020 examined concrete design questions in social contexts, fundamentally oriented toward the development of an accountable design approach. He specializes in the design of public spaces and has developed internationally recognized projects with Intégral Ruedi Baur et Associés. He is a professor at the School of Art and Design, HEAD - Genève, the Ecole nationale supérieure des Arts Décoratifs, Paris (ENSAD) and the University of Strasbourg.

different cultural origins in a single medium is an issue that has not really been comprehensively explored yet."

In conclusion, equality is identified as an important principle in bi-scriptual typographic approaches, and the majority of discussions have focused on the role of strokes' proportions and weight in achieving equality. This shows the necessity of designers' familiarity with anatomy of letterforms and understanding of the role that each anatomy plays. Knowledge of anatomy of letterforms may seem more a concern of typeface designers, rather than designers who are consumers of the typefaces; however such knowledge could aid every designer in decision-making about the choice of appropriate typeface. To assist designers who deal with bi-scriptual Latin and Arabic typographic layouts, I analysed the anatomy of Latin and Arabic letterforms and their nomenclatures, of which full details are presented at Chapter 5.

In addition, the discussions on the role of strokes' proportion in achieving equality shows that, if the principles that play a role in success of design quality of juxtaposed Latin and Arabic were to be considered in the process of a typeface design, it could improve the design quality within the practice of arrangement of text. It shows the effect that bilingual design quality of a typeface has on overall design quality of juxtaposed texts. Consequently, it implies that the identified principles in this research will be of concern not just typographic designers who are consumers of typefaces and decide on the layout and arrangement of texts; but it must also be a concern of typeface designers who design for bilingual contexts.

Moreover, further analysis is needed to identify issues effecting equality in arrangement of text regardless of how the anatomy of letterforms is treated in the process of a typeface design.

2.3. Gaps in the Literature: Lack of Principles, Guidance and Training

The literature review shows that the sources which focus on the arrangement of texts in bi-scriptual publications comment on the poor-quality and inappropriate design of juxtaposed Latin and Arabic scripts in different typographic layers in cities, in publications and in bilingual learning and teaching contexts and logo designs (Walker, 2001; Baki, 2013b; AbiFarès, 2017[95]; Dhawi, 2017). The literature review demonstrates there is a lack of training for designers in working with Arabic script[96] in bi-scriptual publications, there is a lack of grounding research and education and a lack of type solutions that respond to the complex needs of bilingualism and bi-scriptualism. The literature review shows that the issue of coexistence has been under-researched from the typographic perspective. (Baki 2013b, Zoghbi, 2015; Baur et al., 2020; Wittner et al., 2020). Therefore, the field of bi-scriptual Latin and Arabic typography needs guidelines to assist designers in creating high-quality design.

The thematic chronological approach of the literature review helped to identify the matters of concern in history and a variety of contexts that were of concern to designers.; while the analysis of approaches and guidance it has identified shows that achieving an appropriate level of harmonization is a common issue for almost all sources that focus on the practice of typeface design or the arrangement of texts. Harmonization was the main concern for both those that focus on the coexistence of Latin and Arabic, and for those that focus on other sets of scripts. The literature review implies that by learning from the selected sources' outcome, defined and appropriate guidance or principles can be drawn for the practice of bi-scriptual Latin and Arabic typeface design in general (Papazian 2005; Nemeth 2006;

[95] The typographer and founder of Khatt Foundation, Huda AbiFarès, in her 2017 speech at typography conference, *Multiscript typography for a global citizenship*, University of Amsterdam, shared her experience of exploring urban bi-scriptual Latin and Arabic typographic layouts in the city of Cairo. According to her, the mixture of Arabic and Latin scripts on the bi-scriptual road signs in the city of Cairo 'looks messy' due to inappropriate typographic decisions made for the Arabic script on the signs (AbiFarès, 2017).

[96] Analysis of resources focused on monolingual typography working in Latin script or Arabic script shows the guidance and principles identified working with Latin script has now well established and documented, having been thoroughly explored from a print perspective over the last century by a wide range of designers, practitioners, historians, and educators. But the principles for working with Arabic script remain collective. This makes it more challenging to develop guidance/ principles that guide bi-scriptual Latin and Arabic practices when there are undefined principles for Arabic typography.

Boutros 2009; Kapp, 2011; Březina 2012; Baki 2013b; Chahine, 2014; Jandi et al., 2014), including cultural concerns (Balius 2013b). Additionally, unique guidance was proposed for creating harmonious Latin and Arabic typefaces for specific contexts such as urban environments (AbiFarès, 2008; 2010), educational learning and teaching contexts (Rjeil, 2011; Dhawi 2017), creating harmonious new letters for the context of logo design (Gassas 2016; Boutros 2017) and display presentation (Baki 2013a). Although the review shows that guidance for typeface design exists, it does not benefit from accumulating the guidance offered by different sources. As AbiFarès (2010) writes, such guidance is not gathered together, so a designer must do the hard work of assembling the information herself, which results in each Arabic type designer having her own individual approach (AbiFarès 2001; Kheira, 2019)[97]. This lack of data accumulated in one place results in an undefined approach for achieving harmonious layout among designers. This encourages designers and practitioners to decide about a typographic solution either according to their own experiences or relying on available less than comprehensive resources.[98] The field needs a set of defined guidance to sustain success in design quality of bi-scriptual Latin and Arabic typographic layout. As the literature review shows, the few sources that offer common typographic advice for bi-scriptual layouts refer to a harmonious approach as an approach distinguished from matchmaking; however, there is still a lack of definition and clarification as to how these two approaches are different and where each may be applicable. The terms 'harmonization' and 'matchmaking' are used widely but too much is taken for granted in using the terms, leaving them with a lack of definition. It is only through the analysis of individual sources that it becomes possible to identify what is meant by harmonization or matchmaking. In his analysis of harmonization, Březina (interview with Wittner et al., 2020:17) states that "it seems to me that there are various notions in which people use the term visual harmonization – standardisation, uniformity, matchmaking, visual balance, etc."

[97] *As AbiFarès (2001:123), mentioned, "like much of today's knowledge type design and production has become collective knowledge, no longer gathered in one spot and in need of a variety of expertise to properly produce and reproduce it."*

[98] As AbiFarès (2001:17) pointed out: "Arab typographers are rare individuals, often working in isolation, and having little, if any, contact with each other. As a result, Arabic typography suffers from a general state of neglect and stagnation."

With regard to the practice of arrangement of texts, guidance has been proposed for the coexistence of Latin and Chinese texts in continuous texts, but the guidance only considers the relationship between Chinese and Latin in the context of continuous reading. The overall category on how Chinese and Latin coexist in this context may be applicable for other bi-scriptual layouts, such as Latin and Arabic, but the typographic solutions concern the characteristics specifically of Chinese script in comparison with Latin, which is very different from Arabic. The guidance is limited to issues regarding type characteristics and is not concerned with other issues identified in this literature review, such as culture, inclusivity and user experience. Therefore, this guidance needs expansion.
Influenced by Papazian (2005) and learning from the guidance proposed by Tam (2017), the level of achievement of harmony depends on the function of a type or the bilingual context. This research project is influenced by Tam and Papazian, but neither of these, nor any others investigated in this literature review, comment on different bilingual contexts for the arrangement of texts or how the level of equivalence may be different in each context. There is a lack of analysis of context for the field of bilingual typography that may need different typographic concerns to be taken into account for the arrangement of texts. Concerning guidance for the arrangement of dual texts in the juxtaposition of Latin and Arabic, Baki (2013a) provided guidance to achieve a well-balanced layout. But she only provided guidance for parallel layouts in continuous reading that had been recognised earlier by Tam. Her approach is not extensible to other categories of continuous reading, nor for other contexts.

2.4. Literature Review Conclusion

There is a gap in guidance regarding the arrangement of texts in bi-scriptual typographic layouts, specifically for the juxtaposition of Latin and Arabic. Influenced by Papazian (2005) and Tam (2017), this research project focuses on the need for high-quality bilingual design for harmonization, but its level will be different according to the context. Therefore, to demonstrate the role of principles in creating bi-scriptual layouts, analysis of context and categorisation is first needed to identify those that may need different typography

treatments. Furthermore, since there is a gap in defining a harmonization approach, guidelines are required to clarify established criteria and contextual needs. To respond to this requirement, this study first outlines a short history of principles and how they link together. Secondly, it seeks to learn from criteria and guidance identified in the literature from other practices and contexts, in order to identify those that have the potential for expansion for the arrangement of texts in bi-scriptual Latin and Arabic scripts in practice. This helps to define the criteria to achieve a harmonious level, define it and distinguish it from other approaches such as matchmaking.

As Gluth (2014), in their practice-led research into typography, concluded, “designers need to make sense of how these things interact with each other and change in a fluid way” (cited in Muratovski, 2006). There is “a need for a knowledge of the process – how to go about it rather than what to do – and the need to know how to find out what is needed and what can be done through the application of research.” A study by Dr. Hilary Kenna (2012) demonstrates the superiority of the practice-based approach in typography. This is also observed in bilingual typography approaches, since typography in some fields, such as bilingual typography, faces a lack of adequate research and documentation of facts, challenges, problems, solutions and principles, because designers are focused on the practical aspect, rather than theoretical research and documentation. This means the knowledge is held by individual practitioners and is not recorded by commentators or theorists.

2.5. Latinisation, a Practical Approach for a Real Customer

2.5.1. Latinisation (Critical Analysis)

As previous discussions show, Latinisation is one approach that has been proposed to the challenge in a number of texts. The purpose of this section is to demonstrate researchers' arguments on the effect of Latinisation on the Arabic script and analyse the advantages and disadvantages of Latinisation for a bilingual Latin and Arabic script layout. In addition, it sheds light on the effect of Latinisation in other scripts, such as Hangul and Greek, and investigates what could be learnt from this approach for designing Latin and Arabic bilingual layouts.

Typographers and type designers (Papazian, 2004; Nemeth, 2006; Baki, 2013; Azmi and Alsaiari's 2014; Captan and Sarkis, 2020) agree that use of Latinised typefaces is a 'flawed' approach for continuous reading since, first, it weakens the natural Arabic formation, which negatively affects the readability of the script in a smaller size; secondly, it diminishes the cultural integrity of the Arabic script.

Thus, in his critique of Arabic script Latinisation, a well-known and often-acclaimed Lebanese type designer, Hrant Papazian (2004), discussed the concept that achieving 'equal proportions' between Arabic and Latin script causes deterioration to the Arabic script's structure and integrity, which affects the readability of the script. Papazian (2004:15) states: "by replacing a script's traditional proportions with arbitrary ones inherited from the Latin master we weaken its natural formation of word shapes, the key to efficient reading."[99]

To meet the needs of parallelism and readability for bilingual Latin and Arabic layouts in a smaller size, type designer, Titus Nemeth (2006), who is a non-native reader of Arabic script,

[99] We must acknowledge the influence of Latin script in some proposals made in the quest to reform the Arabic language and script. But none of these extreme solutions has been accepted or implemented (Hunziker, 1985, cited in Nemeth 2006). However, nowadays, typography enters a new realm of Kinetic typography, and the shape of letterforms has been distorted and deformed.

proposed a different method or principles called 'Apparent Size'.[100]

The problem also lies in the fact that Latinisation imposes the Latin system of optical disparities on Arabic script without considering the difference between the anatomies of Arabic script and Latin. The graphic designer and educator, Timothy Samara (2004), argues that corrections towards the 'optical disparities' of Latin play a crucial role in improving Latin script readability. Minute changes in character height, shape, size of counters and stroke width, length and position must be made to first improve the legibility of an individual letterform, and secondly, if the letterforms sit together in a sentence, they create a uniform texture and grey value to achieve the highest level of readability (Samara, 2004)[101].

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[100] He focused on designing a Latin and Arabic typeface family for use in body-text. His proposed principle focuses on dividing typographic space for designing the letterforms. Nemeth's typographic space for Latin script typeface encompasses three areas: x-height, ascender space and descender space. However, his typographic space for Arabic script type design includes five areas, the two additional areas being a lower space below the x-height dedicated to the teeth height, and a different area above the descender line dedicated to dots and diacritics. Nemeth's apparent size problem is that the Arabic script achieves a smaller appearance than the Latin counterpart, mainly because the height of Arabic 'teeth' is lower than the x-height of the Latin script. Not all the Arabic letterforms sit on one descender line. For example, the letterform, ر, sits in a different descender line positioning above the main descender line. Therefore, although this issue of readability in smaller size would be resolved, it will not achieve parallelism.

Nemeth argued one way to resolve this issue is to apply the same Latin Cartesian space to Arabic scripts to achieve 'equal proportion.' This is the same Latinisation method used by AbiFarès (2010) and Baki (2013). However, Nemeth discussed assigning the same three Latin Cartesian space areas to Arabic script to reduce and equalise the gap between the baseline and the descender line for all Arabic letterforms. It means all Arabic letterforms' 'bowls' will align with the same descender line, which is not in favour of Arabic script's readability. This approach is, however, flawed. Nemeth's (2006:6) research into characteristics of Arabic letterforms in a body-text layout revealed: "Ascenders, descenders, and the counters, along with the letter's joining line, constitute inherent characteristics of the Arabic script." Arabic script consists of multiple descenders with variable shapes. Reforming the descender shape and approach typographic Metrix significantly affects the Arabic script's readability (Nemeth, 2006).

Latinisation brings all Arabic letterform's teeth with the same height equal to the x-height;' all 'dots,' or all 'stems' would align with the same 'alignment reference.' Besides, within Latinisation, the strokes of some final position Arabic letterforms that must touch the baseline would achieve x-height instead. Because the gap between the baseline and the descender line becomes smaller and bringing the strokes of the final position's Arabic letterforms up to the same x-height gives the descenders adequate space to fit in with the descender line.

As Baki (2013) agreed, alignment of all 'teeth,' all 'dots,' all 'bowls,' or all 'stems' and repositioning the starting point of the final positioned Arabic letterforms are not in favour of Arabic script's readability in small size or long text. Also, it distorts the Arabic letterforms and, in some cases, it leaves no space for Arabic dots, diacritics or vocalisations. Observations through the course of this research reveal that the different shape and height of descenders, ascenders, x-heights and, in some cases, baselines, plays a crucial role in the legibility of an Arabic letterform in different positions.

Considering Nemeth's proposed principle 'Apparent Size,' the opposite approach to applying the Arabic five areas of Cartesian space to Latin script for bilingual body-text would not solve the problem, as the strokes of Latin descenders are stretched, resulting in a giant counter and deformation of Latin descenders.

[101] For example, in the system of Latin typeface design, compensation towards the minute correction of optical disparities of letterforms affects the height and shape of uppercase letterforms of 'E' and 'O'. As follows, the horizontal middle stroke within the uppercase letterform 'E' is shorter than the horizontal upper and bottom strokes. Also, the bottom counter within 'E' is larger than the upper counter. In another case, the height of capital letterform 'O' is higher than cap height and lower than baseline. This achievement in the height of 'O' help readers to perceive the size of this letterform equal to juxtaposed Latin letterforms in a sentence.

Latin and Arabic share very different anatomies of letterforms. Therefore, the optical disparities are very different in Latin script compared with Arabic script. The literature shows a lack of the minutest concession towards the optical disparities of Arabic letterforms. Therefore, the issue of Arabic script's readability remains unresolved (Chahine, 2012). The problem is that Latinisation provides a lack of readability of Arabic script in body-text, because it imposes Latin optical disparities upon the Arabic. Therefore, because the anatomy of Arabic letterforms is different from the Latin script and needs a different system of optical disparities, but Latinisation applies the same system of Latin optical disparities to the Arabic script, through Latinisation, the Latin Script would remain readable, but the Arabic script faces readability problems. For example, Chahine (2012:47) discussed the idea that open counters reduce Arabic script readability, and Latinisation imposes open counters. In their analysis of Arabic script and the Latinisation trend for bilingual layouts, Lebanese Arabic-type designers Lara Captan and Kristyan Sarkis (2020), based in Amsterdam, commented that Latinisation 'oversimplifies' Arabic letterforms' shape. They take on a similar appearance and behaviour to the Latin script. This does not take the 'history' and 'characteristics' of Arabic script into account (Captan and Sarkis, 2020:30).

Despite Wittner et al., (2020) comment that a bilingual typography should represent both scripts' intellectual heritage, the Latinisation method disregards the historical heritage of Arabic letterform shapes. Latinisation changes the characteristics of Arabic letterforms, which according to Blankenship (2003:61) are "linear, musical, rhythmic, dynamic, decorative, individualistic, contemplative, mystical, and asymmetric", to totally different characteristics, adopting Latin's behaviour, which, as she describes, is "formal, impersonal, rigid, symmetrical, static, grey, geometric, vertical and mechanical". Therefore, a rhythmic, fluid and decorative Arabic script is changed to formal, rigid and symmetrical Arabic letterforms in Latinisation.

Latinisation is not only applied in juxtaposition of Arabic and Latin scripts. It also influences the bilingual layouts with foreign languages juxtaposed with Latin. The analysis of the effect

of Latinisation in other bilingual layouts, including Hangul [102] and Latin layouts, Greek[103] and Latin layouts and Devanagari and Latin layouts, Kanji and Latin layouts and Cyrillic and Latin[104] (Paek, 2014; Wittner et al., 2020) in some cases demonstrates the same concern that researchers of Latin and Arabic scripts have expressed. For example, an observation by the Korean type designer Paek (2014:6) and another by the Greek educator, lecturer and typographer Leonidas (in Wittner et al., 2020:135), show that the Latinisation approach to the typeface design of Hangul and Greek scripts is flawed, because it diminishes the foreign script's historical heritage, statements which correlate with the studies discussed above. Secondly, Latin's 'typographic rules' or 'reference of alignment' do not entirely fit the other script's characters.

The analysis of Latinisation applied to foreign scripts demonstrates there is much to be learnt from those studies for designing bilingual Latin and Arabic scripts. The independent typographer and type designer, Vaibhav Singh (2020), in his analysis of bilingual Devanagari and Latin observed that, while respecting each script's integrity, the angle of stress is especially important, since applying an opposite angle of stress to a script's letterforms negatively affects readability. As examples, Devanagari and Latin have opposite angles of stress. According to Singh (2020:108): "applying Latin stress to Devanagari, whether in high-

[102] Interestingly, some Hangul script's typographic features are similar to Arabic. Research by the typeface and Graphic designer Jeongmin Kwon in comparing Hangul and Latin script (in Wittner et al., 2020:170) demonstrates that in Hangul, different vowels join in one box to create a syllable. The shape of a consonant is drawn differently for each letter. "Where the space and the balance between the strokes depend on the structure of each letter." Because the completed Hangul design according to the space in the square unit, each initial consonant, vowel and the final consonant is drawn inside the square, changing the size and shape and creating a balance between them. This feature is similar to Arabic script, because in Arabic, each consonant's shape is different according to its position in the word. Also, creating balance and good texture in a paragraph depends on the letter's shape in the word. As with Arabic script, "The baseline, ascenders and descenders are very clear cut in Latin, whereas they are not as apparent – or do not exist – in Hangul." Furthermore, there is a lack of a median line. According to Kwon (in Wittner et al., 2020:170): "in the case of Latin script, the central part of the letters, excluding ascenders and descenders, is located between the x-height and the baseline, creating a median surface that makes it more natural to align the text horizontally. However, because Hangul is deigned in a square block, all the shapes with a letter were designed to fit into the square box, and there is no clear median surface as in the Latin alphabet." This is true with Arabic, since here is no x-height in the Arabic script.

Although Hangul does not have a median surface, some letterforms can be standardised to align with its Latin script. (Can we use the same method for Arabic?) For example, letters x and y have strong horizontal lines at the top and the bottom and can be fitted with the height of capital H in Latin.

[103] According to Leonidas (in Wittner et al., 2020:131): "Greek was the first typographic script that captures in printed form a connected, fluid script that addressed complex problems of type-making and types successfully. This quality of handwritten Greek set a standard that predates by decades any example from other complex scripts (not least Arabic, a usual reference point for connected typesetting)."

[104] Latinisation also happened in Cyrillic. As Yukechev (2020:68) states: "The Latinised form of Cyrillic had been traditional in Russia since the Petrine typographic reform nearly 300 years ago. Cyrillic type has developed in parallel to Latin, repeating virtually all the stages of its development."

contrast or low-contrast typefaces, only hinders readability by removing the emphasis from the area where the emphasis is expected – 'at the level of the letter as well as at the level of the overall texture.'" This is true also in bilingual Latin and Arabic script layouts. As AbiFarés, in her book *Arabic Typography* (2001), explained, the emphasis in Arabic type is on the horizontality and the connectivity of the letters. However, the stress in Latin type is on the verticality of the separated letters. Early Rustica Latin script used in the 4th century was like Arabic script, with the emphasis on horizontal strokes, but the current modified Latin scripts emphasise the vertical (Dixon, 2002).

Consequently, as Singh (2020) observed, applying the Latin stress on Arabic changes the stress point of the Arabic type and affects the readability of the Arabic script.

In addition, Azmi and Alsaiari's (2014) studies show that Latinisation of Arabic script may be culturally disrespectful. As typographers and graphic designers Wittner et al. (2020) observed in their analysis of typography and graphic design with multiple script systems, a multi-script typeface should establish cultural identity (Wittner, et al., 2020). Despite the recent approach in Latinisation that with local scripts similar to Arabic, the bilingual layouts follow the rules of western culture and Latin script, research by Kapp (2011:28) shows that a design view of a bilingual layout should adapt to the local taste related to the cultural trend of the society (Kapp, 2011). For example, typographic elements of a bilingual Latin and Arabic script layout in an Arabic society must follow the Arabic cultures with consideration for Arab audiences' local taste, rather than resembling the mood, tone, font size and colour of Western values (Kapp, 2011). Beyond the functional aspect, a writing system reflects cultural prestige (Haarmann, 1991).

Finally, as discussed earlier, different users, according to the various visual shapes of a language and the language itself, may have a different understanding of the same object. Nemeth (2006) notes that, when a non-native Arabic reader judges an Arabic typeface according to the Latin script's style, the analysis is rooted away from the point of understanding the native language. Therefore, Nemeth (2006:5) states that: "a true and original evolution of Arabic typography cannot be achieved by forcing ideas and values of the Latin model on it". Considering Coulmas's argument (1989:39) that: "writing [...] not

only maps but also imposes structure", the process of Latinisation attempts to intertwine two very different styles and structures of understanding perceptions into one system.
The above discussion shows that using the Latinisation approach (i.e. the use of Latinised typefaces) is a flawed approach for continuous reading. Nevertheless, research by Baki (2013a), in an analysis of bi-scriptual shop signs in Lebanon, welcomed the Latinisation approach for display layouts. She respects the needs of presenting a unique brand identity and the needs for similar visual characteristics in shop signs. She states Arabic typefaces created through Latinisation are only usable for large texts like 'titles' and 'display layouts', because Latinisation results in poor readability of Arabic script in a smaller size. AbiFarés's (2010) Latinisation approach for urban bi-scriptual design was successful. Kapp's (2011) comment on achieving visual maps following similar shapes, forms and textures of original logos is helpful. And finally, Boutros' (2013) proposed typographic hybrids welcome Latinisation.
The proposed 3D bi-script typefaces in 'Matchmaking in the City' (AbiFarés, 2010) achieved visual balance between Latin and Arabic letterforms through Latinisation. It results in matching appearances between the anatomy of Latin and Arabic letterforms and provides the same sizing system which results in equal proportions in body-size between the two scripts' characters. According to an analysis of bilingual typographic projects that applied Latinisation, such as the Latinisation of Arabic script (AbiFarés, 2010) and the Latinisation of Hangul script (Paek, 2014), Latinisation could be defined as applying Latin script 'guidelines'[105] to a foreign script; to achieve a visual map and equality between the juxtaposed scripts. Latinisation applies the same level of Latin script's 'base line,' 'x-height', 'ascent line', 'descent line' and 'body-size' for the foreign script[106]. The analysis of approaches in Typographic Matchmaking in the City shows that, through Latinisation, both Latin and Arabic script letterforms sit on the same baseline, following the same Latin metrics. Both scripts also achieve the exact distance between the baseline and the

[105] In the typographic anatomy of letterforms, 'guidelines' refer to the all horizontal lines used to define the 'baseline,' 'x-height,' 'ascent Line,' 'descent line' and 'body-size' of letterforms. In this article, the author uses the term 'metric' to refer to each horizontal line.
[106] A different system of 'guidelines' is used for creating Arabic typefaces compared to Latin scripts in practice. Arabic script depends on the chosen seven styles, including multiple 'descent lines', 'baselines' and 'ascent lines'. The Latin script includes just one 'baseline', 'ascent line' and 'descent line.' Considering these differences, the method of 'Latinisation' makes all the Arabic letterforms sit on one baseline and achieve the same descent and ascent line.

ascenders and descenders of letterforms; therefore, both scripts' letterforms achieve the same body-size. My observation also shows, as part of this project's Latinisation, both scripts' letterform strokes follow the same width and style, giving equal tone to each script's letterforms.

The analysis of typographic studies has focused either on bilingual Latin and Arabic scripts or mono-lingual Arabic script (Safadi,1980; Haralambous, 1998; AbiFarés, 2001; Nemeth, 2006; Chahine, 2012; Kapp, 2014; Azmi & Alsaiari, 2014; and Mesghali, 2015) and revealed that following the rules of Latin typography in bilingual Latin and Arabic scripts brings a historical advantage. It encourages type-designers of Arabic script to re-assess the anatomy and visual form of Arabic letterforms and to step away from the complex and ornamental traditional Arabic calligraphy style, which positively affects the simplification of Arabic matrices[107]: the letterforms settle on simpler typography matrices.

2.5.2. Case Study: Practical Approaches for Dijla and Bamanosh

As a solution, with regard to the aim of this document to assess and provide solutions for '*Simultaneous bi-script bilingual layout* in a static environment', this section presents a few samples of my approach in simultaneous bi-script logo design including Latin and Arabic scripts for London-Iranian customers. The designs were approved by the customers and the logos have been displayed on shop signs and on printing materials. For the design of these two 'Dijla' and 'Bamanoosh' logos, the names have a meaning in the Kurdish and Persian languages respectively and are presented phonetically in Latin. Both languages use Arabic script for their written materials.

The bi-script logo was designed for the Dijla restaurant (Figure 2). My client requested a typographic logo to present the 'دجله' name in Arabic and the corresponding phonetic form in Latin 'Dijla' simultaneously. It was important to present both Latin and Arabic scripts at the same level. It was also necessary to present the restaurant as original Kurdish, expert in providing Kurdish foods. Furthermore, the restaurant's customers include not only people

[107] For definition of Matrices, please refer to AP1.7.

with Kurdish backgrounds, but also foreign people with other cultural backgrounds resident in London. From the marketing point of view, it was essential to welcome both groups of customers at the same level.

Furthermore, 'دجله' literally refers to the Tigris and the Euphrates in Mesopotamia. Therefore, the proprietor wanted the logo to include the map of Iraq as a conceptual link to the original location.

My intention, as the designer, was to achieve a visual map using the Latin and the Arabic scripts from both aspects: first, presenting both Arabic and Latin script words at the same level, not one as a logo and the other as a sub-heading. Secondly, I wanted to achieve a high level of visual map by approaching the same shape, style and thickness of strokes between the Latin and the Arabic scripts.



Figure 2. Simultaneous bi-script logo design (Latin and Arabic scripts) for the Dijla restaurant in London. Copyright *©SK Graphic Design Limited – Sahar Khajeh (2017).*

For creating the logo, first a typeface for the Arabic script was selected. In this case, to create the bilingual Dijla logo, the Arabic typeface 'B Arshia' was chosen. Then the anatomy of the Arabic typefaces was broken into different parts and 'Dijla' was formed in Latin script. That is why the visual form of both Latin and Arabic scripts achieved a high level on the visual map. For example, as Figure 3 illustrates, the 'stem' of the letterform 'D' has been eliminated, and only the 'bowl' of the letterform 'D' has been used to present both the capital letter 'D' for the initial 'Dijla' in Latin and simultaneously present the 'د' as the initial letter of 'دجله' for the Arabic script.'

The whole character of the final position of the Arabic letterform 'ة' is used as the 'single-

storey' lowercase 'a'. Also, the letterforms 'I', 'j' and 'l' were all taken from the 'middle position' of the anatomy of the Arabic letterform 'ل'. Finally, the same style of dots has been used for both scripts.



Figure 3. In order to achieve a visual map between the Arabic and Latin letterforms, the anatomy of Arabic letterforms was borrowed to shape the Dijla in Latin script.© Sahar Khajeh (2017).

The same method was applied to the Bilingual 'Bamanosh' logo. However, this time first the Latin script 'American typewriter' typeface was selected. Then the anatomy of the typeface was broken down to create the word 'بامانوش' in Arabic script. There is a difference in the Bamanosh marketing approach compared with that chosen for Dijla. Bamanosh is an Iranian restaurant in the South of London and its focus is to attract customers with Iranian and Arabic cultural backgrounds. As these groups are great fans of grilled foods, it is important

to show that this restaurant is expert in serving very high-quality Persian food, specifically grilled kebabs. Therefore, my focus in the design was to present the Arabic script more prominently, to attract more Persian and Arabic people compared with people from different cultural backgrounds. Again, the main aim was to achieve a visual map using the Arabic and Latin letterforms. However this approach was more difficult compared with the Dijla logo, because the letterforms in the Arabic script of 'بامانوش' include 'teeth' like the final position of the letterforms 'sh' 'ش' and initial position of letterform 'B' 'ب'. In addition, the letterforms 'ش' and 'و' have descenders with different shapes, but none of the letterforms in the Latin counterpart 'bamanoosh' has descenders (Figure 4). In this case, the style and the shape of the chosen typeface plays a very important role in enabling the designer to find similarities between the anatomy of Latin and Arabic letterforms specifically for the letterforms applied.



Figure 4. Simultaneous bi-script logo design (Latin and Arabic scripts) for the Bamanosh restaurant in London. Copyright © *Sahar Khajeh (2020).*

In this case, the dot of the glyph 'با' is shared with the letterform 'o' in bamanosh. The stroke of the Arabic character 'با' has been taken from the Latin lowercase 'b'. The 'bowl' of the initial position of the Arabic letterform 'م' is the outlined style of the Latin letterform 'o'. The final position of Arabic letterform 'ا' has been taken from the stroke of Latin lowercase 'h'. The initial position of Arabic letterform 'ن' has been taken from the 'bowl' of Latin

lowercase ‘b’. The final position of the Arabic letterform ‘و’ is the vertical reverse position of Latin ‘double-storey’ lowercase ‘a’. Finally, the isolated position of the Arabic letterform ‘ش’ is the vertical reverse position of Latin lowercase ‘m’. Figure 5 visually represents the shared strokes between the Arabic and Latin scripts.



Figure 5. In order to achieve visual map between the Arabic and Latin letterforms, the anatomy of Latin letterforms was borrowed to shape a the ‘بامانوش’ in Arabic script. © Sahar Khajeh (2020).

In this special example the serifs of the Latin typeface play the role of ‘glyphs’ in Arabic script to link the letterforms together and make it cursive.

In both situations, the strokes have been chosen from the letterforms used within the logo. For example, all the Arabic letterforms for ‘بامانوش’ have been chosen from the letterforms of ‘bamanosh’, while ‘Dijla’ took the anatomy of the letterforms of ‘دجله’. In situations where the letterforms of the two scripts used in the logo could not be mapped, the designer can use the anatomy of any other letterforms written in the same typeface. Within a typeface design like ‘American Typewriter’, every other Latin letterform except ‘b’, ‘a’, ‘m’, ‘n’, ‘o’, ‘s’, and ‘h’ shares the same style, strokes and serifs. Therefore, borrowing their anatomy for the Arabic letterforms would provide the same style as the ‘bamanosh’ letterforms.

Chapter 3: Review of temporary practices

3.1. Introduction

Research in visual communication, graphic design and typography with Latin, shows a typographic layout's effect on an audience's experience and engagement, depending on the design quality[108]. The typographic elements in a composition must be selected in line with the layout's function, responding to the audiences' needs (Noble and Bestley, 2005).
The analysis of those needs in a bi-scriptual layout is more complex than for monolingual typography since, typically, two groups of audiences with totally different cultural backgrounds become readers of one layout; but it is not just about the readers' cultural background, but also about the culture of the language. Coulmas (1989) believes language is a symbol of culture. If readers of a language feel the message in their language has not been treated with respect, they may perceive their culture (which is part of their identity) is not welcomed. Similarly, Ross and Shaw (2012) in their analysis of the dispute between China and Korea about ownership of the first printed Sutra wood-block prints, commented (p16), "Printing, typography and script are often connected with national identity and cultural pride."
For an Arab resident and reader of bi-scriptual Latin and Arabic layouts, the Arabic text must receive an appropriate quality of typographic approach, equivalent to that of the juxtaposed Latin script. Differing quality may imply that Arabic readers are secondary, reinforcing a sense of otherness. For example, the bi-scriptual Latin and Arabic typographic approach on a road sign in Côte d'Ivoire (Figure 6), demonstrates an unequal approach towards Arabic and Latin typographic elements. The Arabic script readers' culture and identity is differentiated from Latin, since the Arabic characters are treated with inappropriate

[108] Please refer to Appendix 1, section AP1.14.

typographic rules and alignments, in contrast with the juxtaposed Latin texts.
The Latin has cleaner print outcomes and a better arrangement of letterforms in line with the appropriate height and consistent bold weight. However, the Arabic is hand-written with an inappropriate arrangement of Arabic characters (more information available in the caption to Figure 6). The design gives priority and superiority to the readers of Latin script; Arabic script readers remain secondary. In addition, the hierarchy presents the Latin script on top, and the use of a very different style for Arabic compared with the Latin affects the status of the Arabic, which receives a secondary role; therefore Arabic readers do not feel their culture and identity are respected as equal. It seems they are treated as foreigners or a minority.



Figure 6. Road sign in Côte d'Ivoire indicating a town's name in Arabic and Latin characters (Flickr). The Arabic script is treated with less consideration and respect than the juxtaposed word in the Latin script. This may be because the official language of the Ivory Coast is French, and Arabic is a minority, unofficial language. The Arabic letterforms do not sit on a baseline. Based on the Arabic typography system, the initial Arabic letterform 'س' should sit on the same baseline as the letterform 'ک' sits, so the 'teeth' achieve the x-height. Instead, in this example, it sits above the cap-height of letterform 'ک'. This approach places the two final positioned Arabic letterforms' 'ر', respectively in 'کر' and 'سر' on different baselines. Furthermore, there is an ambiguity about whether the last letter is the final-position Arabic letterform 'ل'; or is it the capital Latin letterform 'J'? Its colour and style are the same as the Arabic letterforms, and the position is close to the Arabic characters, making it part of the Arabic. However, the horizontal bar above the letterform's vertical stem makes it look like the capital Latin letterform 'J.' Therefore, it feels less time and consideration was given to designing and arranging the Arabic letterforms on the board than the Latin.

Unequal treatment, showing unequal typographic respect for Arabic script juxtaposed to Latin, is also apparent in the cover design of the Lebanese magazine (Figure 7, Right: cover). It is a bi-scriptual Latin and Arabic monthly publication *The Voice of the Community, Lebanon Times*, which includes articles in English and Arabic alongside advertisements for Lebanese-based businesses. Arabic culture and language are dominant in Lebanon, and all the businesses that advertise in the magazine are established and trade there. But the dominance of English content is evident in the majority of the magazine's advertisements. To respond to the Lebanese societies' dominant Arabic culture and welcome it, a few advertisements include a minimised short message in Arabic in small font size, mostly

positioned at the bottom of the layout (Figure 7). The analysis of bilingual typographic approaches in this magazine shows businesses that aim to demonstrate high-quality products and services use Latin typographic elements and consider them superior to Arabic. The data in Latin script have a better arrangement of elements in the layout and are typographically treated more appropriately than data in Arabic. This supports the contention in the literature review that designers' training in working with Latin script and lack of working with Arabic script monolingually or in juxtaposition to Latin, may empower their skills in creating high quality design in using Latin script, but it simultaneously lowers their confidence and skills in working with Arabic script in juxtaposition.[109]
Regardless of the cultural, political and typographic factors pushing this approach, the absence of, or minimised use of Arabic script in an Arabic country's advertising, especially in a bilingual magazine, devalues Arabic script and its readers' culture.

[109] The presence of high-quality products in these adverts is not due to use of Latin script as a symbol of the West. Rather, it is an appropriate design quality of the layout and professional arrangement of Latin elements on the monolingual layouts that impose high quality and improve audiences' trust and engagement. Various cultural, political and typographic factors influence this unexpected approach, in that some advertisements are monolingual, in Latin script in a bi-scriptual Latin and in an Arabic magazine in an Arabic-cultured country. The first assumption stems from the superiority of Latin script in Arabic-script users' minds. As discussed in an earlier chapter, using Latin script as an element of Western values may indicate higher quality and gain better trust among audiences (Said, 1995; Kapp, 2011; Sington, 2020).



Figure 7. *The voice of the community Lebanon Times*, a monthly bilingual Arabic-English magazine. Left: September 2023, No: 135, back of front page. Right: January 2022. No 115. p. 28. The superiority of Latin script in a bilingual magazine published in an Arabic culture society.

In the *Voice of the Community, Lebanon Times*, No:117, published in March 2022 (Figure 8, left-hand image), the Arabic script texts which are written and read from right to left, are positioned at the left side of the layout, while the Latin script which is written and read from left to right, has been centred, positioned at the right side of the layout.

The reading direction[110] determines the eye movement of the reader (Noble and Bestley 2005). For example, readers of Arabic script as part of their reading culture are used to seeing first the items positioned on the right side prior to the left side[111]. Therefore, the positioning of Arabic texts on the left side of the layout is contrary to the Arabic readers' reading culture. This approach positions Arabic as the secondary language. It is the same for Latin, since Latin is read from left to right. Latin readers see first the items on the left side of a layout prior to the right. The approach here, positioning Arabic texts on the left side of the

[110] Arabic is a 'bi-directional' script (AbiFarès, 2001). Letters are written and read from right to left, Arabic numbers from left to right.

[111] *My experience in graphic design and printing supports the fact that the different reading direction of Latin and Arabic script also influences graphic design approaches to books, folded flyers or magazine designs, since due to the different reading direction, Latin artworks are bound and open on the left side, while the Arabic artworks are bound and open from the right.*

layout, indicates, as Baki (2013) asserts, that the designer's decision about the typographic approach for Arabic content was based on the culture and typographic needs of Latin script. The different Arabic script typography guiding principles[112] and cultures compared with Latin were not acknowledged.



Figure 8. Bilingual advertisement in *Voice of the Community Lebanon Times*, January 2022. No 115. Left: Cover – Right: Advertisement, p. 6. These bilingual layouts do not follow any alignments; each message is presented on its own without linking to other elements on the page. Also, three different Arabic typefaces of different sizes are used in the right-hand advert, which do not follow typographic principles. Finally, different information is provided in each language. The reader must be capable of reading both languages to understand the full message. The design does not follow a grid.

Furthermore, some bilingual Latin and Arabic layouts in Lebanon pay no attention to the reading skill of the audience. Some might be capable of reading only one language. For example, the majority of bilingual Latin and Arabic articles and adverts in *Voice of the Community, Lebanon Times* present some data in Latin and some in Arabic, without any apparent rationale behind the choice of the script. For instance, in Figure 9, the title is presented in Latin, while the body text is in Arabic.

[112] *For a definition, please refer to Samara (2014).*



Figure 9. Bilingual article, *Voice of the Community 'Lebanon Times* January 2022. No 115. pp. 36-37, presents an article with the title in English 'What to know about Sikhism' without equivalent Arabic title ' در مورد آیین سیخ چه می دانید؟'. In contrast, the body text is only in Arabic script.

In addition, inconsistency in translation can be observed in a bilingual facing-page in the magazine (Figure 10). The title in English presents the name of the tree, followed by a description. However, the Arabic title excludes the first part. A different typographic approach was used for the Arabic text, compared with equivalent data in Latin. For instance, in Latin, the paragraph's title appears in bold, and the same colour as the following texts in black. Subsequent texts continue after the texts in bold. However, the equivalent Latin texts in bold in Arabic, are presented in a different colour (red), as a title on a separate line with a bullet point. This approach is perhaps due to the lack of appropriate bold weight of Arabic in the chosen typeface. The bold text in Latin is visually distinguished from the regular texts, but bold Arabic may not be that distinguishable. The different approach for the same text in the juxtaposed Latin and Arabic scripts is contrary to equality. Additionally, the numerals in the Arabic text, such as the numbers 8 and 10 in the last paragraph, are present in Latin, which may be due to the lack of typeface support in Arabic numerals. Finally, the superiority of Arabic font size over Latin and an abundance of typographic rivers is due to a justified approach for paragraphs, apparent in this example.



The Manchineel Tree: The Deadliest Apple from Florida to the Caribbean!

It is the most dangerous tree in the world, bearing the fruit of death. Where can it be found? If you come across it, admire it from afar, and beware of its apple! It is known as the 'Manchineel Tree' or the deadliest tree in the world. It is found along sandy shores in tropical climates, stretching from Florida in the United States to the Caribbean Sea and parts of Central and South America.

This tree can cause severe harm to anyone who approaches it, as reported by the global website Atlas Obscura. It has been classified as the deadliest tree in the world according to the Guinness World Records.

The fruit, similar in appearance to an apple and called 'manzanilla,' contains toxins in every part of it, whether in the fruit, trunk, or leaves. The Spanish named it 'la manzanilla de la muerte,' meaning 'little apple of death' in English.

While the ominous name might seem dramatic, native inhabitants of the Americas used its toxins to coat their arrowheads and contaminate water supplies against Spanish invaders.

Avoid touching the tree's leaves!

Merely touching the leaves, even briefly or using the tree as a natural umbrella during a rainy storm, can cause skin blisters. Therefore, it's advised to stay away from it and avoid touching it.

How to identify this tree: The glossy leaves measure 5 to 10 centimeters in length and 2 to 8 centimeters in width, with colors ranging from yellow to reddish-brown.

Local authorities in the countries where this tree grows mark it with a red sign to prevent people from approaching it.

Remember, dear reader, this tree is dangerous despite its role in purifying the air, providing shade, and bearing apple-like fruit. Admire it from afar, but be cautious!"

29 Lebanon Times

تفاحة الموت من فلوريدا الى الكاريبي!

إنها أخطر شجرة في العالم تحمل تفاحة الموت.. أين توجد؟ وإذا صادفتها فليكن إعجابك بها من بعيد لبعيد.. وإياك الإقتراب منها و لا تغرك تفاحتها!

"إنها شجرة المانشينيل" أو أخطر شجرة في العالم.. فهي متواجدة على طول الشواطئ الرملية في المناخات الإستوائية للمعتدة من "فلوريدا في الولايات المتحدة الأميركية وصولا الى منطقة البحر الكاريبي" وصولا الى أجزاء من أميركا الوسطى الجنوبية.

وهذه الشجرة يمكن أن تتسبب بأذى بالغ لكل من يقترب منها بحسب ما نشر في موقع Atlas Obscura العالمي وتم تصنيفها كأخطر شجرة في العالم حسب كتاب "غينيس للأرقام القياسية".

• أخطر شجرة في العالم!

تحتوي الثمرة الشبيهة بالتفاح و المسماة "مانشينيل" سموما في كل جزء منها سواء في الثمر او الجذع او الأوراق.

وأطلق عليها الإسبان اسم "la manzanilla de la muerte" والذي يعني بالعربية "تفاحة الموت الصغيرة" بالإسبانية.

قد يبدو الإسم المشؤوم دراميا لكن السكان الأصليين في أميركا إستخدموا سمومها لوضعها في رؤوس سهامهم وتلويث إمدادات المياه للغزاة الإسبان.

• تجنب لمس أوراق الشجرة!

إن مجرد لمس الأوراق ولو لفترة وجيزة او إستخدام الشجرة كمظلة طبيعية أثناء عاصفة ممطرة تسبب تقرحات بالجلد.. لذا ينصح بالإبتعاد عنها وعدم لمسها..

• كيف تتعرف على هذه الشجرة؟

يتراوح طول الأوراق اللامعة من 5 الى 10 سنتيمترا وعرضها من 2 الى 8 سنتيمترا ولون الأوراق هو بين أصفر وبني محمر..

تضع السلطات المحلية في الدول التي تنمو فيها هذه الشجرة علامة حمراء عليها كي لا يقترب منها أحد.

فسجل عندك أيها القارئ إن هذه الشجرة خطيرة رغم إنها تساعد في تنقية الهواء وتوفر الظل وتثمر فاكهة التفاح.. لكن إنتبه فليكن إعجابك بها من بعيد!

28 Lebanon Times

Figure 10. Bilingual facing page *Voice of the Community Lebanon Times* September 2023. No 135. pp. 20-21. Inconsistency in the translation of the title. A different approach for the subheading in Arabic compared with the Latin. Use of Latin numerals in Arabic text.

My analysis of several bi-scriptual Latin and Arabic typographic city signs in Lebanon, found online in Alamy Stock Photo[113] (Figure 11), demonstrates inconsistency in the juxtaposed scripts' tone. There is a lack of a unified typeface style used for the juxtaposed Latin and Arabic scripts. In addition, there are different typefaces one script. The hierarchy of data does not aid audiences in identifying and reading relevant information promptly. There is a lack of alignment between the type elements on a layout. Furthermore, in the same phenomenon as observed in the bilingual Lebanon magazine, the mixture of typeface styles used in these Cairo bi-scriptual city signs is disadvantageous to monolingual readers[114] (Figures 12 and 13).

[113] Accessed Link 'https://www.alamy.com/'. Accessed date: March 2022.

[114] For definition of 'monolingual readers' please refer to Appendix 1, Section AP1.2a.



Figure 11. Alamy Stock Photo, Contributor: Julio Etchart, 19 April 2010. Lebanon. Old House in downtown Beirut, with bilingual French Arabic signs. The Arabic and Latin letterforms juxtaposed on each sign present different styles. Also, looking at the three signs together, there is inconsistency in the styles of typefaces. The data arrangement does not help the reader identify the relevant information promptly.



Figure 12. Cairo - Egypt - October 5, 2020: Signpost, Old Churches district, in Arabic and English. Religious attractions street sign. Coptic Cairo district. Photo taken by Viktoriya Fivko on 3 October 2020. Copyright @ Alamy Stock Photo. The text in Arabic seems secondary, due to the lower height of the Arabic letterforms compared with the juxtaposed Latin. Latin and Arabic are presented in different styles.



Figure 13. Bi-scriptual Latin and Arabic sign. Café at Talaat Harb Street, Cairo. Photo taken by Ivan Vdovin on 7 February 2007. Copyright@ Alamy Stock Photo. The logo in Arabic ‘ ’نيواريزونا demonstrates a very different identity and style compared with the name in Latin. A mapped typeface is used for the logo presented in Latin with one of the Arabic texts, but the rest of the Arabic messages are presented with a very different typeface. There is no relationship between the logo in English and the word in Arabic that is presented with the same typeface as the logo. There is inconsistency in the typeface styles used for the same script. In addition, there is a lack of alignment and hierarchy of information. Some messages are presented only in Arabic, with no translation in English.

Visual analysis above provides clear evidence in practice of what was identified theoretically in the literature review, i.e. the bi-scriptual Latin and Arabic scripts have poor design quality. Boutros (2009:27), in an analysis of website pages in Arabic, commented that poor quality design is dangerous, since "visitors are getting used to this poor design, accepting it as the norm."

Digital graphic designers Simmonds and Reynolds, in their article about principles of typography in the digital environment, discussed the effect of a 'badly designed' typographic layout. They argued that if the audience requires the information and has no choice but to read the data, 'bad design' will take the audience longer than usual to extract what they need. This phenomenon could result in misunderstanding the data or a lack of audience engagement with the typographic layout (Simmonds and Reynolds, 1989:31). The design of a typographic layout must improve memorability (Noble, 2012), but a bad design layout will not help. Finally and most importantly, as discussed in previous sections, a poor design approach for a language in a bilingual typographic layout would not be welcoming to the culture of that language's readers; and would give them a sense that their identity has been treated as secondary compared to the readers of the juxtaposed language.

Consequently, appropriate design quality is an important objective in bi-scriptual Latin and Arabic designs. According to Baur et al. (2020:245): "Graphic communication design can enhance the quality of the content, and reduce the difficulty in understanding a concept through complex texts. […] A good quality typographic design can demonstrate any complex content clearly via good decisions about the layout, typeface […]." Thus the design quality of the layout plays a key role in engaging and respecting audiences, improving their trust and improving the effectiveness of the influence on socio-cultural aspects of their society. There is therefore a need to improve design quality for bi-scriptual Latin and Arabic typographic layouts.

The next section demonstrates an analysis of a number of bi-scriptual Latin and Arabic case studies in different contexts, based on primary research carried out in Istanbul and London; visual analysis of historical bi-scriptual publications; and analysis of the style of available bi-scriptual Latin and Arabic typefaces within macOS and Microsoft. The aim is to identify all typographic approaches that embody good practice and those that illustrate the opposite,

with the aim of learning from the best practice to feed into the outcome of this research on defining the role of principles.

As part of primary research to identify best practices for print publications, I also analysed the design quality of bi-scriptual historical Latin and Arabic publications (1455-1811), to identify practices that are still relevant to today's needs. A comprehensive analysis can be seen in Appendix 5. The principles that played a role have been collected and included in the final results in Chapter 6.

3.2. Analysis of case studies

3.2.1. Analysis of a bi-scriptual Latin and Arabic Layout in an Airport

Bi-scriptual Latin and Arabic typographic layouts can be observed in many locations in airports, such as on my trip in 2019 to Amman airport, Jordan. The function of these layouts is to direct visitors towards specific locations, such as departure and arrival terminals, toilets and exits. Therefore, the role of bilingual typography is to facilitate understanding of a message for airport users. The design of bilingual boards at airports usually seems overloaded[115].

Due to limited space, some texts of minor importance are squeezed and presented in smaller size. In Figure 14, the text 'Smoking Room' and its equivalent Arabic text ' غرفة التدخين' are in a smaller font size compared with the other three texts, apparently to fit into the limited space. The Latin text may use extended weight of the typeface, but the Arabic text uses a smaller size, rather than a different typeface weight. Therefore, quite apart from the issue that the 'Smoking Room' 'غرفة التدخين' is not presented equally compared with other Latin texts, it also does not have an equal visual approach with its Arabic counterpart.

[115] Therefore, in most cases, there is a pictogram alongside the message to help readers to comprehend the message quickly.

The lack in Arabic of the variable weights seen in Latin typefaces may be the cause of the problem.

In addition, the inconsistency between the weight and size of same-script texts affects the status of the texts, since bigger-size text seems primary. Presenting a bigger text to give it more prominence might be a good approach, especially in such an overloaded layout, but the problem in this specific example is that the Latin text for 'Toilet' and its equivalent Arabic text 'حمامات' seems bigger, though the Arabic counterpart remains the same size as the other two Arabic texts. Therefore, if the primary status given to 'Toilet' in Latin is deliberate, why did the Arabic text not achieve similar status?

To sum up, in this specific example of Latin and Arabic texts grouped together in a layout, firstly, there is a lack of well-balanced treatment and equality between each group of texts; and secondly, there is a lack of overall balance and equality between the written elements in the overall layouts.



Figure 14. Translated bi-script typographic composition at airports. There is a different font size for each category of message on one surface, which is displeasing. In this specific example, 'Toilets' and its equivalent Arabic text ' حمامات' has a larger font size compared with 'Quiet Rooms' ' غرف للراحة', 'Smoking Room' 'غرفة التدخين' and 'Family Lounge' 'صالة العائلات'. Also the 'Smoking Room' 'غرفة التدخين' wording is condensed to fit within the limited space. Copyright © isctockphoto.com. 'Airport signs and pictograms written also in Arabic'.

3.2.2. Analysis of a bi-scriptual Latin and Arabic layout on the Dubai metro

The bi-scriptual Latin and Arabic approach on the Dubai metro shows a higher value given to the Latin script through both size and placement. Because they are on the move, readers require a quick scan of texts, so this approach for the majority of local readers who are Arab may cause difficulty in the swift recognition of Arabic text and intuitive comprehension of

the content. This design choice could have been made due to the typographic disparities between the typeface styles used for Latin and Arabic, and the fact that Arabic names are shorter than their English counterparts. Therefore, aesthetically it is more pleasant to position the Latin script at the top of the hierarchy, even though the majority audience are Arabic-script readers.

Noble and Bestley (2005), in their analysis of informative typographic layouts, discuss the issue that, in a design process, priority must be given to the function of the text: aesthetics come later. It means that, in this context, delivering a message in an intuitive way with a thoughtful arrangement of the information should be more significant compared with the aesthetic aspect of the layout.



Figure 15. Dubai Metro Sign, including juxtaposition of Latin and Arabic scripts.

Although the Arabic texts seem bigger compared with their Latin counterparts, the traditional calligraphic style of the Arabic typeface can negatively affect their legibility and readability. The middle-positioned letterforms of 'م' and 'خ، ج' are the most problematic. Figure 16 proposes alternative modern typefaces which present alternative shapes, but which are more legible and readable than 'م' and 'خ، ج' for stations on the Green Line, including 'Dubai Airport Free Zone', 'المنطقة' and 'المطار', and 'Greek' 'الخور'.



Figure 16. Analysis of the Arabic letterform 'م' within the Arabic typeface used in the Dubai Metro. Although the calligraphic style of the typeface is in accordance with the Arabic cultural background of the readers, it is not legible. The typeface on the left is Myriad Arabic, within which the middle-positioned letterform 'م' includes the 'eye' or 'counter'. With regard to the word 'الحره', the initial position Arabic letterform 'ل' sits at the top of letterform 'ح.' Typefaces used within these samples are not the exact typeface used for the Dubai Metro. Left: Myriad Arabic. Right: Adobe Naskh.

Moreover, due to the calligraphic style of the Arabic typeface, in some names that include 'ال' at the beginning of the name, the 'ل' sits at the top of the letterform, instead of sitting beside it before the middle letter. For instance, in the word 'الخليج' on Red Line stations (Figure 17), when the initial position Arabic letterform ل meets the middle position Arabic letterform 'ح', the 'ل' sits at the top of letterform 'خ ح ج' rather than sitting before it. This calligraphic approach, especially in such a context, where the texts are smaller in size and must be read from a distance, and – more importantly – while the reader is in motion, improves reading time and influences the reading experience. Linguistically, in the Arabic language, the majority of names start with 'ال', which implies that this approach would affect the majority of station names. If they were presented in the Persian language, this would not be an issue since linguistically in Persian – although it is written in Arabic script– the frequency of letterforms is different and the 'ال' does not appear at the beginning of names. Therefore, using a calligraphic typeface style for the Persian context may prove a different reading experience compared with Arabic.



Figure 17. Analysis of links between Arabic letterforms ل and خ within the Arabic typeface on the Dubai metro. With regard to the word الخليج , the initial position Arabic letterform ل sits at the top of letterform خ . Typefaces used within these samples are not the exact typeface used on the Dubai Metro. Left: Myriad Arabic. Right: Adobe Naskh.

However, as the research (Kapp, 2011) shows, taking into account local taste in choosing typefaces is an important issue. Considering the cultural background of people with Arabic culture, the traditional calligraphic style of Arabic typefaces may be an appropriate option. As Azmi and Alsaiari (2014) point out, due to the culture and the religious background of Arab people which is intertwined with divinity, a calligraphic style can be the best option to present texts in the Arabic language for Arabic readers due to its fluidity and ornamentation.

However, in the Dubai Metro example, the Arabic-script readers are not necessarily Arab. Dubai is a multicultural society comprising many different nationalities, of whom, for example, Persians, Hindus and Pakistanis are Arabic script users. Thus, a modern Arabic script with a less traditional calligraphic style may help to improve the legibility of the Arabic texts for all Arabic-script users, whatever their national origin. Simmonds and Reynolds (1989) have commented on the importance of considering the cultural background of the audience in a design process.

3.2.3. Analysis of a bi-scriptual Latin and Arabic layout with numerals

Apart from the juxtaposition of texts in bi-scriptual Latin and Arabic layouts, primary research shows that Latin and Arabic numerals coexist in some cases. As the literature review shows, numbers in both Latin and Arabic scripts may cause misunderstanding (Reilly, 2011), especially the use of the number 5. For instance, the layout in Figure 18 shows that,

due to the style of the typeface, the number fifteen in Arabic script '15' looks like the number 10 in Latin script, since the shape of the number 5 in Arabic is close to the shape of zero '0' in Latin. The rule of integrity and contrast identified in the literature review plays an important role here, underlining that the numbers must be distinctive, but pay heed to the culture of the readers. Getting used to see special characters in special forms, we must be careful that the visual forms of one script do not cause confusion because of their similarity to characters in a counterpart script; thus my observations show that the visual appearance of numbers in bilingual Latin and Arabic scripts layouts may lead to a misinterpretation in recognising the Arabic zero compared with number five. In Arabic, the zero is usually presented as a dot. Instead, number five, specifically in Arabic societies, is presented as a very rounded triangle very close to a circle, and in the Persian language it is represented as an upside-down heart. If this Arabic number was presented to a monolingual Arabic reader, there would be no confusion, because they know the zero of number 10 would appear as a dot rather than a rounded shape with a counter. However, it causes confusion for a bilingual reader, since they may consider the rounded shape as the zero used in Latin. Perhaps linguistic research may analyse this issue in more detail to see how the visual presence of the written symbols may be interchanged for a monolingual reader compared with a bilingual reader.

The lack of Arabic typefaces that support Arabic numbers is the main issue that causes this problem. For instance, while I was writing this essay, I could not manage to find a font in Windows supporting Arabic numbers. Therefore, within this text I had to present the number 15 in English letters. I conducted a survey to identify typefaces that support Arabic scripts in macOS and Windows. Despite the wide range of Arabic-script users, just nine typefaces out of 359 included with macOS are bi-script typefaces that support both Latin and Arabic scripts: Arial Version 5.06, Microsoft Sans Serif version5.00.1x, STSong 14.0d0e1, Songti SC, Songti TC, Tahoma Version 5.01.2x, Times New Roman Version5.05, Myriad Arabic 13.0d1e1 and Ultrafidian 13.0d2e2.[116] However, in writing up this thesis in 2023, I tried Arial, Microsoft Sans Serif, Tahoma and Times New Roman within MS Word Windows-

[116] Boutros (2009), carried out a similar analysis to identify the role of available Arabic typefaces in operating systems on the design quality of web developments in Arabic languages. For more information, please refer to Chapter 4.

based system, but none supports Arabic numbers: they support Arabic script, but they do not support Arabic numerals.



Figure 18. Bi-script typographic composition showing the juxtaposition of Latin and Arabic numerals. In this figure depending on the audience's visual experience in reading the numbers, they may confuse the number 15 in Arabic with the number 10 in Latin. Copyright © shutterstock.com. 'Street sing UAE. CU on the 15th Street sign with sector, zone and street name in Abu Dhabi, UAE – 2013'.

3.2.4. Analysis of bi-scriptual Latin and Arabic type-families in macOS and Windows

Observations in the earlier sections and previous academic discussions (Baki, 2013) show that the poor quality of some bi-scriptual layouts is due to the lack of corresponding typefaces in Latin and Arabic, as Arabic typeface styles do not match the Latin style. Designers use individual Latin and Arabic typefaces for bi-scriptual layouts instead of using appropriate bi-scriptual typefaces. This section assesses the reasons for their approach, and analyses available bi/multi-script typeface families that cater for both Latin and Arabic scripts. The aim is to identify whether the bi-scriptual typefaces offer typefaces which correspond.

Despite free availability of typefaces online (provided usually by freelance type designers), new versions of word-processing programs like macOS and Microsoft Word include a wide range of typefaces. For this study, I have chosen macOS,10.15, released in October 2019, as a sample, since it is one of the most recent and versatile programs in the world, available to both general users and graphic/type designers. The reason for focusing on typefaces available on macOS, rather than online typefaces, is that they are provided by type foundries, which are generally expected to include all the Standard Unicode characteristics

needed for the written format of a language. They also contain standard characters for both Latin and Arabic scripts. However earlier discussion shows some of these typefaces exclude Arabic numerals[117]. In contrast, online typefaces might only be available in a range of characters such as just UPPERCASE or just for creating displays which lack readability and give rise to concerns for continuous reading in smaller sizes. Finally, as the literature review shows, the majority of professional bi-scriptual Latin and Arabic typefaces designed by expert typeface designers are not available for free.

3.2.4.a. Arial and Times New Roman typefaces

Arial and Times New Roman are considered to be very different; respectively, one is sans serif type while the other is a serif typeface. But surprisingly, studies have revealed that both typefaces, despite offering very different tones and styles, share the same Arabic typeface within their typeface package (Nemeth, 2006). It seems a distinct Arabic typeface added to both Arial and Times New Roman, so although they present as a bi-script typeface, no attention was paid to the importance of achieving equality in tone and parallelism between the Latin and Arabic letterforms, either in Arial or in Times New Roman.

The latter has hairlines alongside the 'stems,' while the Arabic typeface excludes tiny 'strokes'. Also, the shape of 'titles' (dots) in Latin script is rounded, while the Arabic script uses the oriental diamond shape for 'dots.'

Furthermore, the Arial Latin script has a consistent thickness of 'strokes', while the Arabic is inconsistent. This difference in thickness makes the Latin script heavier compared with the same font size in Arabic script.

Furthermore, there is inconsistency in the shape of 'serifs' and 'stems' for one Arabic letterform in different positions. For instance, there are three different shapes of 'serif' for letterform 'alef, ا.' It seems the letterform 'alef, ا' is 'sans serif,' but when it meets the letterform ل, it becomes 'serif'. In contrast, letterform ل, in general, is a serif style, but when it reaches the letterform 'ا,' it becomes 'sans serif' (Figures 19 and 20).

[117] The list of available bi-scriptual typefaces are available on the Microsoft website.



Figure 19. Arial typeface. Arabic Script. Letterform 'alef, ا.'



Abjad

Figure 20. Arial typeface. Arabic Script. Letterform 'lam, ل.'

There is also inconsistency in the shape of 'serifs' (Figure 21).



Figure 21. Arial typeface. Arabic script. Different styles of serifs within one typeface.

3.2.4.b. Microsoft Sans Serif and Tahoma typefaces

Within the Microsoft Sans Serif and Tahoma typefaces, the visual map between the Latin and Arabic letterforms is more effective. Although, in terms of legibility, neither of them is particularly successful. For example, especially in bigger fonts, there is no balance between the 'needle eyes,' 'eyes' and 'counters' in the Microsoft Sans Serif Arabic typeface. The considerable proportion of 'eyes' and 'counters' create holes in a sentence and, as Samara (2014) noted, the large counters cause distraction for the eyes to track and follow the text. Another problem is that, within this typeface, the gap between the 'baseline' and 'descender line' for the Arabic script is reduced. Since Arabic letterforms have many descenders with wide-open 'counters', reducing the height of the 'baseline' and the 'descender line' visually implies a bigger size of closed counters in descenders. This phenomenon reduces the readability of the Arabic script.

In addition, setting the final position of Arabic letterforms on the baseline has a negative effect on legibility and recognition of letterforms (Figure 22).

ابجد هوز حطی سعفص متمم ثخذ ظضغ
jumps over a lazy dog

Figure 22. Microsoft Sans Serif typeface

There is also a problem with the position of dots. Arabic script is a fluid typeface, and many letterforms are distinguished by the different number of dots; different matrices must allow for the positioning of dots to ease recognition of letterforms within a word. As Figure 23 presents, alignment of all dots that sit below the baseline in the Tahoma typeface, caused overlapping of the dots with other parts of the letterform, especially in smaller font sizes. This hinders fast recognition of letterforms that include dots below the baseline.



Figure 23. Microsoft Sans Serif typeface

In addition, the anatomy of letterforms shows wide counters between the teeth of Arabic letterforms. Many Arabic letterforms are distinguished by the number of ‘teeth’; this approach encourages the reader to count the ‘teeth’, which is inconvenient with a long text (Figure 24). In traditional Arabic typefaces, the initial teeth of initial position letterforms are taller for fast word recognition. In analysing ‘Tahoma’, Kapp (2011) commented, ‘‘since the 1990’s a newer form of san-serif Arabic fonts, based on the Kufi script, such as Tahoma have been introduced both in print and on the web. They are widely used for writing on the Web and Advertising headlines. Their use in body text has however been described as an impediment to legibility”.

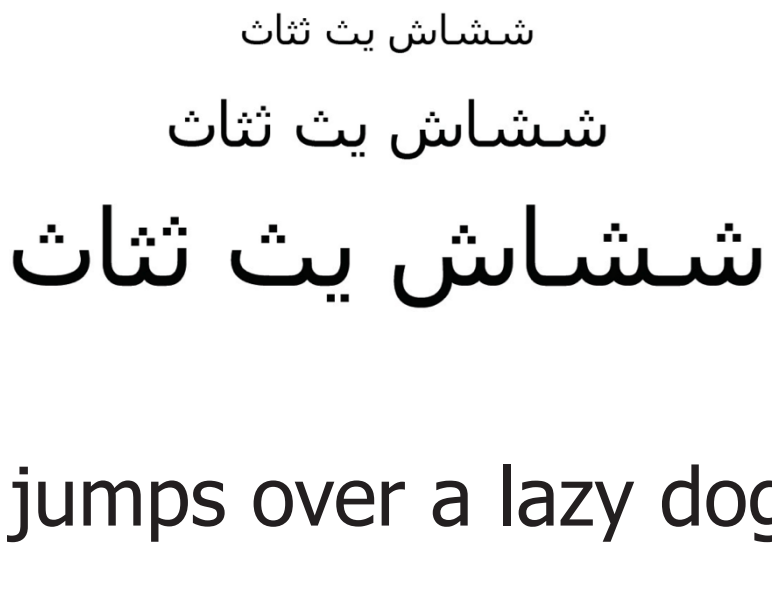

Figure 24. Tahoma typeface

In conclusion, the design of available typefaces within macOS does not allow for cultural integrity of the script and readability in one package. The typefaces cater for bi-scriptual use, but they do not approach harmonisation between the Latin and Arabic. This leads designers to rely on solo-script Latin and Arabic typefaces in their bi-scriptual layouts, which makes it more difficult to find harmonized typefaces with a balanced style.

3.2.4.b.i. Critical Analysis of Tahoma Typeface

I now analyse three problems that exist in the simplification of Arabic script in juxtaposition to Latin script, which demonstrate the lack of compensation for the optical correction of Arabic letterforms. The first unsuccessful approach in simplification of Arabic script is the alignment of the 'teeth' of all letterforms of ش س، ث، ت، پ، ب،. Most of the Arabic letterforms are distinguished by differences in the number of 'teeth,' therefore, the alignment of all 'teeth' causes a disparity in reading and fast recognition of the various letterforms in a word. For example, the letterform س consists of three 'teeth' and a 'bowl' which requires a different 'x-height,' compared with the letterform ب that consists of two 'teeth' and a 'cross-stroke'. Therefore, unlike AbiFarés (2001), who assigned the same matrix for the height of all teeth of all Arabic letterforms, I believe a higher matrix should apply for the tooth at the initial position of an Arabic letterform, compared with the height of 'teeth' in the medial and final forms. Assigning a different and higher matrix for the first

‘tooth’ of the initial position of Arabic letterforms, like applying a capital letter at the initial of a Latin name or a sentence, is an excellent aid for swift recognition of a word, i.e. legibility, which also improves readability. This issue has the same negative effect when all the ‘stems’ within Arabic letterforms are aligned. For example, alignment of all the ‘stems’ of Arabic letterforms within Tahoma, a bi-script typeface available within macOS and Windows, reduces intuitive recognition of letterforms and readability (Figure 24).
According to AbiFarés (2001:119): “Microsoft has also become interested in the visual aspects of type. The so-called OEMs (Original Equipment Manufacturers) involved in the creation of machines that render and print type are essential commissioners for type designers and type foundries”.
Additionally, the letterform س consists of three ‘teeth’ and a ‘bowl,’ while the letterform ب consists of ‘teeth’ and a ‘stem.’ Compared with a ‘stem,’ a ‘bowl’ requires a different glyph to join a ‘tooth’. Further, there is the lack of consideration of the alignment of all the dots located above the baseline, like the dots of ‘ت، ث، خ، ش، ز، ذ، ض، ظ، غ، ف، ق، ن’ and also the aligning all the ‘dots’ of letterforms that sit below the baseline, like ‘ب، پ، ج، چ’ . However, I believe the dots of different letterforms should sit on the different matrix based on their correlation with the anatomy of the letterform. For example, Microsoft Sans Serif typeface, a bi-script typeface available within macOS and Windows, aligns all dots that sit below the baseline. The ‘dots’ overlap with other parts of the letterform where the letterform with a ‘dot’ joins on to a final form of another letterform with a descender ‘bowl’.
Finally, the alignment of the ‘bowls’ of all Arabic letterforms to achieve one fixed ‘descender line’, as in the Latin Guideline system, is flawed in this approach, which does not take into account the multiplicity and variability in the shape of Arabic letterforms’ ‘bowls’.

3.2.5. An Analysis of Emirates, a branded bi-script typeface

The Emirates’ typeface, known as EK, is a bi-script typeface available in Latin and Arabic scripts, designed by Emirates Creative Services in cooperation with the Grapheast foundry for Emirates Airlines ‘هواپیمایی الامارات’ in 2003 (Figure 25).

EK is an example of good practice that demonstrates how the availability of a typeface designed without prioritising one script over the other empowers the web designer to create a more high-quality web design.



Figure 25. Emirates EK typeface, designed exclusively for Emirates airline.

The Emirates typeface is not available to the public. Therefore, for the purpose of analysing its characteristics, the Emirates website, which is available in different languages, has been chosen as a case study. Each language is presented separately on a different page. Therefore, the Latin and Arabic scripts are not simultaneously juxtaposed in one layer. However, for the purpose of analysis in the juxtaposition of Latin and Arabic script written with the Emirates typeface, I have selected the corresponding text presented on the English and Arabic pages for joining Emirates' Skyward program[118].

The EK typeface used for both display and body text for printed purposes, such as in the Emirates' bi-scriptual menu (Figure 26) is selected here. For digital purposes, EK is used only for display texts, such as headings. It loses its readability in small fonts in digital displays, indicating that designers must be mindful of the context and the layout environment when determining the relevant typefaces. For instance, Emirates Airlines' website uses the typeface for the titles both on the English- and Arabic-language pages, while body text on both English and Arabic pages uses the Arial typeface (Figure 27).

[118] Emirates' typeface is a display typeface only appropriate for titles.

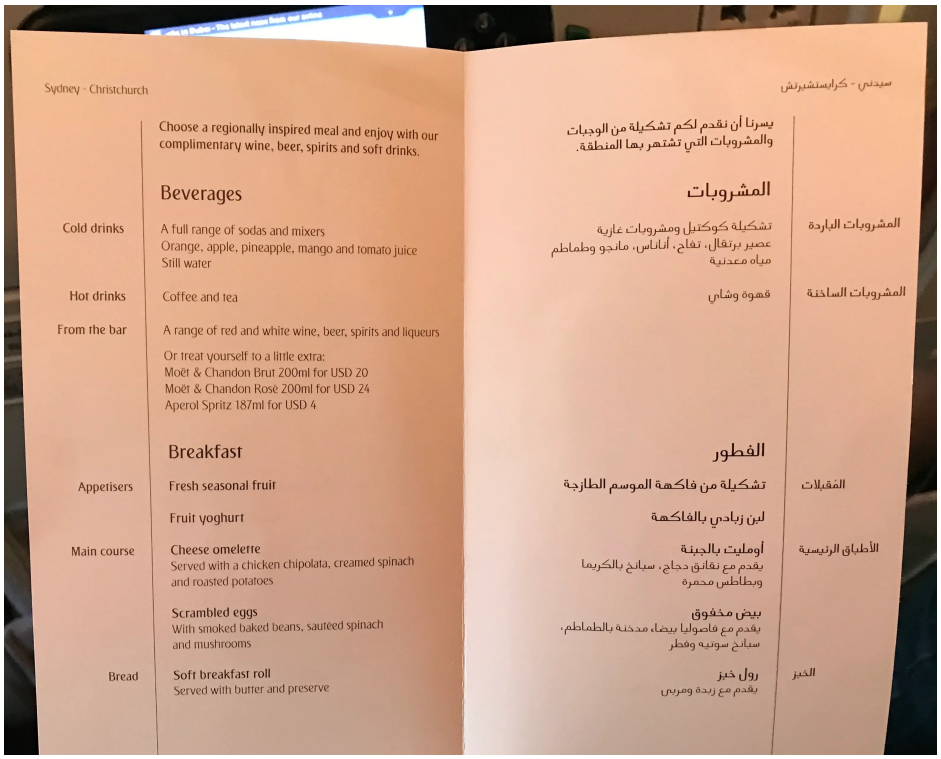

Figure 26. Bi-scriptual Latin and Arabic Emirates breakfast menu. Source: Quick Whit travel (2020), Emirates Economy Class review. Available from: < https://quickwhittravel.com/2018/09/20/emirates-economy-class-review/>. Use of Emirates typeface for both display and body texts in printing materials.

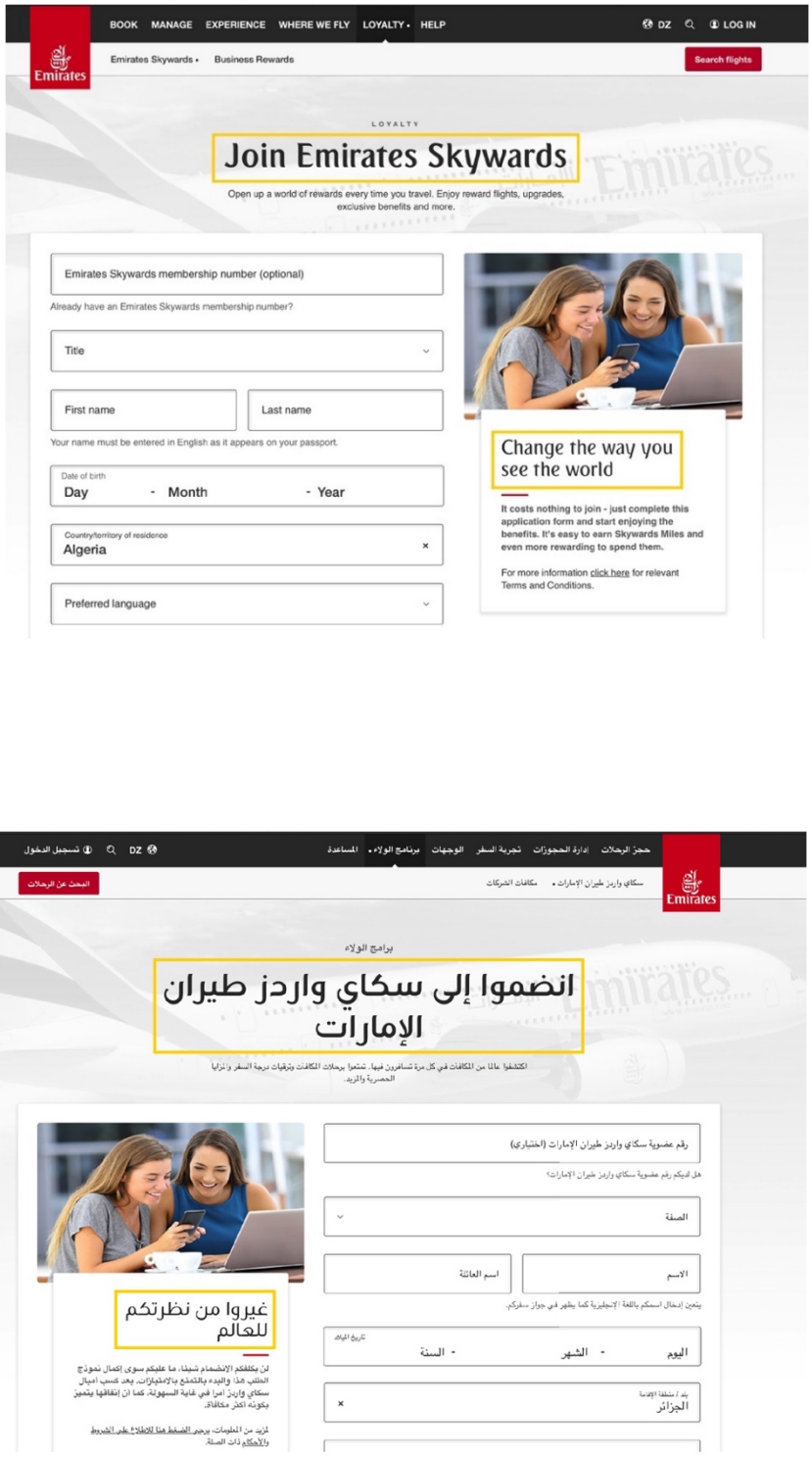

Figure 27. Emirates Airline webpages ‘Join Emirates Skyward’ in the English and Arabic languages. On both English and Arabic pages, the Emirate (EK) typeface has been used for titles, but the body text utilises the Arial typeface.
The Arabic script of EK ‘Emirates’ typeface includes wide open counters, big eyes and needle eyes, which are distractions in reading a long text. This issue reduces the readability of the text in smaller font sizes.

In simultaneous juxtaposition of Emirates' Latin and Arabic scripts, leading for Latin script has been increased to match the leading of Arabic texts. The Emirates typeface for Arabic titles in a large size shows unequal gaps between the Arabic letterforms. This is especially so when the final letterform of the preceding word includes open counters like 'ر', or the anatomy of the final positioned letterform does not have an ascender and x-height, as with the letterform 'ى'. In this case, because the initial-positioned Arabic letterforms always includes strokes drawn above the baseline, the gaps between words where the final positioned letterform of the previous word includes a wide-open counter, or only descenders, seem bigger compared with the gaps between other words within a sentence. As a solution, the gaps must be amended manually, smaller gaps must be introduced or applied automatically between these groups of words; or smaller counters should be applied to Arabic letterforms at the typeface design stage. Analysis throughout the course of this research demonstrates that this issue of applying smaller counters in designing an Arabic typeface plays an important role, because the anatomy of Arabic script includes multiple and variable counters combining closed and open counters. If these counters remain big and wide, many holes are created when the letters sit together to create a sentence, which would be a distraction for the eyes to read the text faster. It is exactly the same situation as Samara (2004) demonstrated in their analysis of optical disparities in the anatomy of capital Latin letterforms for 'E', where the space between the horizontal strokes of the 'E' is unequal and the issue is to adjust optical disparities and avoid distractions for the eye[119].

It seems the method of Latinisation has been applied to Emirate's Arabic script. Both Latin and Arabic scripts comprise five horizontal metrices with just one baseline, x-height, ascender line, cap height and descender line. Therefore, all the Arabic letter forms sit on one baseline and all the letterforms reach the same descender line. However, the baseline for the Arabic letterforms is positioned somewhat higher than that for the Latin letterforms, to provide a bigger gap for the Arabic descenders. The difference in the descender height between the Latin and Arabic script is recognisable to the human eye. It is a development in Latinisation of Arabic scripts.

[119] For more information about 'optical disparities' please refer to Appendix 1, Section AP1.11.

The Emirates Arabic typeface is not appropriate for continuous reading in body-text layouts. On the one hand, the Emirates typeface has a short descender height, which leads the focus to the x-height proportion of the Arabic letterforms. Since the Arabic letterforms have large numbers of open and closed counters within the x-height, and many open counters in the descender part, a focused approach on the x-height of letterforms affects the balance of the letterforms. Also, Arabic letterforms have multiple differently-shaped descenders[120], which are important in the recognition and legibility of the letterforms. In this case, by presenting the x-height part, which has many counters and bigger eyes, and applying the same short height for all the descenders, the focus remains on the top part of the script and distracts the readers' attention from the ascenders. Therefore, the script loses its readability in smaller font sizes.

The Emirates Airlines logo is also a bilingual logo in Arabic and Latin scripts. However, the interesting point is that the Arabic script used in the Emirate Airlines logo is not the Emirates typeface. The original logo was first created in 1985 by a British firm, Negus and Negus, with Arabic calligraphy and an English typeface (Figure 28). Within this design, the calligraphic style of the Arabic script has been especially preserved by emphasising the effect of the initial and the last connection of the calligrapher's nib when writing each letter on a paper (Figure 29). The creative approach in this logo design is that the effect of calligraphic forms is presented in a way that the initial and the ending of each stroke looks like a serif in the Latin counterpart. In this case although the calligraphic style of Arabic script is preserved, it tends to mirror Latin serifs.

[120] Among the 28 letters of the Arabic alphabet, the final positions of the nineteenth letterforms have descenders. In this case, there are six different shapes of descenders. For more information, please refer to Chapter 6.



Figure 28. The first Emirate Airline's logo, designed in 1985 by Negus and Negus, a British foundry. The approach is interesting in that the Arabic script preserves the Arabic calligraphic style, but at the same time by emphasising the point of movement of a stylus, the effects of Latin script's serifs and geometricity have been applied on the Arabic script, to achieve a visual map.



Figure 29. The initial and ending point of each letterform has been emphasised and presented, so as to become more like the Latin serifs.

The same approach has been used to reduce the fluidity of the Arabic letterforms and make it more geometric. In drawing Arabic letterforms in a calligraphic style, by stylus, there are rules relating to the movement of the stylus on the paper. For example, in drawing the letterform 'ر', the nib of the stylus should be positioned on the paper vertically. The nib moves down and towards the right, then without coming off the paper, the nib is delicately oriented left to draw a soft, fine descender. However, in the design of the Arabic Emirates logo, the points of changing the orientation of the stylus are angled to reduce the fluidity of the Arabic letterforms and make them more geometric (Figure 30).



Figure 30. Fragmented style of the anatomy of Arabic letterforms in the first version of the Emirates logo was a creative approach to reduce the fluidity of Arabic letterforms and make them closer to the geometric features of Latin Letterforms.

In 1999, a new version of the Emirates logo was introduced with a refreshed Latin script (Figure 31). A new Latin typeface was created to better reflect the calligraphic features of the Arabic letterform in the logo (Coles, 2017). However, the anatomy of the Arabic letterforms in the new logo has lost its geometricity, in order to represent the more fluid features of the Arabic script. Comparing the new version of the Emirates logo with its predecessor, it offers a more respectful version of the Arabic script by making the letterforms smoother and more fluent.



Figure 31. The latest version of the logo for Emirates Airlines, designed in 1999. The Latin script mirrors the calligraphic style of the Arabic logo. Also, the geometricity of the earlier Arabic letterforms has been removed and has become more fluid.

3.2.6. An Analysis of the bi-scriptual Nassim Typeface: a different approach

Nassim 'فونت نسيم' is a bi-scriptual Latin and Arabic script typeface. The Arabic script of this typeface is used for BBC Arabic; and the revised version, with a more Iranian look, is used for BBC Persian (Fonts in Use, 2013). The BBC uses a different font for English. Since the Arabic script of Nassim typeface has been considered successful, this section analyses Nassim's Latin and Arabic style in simultaneous coexistence (Figure 32).

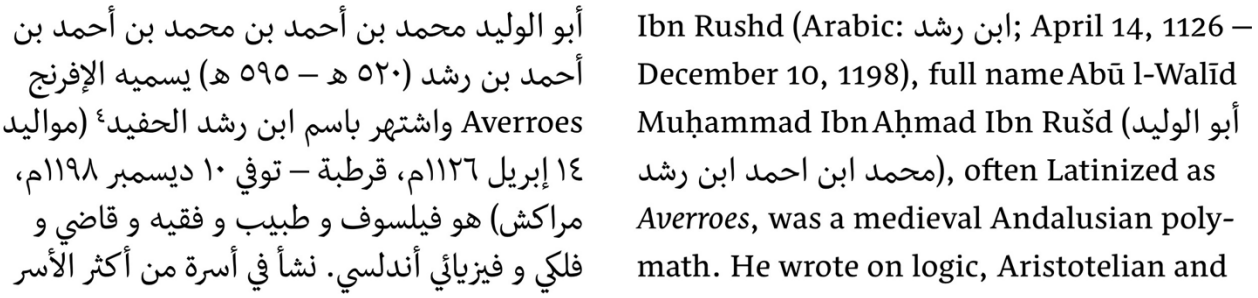

Figure 32. Nassim typeface 'فونت نسيم'. Coexistence of Arabic and Latin typefaces.

The first issue is that the angle of the teeth in the letterform 'sin, س' is different based on the left ligatures[121] while, in the middle position, all three teeth bend to the right. On the other hand, the characteristic of this letterform at the initial position is different from those of the next connected letterform. For example, to join the initial position of letterform س to the final position of letterform م , the two connected glyphs[122] sit on the baseline (right-hand text in Figure 33). However, in contrast, to connect the initial position letterform س to final position letterform ر, only one glyph applies. It comes out from the right-hand side of the letterform ر, which connects directly to the top point of the third 'tooth' of the letterform 'س'. In this case, the connected glyph sits above the baseline (the text in the middle in Figure 33). This style of glyph connection renders Nassim more calligraphic. It presents the same style applied to the middle position of the letterform 'ب'. Therefore, the

[121] Ligatures refer to the connected letterforms within an Arabic word.
[122] According to AbiFarès (2001), these horizontal strokes with the function of linking Arabic letterforms within a word are called 'glyphs'. These glyphs have the potential for extension and stretching. For more information, please refer to Appendix 1, AP1.9.

whole letterform sits above the baseline' Further research is required to determine whether this approach is more successful.



Figure 33. Analysis of letterform 'س' in Nassim typeface.

There is also inconsistency in the Italic style of Nassim's Latin style, compared with its regular style. Generally, the only difference between the regular style and the italic style of a typeface is the difference in the 'point of stress'. For the regular style, the 'point of stress' is usually upright, while for the italic style a diagonal 'point of stress' is applied. Here, of course, different 'points of stress' are applied for the italic style, but surprisingly the shape of 'serifs' and the angle of 'strokes' are changed and become more rounded (Figure 34). For example, the italic style of the lowercase letterform 'v' has a rounded 'crotch'; the 'serifs' are only applied on one side of the stroke. It has a sharp 'crotch' and straight stems. The regular style of the lowercase letterform 'e' also has sharp angles, while the 'eye' of the italic style is round. As Arabic has no italic version, this design may have occurred as a result of cultural influences.

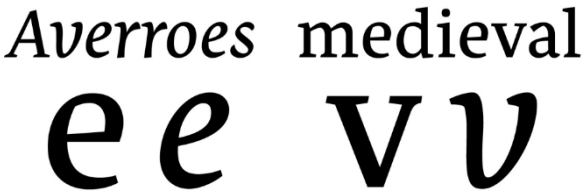

Figure 34. Analysis of italic approach in Nassim typeface.

It seems Nassim's typeface aimed to make Latin script more fluid, to bring it visually closer to the cursive character of Arabic script, rather than making Arabic script more geometric. Interestingly, for instance, Latin letterforms have a different 'body-size'. The 'cap line' of the uppercase letterform 'I' is in a lower position compared with the 'cap line' of the lowercase letterform 'b', which is not a common approach in Latin typeface design. Also, 'serifs' are longer on one side of the 'stem' and opposites mirror the upper side compared with the bottom side (Figure 35). This is an excellent example to show that, in typeface design, the script's cultural identity should be considered. Titus Nemeth, the creator of the Nassim

typeface, acknowledges the Arabic script's culture through his approach to the script's readability.



Figure 35. Nassim typeface, a different approach.

3.3. Primary Research in Istanbul, Turkey

Photos from Istanbul, 2022 can be seen in Appendix 3.

Istanbul is a multicultural city, home to people of three main cultural backgrounds: Turkish people who speak Turkish, written in Latin script; Arabic people who migrated from Syria and Lebanon who speak Arabic, written in Arabic script; and Kurdish people using the Kazakh language in Cyrillic script[123]. In addition, Istanbul welcomes many international tourists, most of whom communicate in the English Language written in Latin script. Consequently, multiculturalism and its influence on written bilingual communications are pervasive in Istanbul. During my stay there in July 2022, I observed and analysed typographic approaches in different sections of the city. Being in such a multicultural environment allowed me simultaneously to be a researcher and audience/reader of typographic layouts. The analysis shows a mixture of four languages (Turkish, Kazakh, English and Arabic) in typographic layouts representing the different communities of the city of Istanbul, which could be listed as:

a) 'Multi-scriptual layouts': typographic layouts that include all four languages –Turkish, English, Arabic and Kazakh – together, written in Latin, Arabic and Cyrillic script respectively.

[123] Recently the government ordered the change from Cyrillic to Latin script. However, the Kazakh language is still used interchangeably in Cyrillic and Latin.

These layouts include the juxtaposition of multi-scripts and multi-languages (Photos I. 1, I. 2, I. 3-B, I. 4) Multi-scriptual layouts automatically imply a multilingual approach.

b) 'Bi-scriptual multilingual layouts': typographic layouts juxtaposing more than two languages, but written in two scripts. For example, the juxtaposition of Turkish, English, and Arabic constitute a multilingual approach, but since Turkish and English are both written in Latin script, the layout remains bi-scriptual (Photos I. 5, I. 6, I. 7, I. 8-A, I. 9).

c) 'Bi-scriptual bilingual layouts': typographic layouts that include two languages, each written in a distinct script. For example, the juxtaposition of Turkish and Arabic is bilingual, but since they are written in Latin and Arabic, that layout becomes bi-scriptual (Photos I. 3-A, I. 3-C, I. 8-B, I. 10, I. 11-A, I. 23-B, I.25)

d) 'Mono-scriptual bilingual layouts': typographic layouts that include two languages such as Turkish and English, therefore the layout is bilingual, but both languages are written with the same script, Latin, which keeps the layout mono-scriptual (Photos I. 11-B, I. 12, I. 13, I. 15, I. 17, I. 18, I. 19, I. 20, I. 21, I. 22, I. 23-A, I. 24).

e) 'Mono-scriptual multilingual layouts': Typographic layouts that juxtapose more than two languages, such as Turkish, English and Kazakh, but all written in Latin script; therefore, although the layout is multilingual, it remains mono-scriptual (Photo I. 26).

From these results, we can conclude Ashrafi's approach to defining 'bilingual typography' does not seem applicable to the various bilingual typographic layouts that I identified in Istanbul. The problem is, his use of 'distinct letterforms' is only applicable to typographic layouts, such as English and Arabic, that use different scripts.

I can read and understand the English language. I can read Arabic, but cannot understand it fully, and I am unable to read or understand the Turkish and Kazakh languages. Being in an environment, observing variable typographic layouts with different mixtures of familiar and unfamiliar languages, gave me an opportunity for 'perspective-taking' (Galinsky et al., 2008)[124]. I was influenced by the statement of Charlotte Kemp (2008:9, cited in Aronin and Hufeisen, 2009) that, in an analysis of a bilingual typographic layout, the layout could be seen from three different aspects: the readers', that of the researcher, and the bilingual

[124] *According to Galinsky et al., (2008), perspective-taking is the act of perceiving a situation or understanding a concept from an alternative point of view, such as that of another individual.*

layout itself.

This allowed me to evaluate the level of my engagement depending on familiar and unfamiliar languages or scripts used in the layout. For instance, in the juxtaposition of English and Turkish, or Arabic and Turkish languages, I was familiar with both scripts, but a reader of one language in each case. Although the Turkish language was unfamiliar to me, I managed to find a readable language in both situations, but it was more convenient to identify Arabic in juxtaposition to Turkish, since Arabic uses a very identifiable script with very distinctive visual forms. In comparison, identifying English in juxtaposition to Turkish took longer, since both use the same script.

In the juxtaposition of Turkish and Kazakh, both languages were unfamiliar to me. Since both used the same script, it was difficult for me to differentiate the languages. I established that readability[125] and recognition of a familiar language is intuitive in bi-scriptual approaches, more especially in the juxtaposition of those scripts that share a very distinctive visual appearance and anatomy of letterforms. With the juxtaposition of scripts with similar anatomies of letterforms, such as Cyrillic and Latin, although two different scripts are used, but due to visual similarities between the anatomy of Cyrillic and Latin letterforms, it took me more time to identify that the message was English, compared with recognising the English message in juxtaposition to Arabic.

Identification of a relevant language in juxtaposition to the Turkish and English languages varied, especially regarding those bilingual messages that exclude Turkish letterforms with dialects. In such Turkish-dialect messages, or those with extra letterforms (i), (I), (ğ), it was easier to identify that it was Turkish (Figure 36). As an reader attempting to distinguish an English message from Turkish, I had to read the message to see if it made sense or had a meaning in English. In some cases, the frequency of letterforms helped me to identify the relevant languages, so this lack of intuitive recognition of relevant language increased the reading time.

[125] The analysis of 'readability' can be seen in Appendix 1, Section AP1.3.



Figure 36. Veznecilar, Metro İstasyonu, Istanbul, Turkey, 2022. Including a letterform with dialect (ğ), which made it easier for the reader to distinguish the Turkish language from the English.

Regarding the issue of reading time in bilingual layouts, scholars (Rutley, 1972; Harjula et al., 1998; Jamson et al., 2001; Kinnear et al., 2012) have commented that a larger quantity of text on a bilingual layout, compared with a monolingual layout, increases reading time. My observations in Turkey show that two factors increase the reading time in bilingual layouts. First, there is a need to identify the readable language, which is more challenging in the juxtaposition of languages that share similar writing elements. Secondly, I found that my status as either in motion or motionless, and the position and location of the layout, affected the reading time.[126] For example, I found it more challenging to identify a language when I was inside Metro stations (Underground stations), compared with reading a local shop sign or display layouts, because while reading the signs on the Underground I was either walking towards the layout or passing it from a distance; or I was using an escalator and had to read a sign on the wall on the other side; or I was inside a train in motion and had to read static bilingual layouts outside. In these cases, I had limited time to pick out the relevant information. To read local shop display signs, however, unlimited time was available. As a result, I found that the reader's situation – whether are in motion or static – highly influenced the reading time of bilingual typographic layouts.

In addition, to investigate the movement's effect on reading time of a bilingual layout, I analysed the reading time of kinetic bilingual layouts. I identified the static or kinetic presentations of the layout, in a static or temporal environment, regardless of readers' motion, which is another factor that can affect the issue. For example, imagine you are

[126] Reading time is not just influenced by movement of the audience, but also according to movement of the typographic layout. For more information, please refer to Appendix 6.

reading a bilingual movie credit, or you are driving while reading a bilingual road sign in Welsh. In the first example, you as a reader are static, while the layout is kinetic. There is limited time available to you to identify the relevant language and read the message. If you do not read the data in the available time, you miss some information. In the second example, you as a driver are in movement, while the bilingual layout is static. Depending on the road situation you can control the speed to allow more time to recognise a familiar language, but focusing on this while you are driving may increase your risk of accident.[127]

As a conclusion, I believe the two languages/scripts used in a bilingual typographic composition should be adequately recognisable and distinguishable from one another, so the reader can identify their preferred language intuitively. However, my observations show totally different typographic approaches are needed depending on whether the two languages share one or similar scripts, or a totally distinct set of scripts. In addition, readability depends on whether the bilingual layout is displayed in a static or temporal environment, and depends on the situation of the reader.[128]

Notably, on some particular occasions, when I was familiar with both languages, according to the time I might have had available to read both languages, or just read the language in which I was more fluent, the one that I saw first was that, following the hierarchy of presented languages. In this case, the top language in a vertical arrangement was mostly first. In horizontal arrangements, it depends on the reading direction of the texts; for instance, if both are written in Latin, the language on the left is read first.

In my analysis of bilingual typographic layouts in Istanbul, I observed that bilingualism there is not necessarily defined as the juxtaposition of two languages in one typographic layout. Photos I. 27 to I. 29 show shops side by side, with monolingual display signs, but each presented in different language demonstrating a bilingual or multilingual typographic approach. This is very different from considering bilingual typography as the juxtaposition of two languages in one layout. Here the messages may not have any correlation. The

[127] As discussed in the literature review section (Chapter 2),Kinnear et al., (2012), point out: “bilingual road signs increase the safety risk of viewers.” Also, the report by Rutley (1972) shows a high rate of road accidents in Wales, demonstrably influenced by drivers’ distraction while reading bilingual English and Welsh signs.

[128] The literature review showed that finding a solution for this phenomenon is a point of focus for a substantial number of research projects on bilingual traffic road signs.

typography bilingualism approach in Istiklal Street, Istanbul, was developed as the coexistence of variable layouts each in a different culture and language rather than the typographer's attempt to create a bilingual layout. This adds a new view to bilingual typography approaches in urban areas, where bilingualism as the juxtaposition of two languages does not necessarily happen within one display: it is not always the creation of a typographer or designer. However, this research focuses on individual bilingual typographic layouts, including juxtaposed languages on one layer. Perhaps it remains for another researcher to evaluate this different aspect of the typographic context of bilingualism in urban environments.

Observing bilingual approaches at Istanbul Metro stations, I noticed that the bilingual approach occurred mostly in messages that link readers with the meaning of the text. Signs tend not to be bi-scriptual for proper nouns where the two languages use the same word. For example, in Photo I. 19, 'Exit' is presented in both English and Turkish ('çıkış'), but the station names are displayed only in Turkish. This is because both Turkish and English are written in Latin script; therefore a visual presentation of a name in Turkish with Latin letterforms would be the same in the English language. However, there would still be a problem for English readers to read and pronounce Turkish names, since Turkish has extra letterforms for special sounds. For example, I attempted to pronounce the Turkish word 'Cami', which means Mosque, as 'Sami' or 'Kami', but it turns out the 'C' sounds like 'J' and I should pronounce it 'Jami.' Therefore, for situations where accurate pronunciation plays a crucial role in communication, presenting the name in one language may not be sufficient. But this approach is different for bilingual Arabic and English languages, where the name in Arabic is also presented in English, since the visual presentation of the same name in each language would be different, due to the variation in scripts. Readers of one script may not be capable of reading the other. This phenomenon provides differing challenges in the juxtaposition of Latin and Arabic script for situations and markets where readers are bilingual and capable of reading and understanding both Arabic and English since, if the readers are monolingual, they have no idea about different cultures and customs of the juxtaposed languages; but, if they are bilingual, they are familiar with the culture and habits of both scripts and the influence this has on their perception and sense of engagement. As a

typographer and tutor, Baki's (2013) research focuses on the importance of having a new approach for bi-scriptual Latin and Arabic scripts in Lebanon for bilingual readers.

In multilingual signs in Turkey, the juxtaposed languages do not necessarily present the same content. Shop signs including the juxtaposition of Arabic and Latin in Istanbul (whether bilingual or multilingual) mostly included Arabic for descriptions. The names of the shops are presented in an inconsistent approach for different displays. For instance, they may be shown monolingually on the shop sign, but bilingually in the projecting sign or in the shop window. Alternatively, it may be presented bilingually in all cases, but is present in different sets of languages each time. In Photo I. 3, two additional signs are used: one presents the Arabic world 'Fal' juxtaposed with Cyrillic and Latin, and the smaller one shows the word 'Fal' in Cyrillic and the Persian language 'فال'. In a few cases, the Persian language was observed on signs, but interestingly none of them included Arabic and Persian on one layer. This was probably since both use Arabic script and, because the body size of Arabic script is larger than the Latin, having to use two languages in Arabic script, especially for longer messages, made fitting them onto a limited space a challenge. For short texts, on the other hand, Persian and Arabic sit beside Latin perfectly (Photo I. 5). This implies that, in a bi-scriptual approach, designers may face different challenges, depending on the context and space.

In situations where texts sit on a vertical baseline, such as in Photo 1.23-B, Latin letterforms' flexibility makes them suitable for stacking – sitting on top of each other – while still remaining readable; Because Latin letterforms are separate, they can also be rotated according to the baseline. Arabic text also shows flexibility, since it is a cursive script[129] where some letterforms join to former or later letters, but guide the reader to read from top to bottom. Therefore, Arabic can be rotated 90 degrees while maintaining the integrity of the whole word, since stacked letterforms cause challenges for the readability of the whole text. Considering the principle of inclusivity identified in the literature review, we must consider dyslexic people who may find stacked letters harder to read, since recognising the whole shape of a word becomes more of a challenge.

[129] Arabic letterforms may connect to the former and previous letterforms within a form based on their position in the word. For more information, please refer to AbiFarès (2001:93).

The hierarchy of information in these typographic approaches in Istanbul consistently presents the dominant language at the top. For example, in Photo I. 3-B, since 'Fal' originates from eastern culture, the Arabic language on the side sign is positioned at the top, prior to the Kazakh and English languages. In the restaurant menu (Photo I. 1), the Turkish language is positioned at the top, since the restaurant sells Turkish food. Similarly, in Photo I. 10, Arabic is positioned at the top, since the restaurant sells Arabic food and, in Photo I. 7, the Persian language is positioned at the top since this service is only applicable to Iranians. In every other case, where Turkish culture is dominant, the Turkish language is positioned at the top, as in the Metro and Airport signs.

It is difficult to comment on typographic design quality of the layouts that include Arabic script. Since those including Latin and Arabic remain in the minority, only five out of 36 include Arabic script, mostly presented multilingually, rather than bilingually. My lack of knowledge about the culture and typographic habits of the foreign languages on these layouts is a barrier to evaluating their design quality. However, the use of varying font sizes in some cases, such as Photo I. 1, seems overwhelming, particularly when too much information in several languages is presented in a limited layout. As the literature review shows, acknowledging the culture of scripts plays an important role in the success of a typographic layout, and multilingual typography should be treated differently from bilingual layouts, taking account of the varying background of readers. Therefore, it was decided not to evaluate the design quality of these layouts, due the limits of the researcher's knowledge of multilingual requirements.

To sum up, the bilingual and multilingual typographic layouts in Istanbul show that the typographic objectives, and consequently ruling principles, in the juxtaposition of different languages with similar scripts are very different when compared with layouts containing different languages sharing distinct sets of scripts. Acknowledging the different typographic relationships between juxtaposed languages with similar or different scripts is necessary for defining and understanding the field of bilingual typography. As the outcome of this primary research and as a contribution to knowledge, a new categorisation is proposed for the field of bilingual typography, which it is hoped will map out a path for future researchers and designers to decide on different typographic treatments for each category.

3.4. Primary Research, Edgware Road, London

Photos of North Finchley and Edgware Road, London, UK, 2016, can be seen in Appendix 4. I conducted primary visual research to analyse bi-scriptual Latin and Arabic shop signs in two areas of London in 2017: Edgware Road, home to many Arab residents, and North Finchley, which has a high proportion of Persian and Afghan citizens. They all use Arabic script for written communication, although they speak different languages, and come from different cultural backgrounds. As part of this research, 39 bi-scriptual Latin and Arabic examples were found, including shop signs, window stickers and projecting signs. All the businesses have either Arab, Persian or Afghani owners and each mostly focuses on a market based on their own culture, welcoming people with the same ethnic background**.** My findings as to design quality is as follows:

1. There are two approaches for the presentation of the business names on bi-scriptual layouts. The first is to use Latin letterforms to transliterate the Arabic or Persian or Afghan name. For example, 'محل 'in Arabic is written 'mahal' in Latin-Finglish (Photo L. 35). The second approach is for the Arabic name to be translated into English. For example, the word 'صيدلية امير 'in Arabic is translated into Latin as 'Prince Pharmacy' (Photo L. 16).

2. In 22 of the 39 cases[130], Arabic logos, which in all cases are the business names in typographic style, are presented in very different typeface styles compared with the juxtaposed Latin logos. Also, in 12 cases[131], Latin and Arabic do not follow the same colour branding. The failure to use corresponding typefaces results in inconsistent tones and styles in the juxtaposed Latin and Arabic scripts.

These inconsistencies present Arabic script readers with different identities for a business compared with the identity Latin script readers perceive for the same business. Considering the principles of integrity, balance and equality identified in the literature review, the Latin and Arabic texts in these layouts, although they have integrity and are distinguishable intuitively, there is a lack of balance between the visual elements and a lack of equality

[130] *Photos L. 1, 3, 4, 5, 7, 8, 9, 15, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 30, 31, 32 and 33.*
[131] *Photos L. 1, 2, 4, 5, 7, 8, 9, 10, 12, 13, 21 and 22.*

between the status of the two languages. Therefore, the Latin text on these layouts delivers a different brand and identity compared with the Arabic.

This approach implies the designers failed to pay sufficient attention to their role of delivering a unique brand or identity for the business through the bi-scriptual typographic layout to both Latin and Arabic readers, who approach the layouts from different cultural backgrounds. Having different tones and styles for Latin texts compared with juxtaposed Arabic presents a different business identity to Latin readers compared with Arabic readers. This approach may be useful in mono-scriptual bilingual layouts, since different styles and fonts help intuitive recognition of the relevant language that by its nature uses the same script, but it does not work for the juxtaposition of Latin and Arabic.

Bilingualism in these examples is used just as a tool to present the information in English, to enable English readers to gain an understanding of the meaning of the words. The importance of visual communication in bilingual layouts to appropriately demonstrate the Latin text visually in balance and equally to Arabic has been neglected. This issue may not be applicable in other contexts. However, in a shop sign, regardless of whether it includes a logo or not, the informative texts play an important role in the identity of the business. Therefore, even if the name of the business is presented in two languages, the bilingual approach as a whole, and individual sets of names in different languages, should deliver uniform tone and style. The visual presence of the names on a shop sign plays an important role in user engagement with the business and its services. Therefore, for this specific context, bilingual design needs some knowledge of branding principles, or at least the designer should familiarise themselves with the business identity, in order to make an appropriate decision for the visual elements of each script, and thus to ensure both present a similar feeling and identity to readers of each language.

Analysis of popular brand logos that have both Latin and Arabic versions, such as ‘FedEx’ ‘فيديكس’, ‘Nutella’ ‘نوتيلا’, ‘Tide‘ ‘تايد’ and ‘Twix’ ‘تويكس’ (Figure 38), with no consideration of simultaneous bi-scriptual practices shows similar graphical and typographic elements; the same colour and type style helps to achieve a balanced treatment between Arabic and Latin type versions. However, it is out of the scope of this research to analyse branding; further

research needs to investigate the role of branding in bilingual approaches[132] and principles for those specific contexts.

The point is that a bilingual typographic approach could play a role in giving similar instinctive 'gut feelings' to audiences of different cultures which is missing from the design of Edgware road's bi-scriptual Latin and Arabic layouts. This revealed a bigger role that bi-scriptual typography can play in society; that it could be a medium for presenting the identity image of a brand simultaneously to different groups of readers/audiences with a range of cultures and languages[133]. However, these inappropriate decisions are usually made by vernacular designs and there has always been a challenge for vernacular designers to access the latest academic research. This may raise some concerns regarding the necessity of investigating a new approach on how to inform vernacular designers about academic approaches[134].

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[132] Marty Neumeier, the creative brain behind Google and HP brands, is an American author writing about brand, design and creativity. In his interview about 'what branding is', he mentioned that a brand is a result. It is the "gut feeling about a promise, service or company" (Neumeier, 2019). He also claims the brand is not the logo, is not the product, and is not the promise. The customers take whatever the businesses throw at them, and it is about the feeling that the customers get in their heads as the result of seeing or using the material. But the emphasis is that a brand exists in every material the business uses, including the logo, advertising campaign, website, employee behaviour, quality of services, etc. (ibid.). In this case, a bi-scriptual bilingual shop sign plays a significant role in the result, and the gut feeling the audience gets from the business.

[133] During my professional career as a graphic designer, especially with local businesses who start a new enterprise in a high street local shop, I observed in most cases that the business owners, who are those who place an order, do not have any knowledge about the brand and the importance of considering consistency of approach and identity in every material that presents their services and business. On the other hand, most local shop signs' designs are created by practitioners or 'non-designers', who have good skills in using software to create a logo or design, but they are non-educators, or as the typographer and author David Jury (2011) claimed, 'non-typographers/non-designers' [1]. Therefore, the creators of these signs decide according to their personal preference and rely mostly on the owners' personal preferences, design taste and preferred specifications. The self-taught graphic designer Adrian Shaughnessy, in his book *How to be a graphic designer, without losing your soul*, refers to the difficulty of the graphic designer's job in applying appropriate design elements, which in some cases may be contrary to the client's preferences. Shaughnessy discussed the role of the designer as an educator who must educate the client about the role of appropriate design. And as part of this, designers' knowledge plays an important role (Shaughnessy, 2010). Therefore, improving the design quality of typographic layouts depends on the designers' knowledge and ability to identify the objectives and function of the layout.
However, as Gassas (2016) points out, international companies with proper branding have a manual of brand guidelines. According to the investigations of Balius (2013:49): "It seems there are more books on Arabic calligraphy than books on Arabic typography". For a list of books on Arabic typography, please refer to Balius (2013).
[1]: As the result of critical analysis in Appendix 1, Ap1.1. I defined:
Typographers: As professionals with academic knowledge on typography's convention and its effects. Non-typographers: As individuals without professional knowledge of typography's conventions and their effects.

[134] Regarding this issue I presented an article in 2021 at the IICE 2021 conference in the USA, discussing the gap in employing educated designers in industry since, in the majority of cases, local sign shops and design companies recruit people with higher experience in the use of software rather than educated designers. The article investigates the pros and cons of this phenomenon and offers a work-based learning (WBL) workshop for educational sectors to link pedagogy with the aim of establishing a path for educators to be replaced with non-professional vernacular designers.

3. The hierarchy of information in most shop signs is appropriate, since priority is given to the primary information by choosing the superior font, besides adequate space being dedicated to frontal shop signs. However, it seems no attention is paid to the hierarchy of information in the shop windows (Photos 13, 19) and projecting signs. Too much information presented in a limited space results in the use of inappropriate style and inconsistency in fonts[135], in using code-mixing and in hierarchy. It seems information is squeezed to fit within the available space. Such designs would benefit from a more professional alignment.

The hierarchy of information does not just aid reading the preferred message first, but it also helps to recognise the category of information. Studies (Williams, 2004; Saltz, 2009) show that hierarchy is an important principle in typography. Regarding its influence on readability, graphic designer DeFelice (2020), in an analysis of legibility in typographic poster designs in Latin script, points out that the design of typographic layouts, especially those with more text, should aim to speed up the recognition of relevant information by the reader. According to DeFelice: "being legible doesn't just mean that the viewer can actually read the poster. Make sure the viewer knows what you're advertising, selling or promoting." The unstructured arrangement of information due to lack of appropriate alignment and hierarchy makes it difficult to understand what messages the layout is delivering prior to reading all the information; therefore, it negatively affects legibility.

4. In 11 cases[136], the slogans or services are presented in one script, either Latin or mostly Arabic. This approach may be determined by a number of reasons, such as the lack of space or the demographic of readers: the primary audience's background may influence the decision regarding the dominant script. In two cases (photos 22 and 27), the Arabic name is presented in a large font, with the Latin counterpart in a very small font underneath (and in one case (Photo 39) vice versa). This approach may be a good example of hierarchy, as mentioned previously. However, the concern arises that establishing communication in London with many audiences familiar with Arabic languages is an excellent approach to dominant Arabic script on bi-scriptual layouts in such a diverse, multicultural city; but,

[135] *Photos 1, 4, 6, 7, 19, 37.*

[136] *Photos L. 1, 2, 6, 7, 8, 11, 14, 15, 17, 21 and 33.*

although the Edgware Road is home to many Arabic residents in London, the region includes many businesses that welcome people from other cultures who are unfamiliar with Arabic.

5. In 7 cases[137], two different Arabic typefaces were used on a sign. The typeface used for the Arabic logo is illegible, as it is too small for presenting descriptions or services. Similarly, using different Latin typefaces is apparent in a few cases[138].

6. In all cases, the numerical data, including the shop number and the telephone numbers, are presented only in Latin, although the Arabic script numerals[139] have a distinctive visual. This approach has also been observed in the advertisements and city signs in the Lebanon and Cairo presented previously.

7. In 29 out of 39 cases[140], a sans serif Latin typeface was used for the logos. 12 cases[141] used capital letters for the logo in Latin script. It is difficult to describe the different typeface styles used for Arabic script since the Arabic typefaces have not been classified or distinguished according to serif or sans-serif. Besides, Arabic letterforms do not have capital or lowercase styles.

The logos in Arabic names mostly use the Kufic and Naskh styles[142].

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[137] *Photos L. 1, 14, 16, 18, 27, 31 and 32.*

[138] *Photos L. 1, 3, 4, 7, 8, 10, 16, 20, 36 and 39.*

[139] According to AbiFarès (2010:218): "current Latin numerals have their origins in Arabic and the current Arabic numerals have their origins in Hindi."

[140] *Photos L. 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37 and 39.*

[141] *Photos L. 1, 2, 3, 6, 9, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 25, 26, 27, 28, 29, 30, 32, 34, 36, 37 and 38.*

[142] For more information about different styles of Arabic script, please refer to AbiFarès (2001). Acknowledging differences between seven styles of Arabic script is essential for type designers. However, it is useful knowledge for layout designers in deciding between typeface styles, since each typeface that designers use is based on one of these styles and requires different leading. In addition, some styles – such as Kufic – are more geometric, thus with more visual similarities with Latin script. However, it is not appropriate for continuous reading, since it loses its readability in smaller font sizes: it is more appropriate for titles (Mesghali, 2009).

Nowadays, typeface designers, according to their experiences regarding audience preferences, decide about one of the seven Arabic styles as the typographic basis for creating a new typeface. In the views of Mesghali (2015), the Naskh style is the basis of Persian typefaces in Iran, because it is the most legible script for Persian readers. Mesghali (2009) notes that the invention of Arabic moveable types for Persian book printing in the 17th century, was based on the Arabic Naskh script, which had been used to write the Quran.

Although these two prominent designers in Iran believed in the usability of Naskh for current typeface designs, other Arabic script designers select a range of styles as basic Arabic typeface designs in other countries. Zoghbi (2015), claims: "Thuluth is the most elegant Arabic script." He claimed that Thuluth makes the process of creating a font family in Arabic and Latin quicker and more inspirational. As a result, the basis of typeface 29LT Zeyn created by Zoghbi and Party is Thuluth. "These were added to enhance the script's 'elegance,' and elegant is, after all, what Zeyn means," claimed Zoghbi (2015:47) in her recent discussion in Eye magazine.

Furthermore, it was recently suggested in a panel that, in Arabic-speaking regions, the accepted style is Naskh, but in the regions where Urdu, Pashto, Bengali, Panjabi and Sindhi are spoken, the preferred style is Nastalique (Mansour, 2015).

This issue, once more, shows the importance of cultural background, but this time from a different perspective. It could be said that either it is the cultural background of the readers/audiences that determine which Arabic style should be the basis of the typeface design, or it is the the Arabic style's cultural background that determines what market or audience is going to accept the typeface.



Figure 37. Arabic script needs different line spacing compared with Latin script. The 18th page of *De idolatria liber* with text in Hebrew, Latin and Arabic.



Figure 38. Samples of well-known branded asynchronous bi-script logo design. Including 'FedEx', 'Nutella', 'Tide' and 'Twix'

Arabic script has various styles. The majority of practitioners recognise seven styles 'Kufic, Naskh, Thuluth, Rayhany, Ruqaa, Nasta'liq and Diwani.' However, AbiFarès presents more than nine styles of Arabic script. For more information, please refer to AbiFarès (2001).

3.4.1. Critical Analysis

In a comparison between bilingual approaches in Istanbul with Edgware Road and the Lebanon, I observed a mixture of monolingualism, bilingualism and multilingualism in one area in Istanbul totally different from bilingual approaches in London. Although London welcomes a more multicultural population, there is a consistent approach in bilingual typographic approaches in Edgware Road, London, compared with those in Istanbul. In the Edgware Road, almost all the businesses are consistently bilingual in Latin and Arabic. However, in Istanbul, there is inconsistency of bilingual approach. In addition, there is no evidence of code-mixing in the Edgware Road, whereas a mixture of codes is pervasive in Istanbul's bilingual approaches. For example, a variable approach was observed in Istanbul's Metro station. Some information is only in Turkish, while other information is presented in English and Turkish, and surprisingly, some information is presented simultaneously in Turkish, English and Kazakh. This code-mixing differs from the mix of languages observed in bilingual magazine approaches in Lebanon. In Turkey, the mix of codes happens on different display signs in any given environment, but each individual sign has all the information monolingually, bilingually or multilingually. In the Lebanon, however, a mixture of codes is visible on one specific layout or display item.

Compared with Edgware Road in London and Lebanon, the different structures and presence of bi-scriptual layouts in Istanbul's urban environment shows how different cities' urban structures affect bi-scriptual layout approaches. Perhaps UK signage is more informed by a history of design principles. Various reasons may have influenced this approach, for instance UK design studios may cooperate more with professional designers due to political and economic regulations, while in other countries vernacular or non-professional designers may play a bigger role in design decisions. Furthermore, as part of my experience studying for my BA in Graphic Design in Iran, and my MA in the United Kingdom, and also as part of being a lecturer for MA Design courses with large numbers of international students at the University of Hertfordshire in UK, I was able to identify that the learning outcomes at Creative Art and Design courses in UK education are very different compared with those in Asian countries, such as Iran. Therefore, not all educated designers on the same course around the world gain similar skills. It is beyond the scope of my research to analyse the

reasons for this, but it could be an interesting topic for further research, to compare the role of educational design courses in preparing designers for a variety of cultural layouts in different countries. Finally, as part of my experience living and working in Iran and the UK, I identified political and cultural regulations in every country influencing the expected design quality of a city as whole, which may not be irrelevant for this approach. Again, another investigation is needed to identify the impact of these issues.

Chapter 4: Defining the Field of Bilingual Typography

4.1. Introduction

4.1.1. Research Scope focusing on Bilingual Typographic Categorisation

The results of primary research and visual observations conducted during the course of this study[143] show that the role of typographic principles in guiding bilingual layouts may vary depending on the writing elements and typographic properties of the coupled languages, on the typographic environments[144] that the two languages connect and on the different relationship(s) between the written elements of the juxtaposed languages in different contexts. In brief, the role of typographic principles depends on languages' 'writing systems', 'typographic environment' and 'method of juxtapositions'. Therefore, to determine principles for bi-scriptual Latin and Arabic layouts, it is necessary to identify different categories of bilingual typography. The outcome(s) of this category analysis contribute to:

- Identifying and defining the remits of this research, making explicit about categories are included and excluded from this study.

[143] Primary research conducted during the course of my studies influenced my decision regarding categorisation of bilingual typography, including observation of bi-scriptual Latin and Arabic script airport signs in Amman international Airport, Jordan (2020), and the analysis of bilingual mono-scriptual, bi-scriptual and multi-scriptual navigation signs in metro stations and local shops in Istanbul (2022, full details can be seen in Section 3.3.). Another area is the analysis of animated bilingual Latin and Arabic typographies used in logo designs of 'Almadina TV Channel' and YouTube Channels.
Primary research conducted during these studies influenced my decision to categorise bilingual typography contexts including the analysis of bi-scriptual Latin and Arabic script shop signs in Edgware Road, London, (2016, full details in Section 3.4), and analyses of Lebanese bilingual road signs found online (full details of findings and analysis in Chapter 3).

[144] Research by Barbara Brownie (2015) shows typographic environments could be divided into 'static environment' or 'temporal environment'. More information on each environment's typographic customs is available respectively in footnotes 26 and 14.

- Identifying which categories each principle applies to, and to what extent the role of the principles may remain the same or different in different categories.
- Identifying and validating the extent to which the practice and research of current typographers in the field of bilingual typography, including foreign sets of languages, are valuable for this research. Particularly with limited availability of sources and practices in the field of bilingual typography, categorisation helps to identify the necessary typographic considerations for the juxtaposition of foreign sets of languages, compared with the juxtaposition of Latin and Arabic scripts.
- Determining the potential for extending the results of this research to other juxtaposed sets of languages.

4.1.2. Research scope based on bilingual typographic context

In the analysis of graphic 'design projects'[145], Noble and Bestley (2005) stated that a good understanding of the 'context' is required to determine the audience's needs and to identify the design objectives. As they assert (p56): "once a solid understanding of the context is reached, the focus for the project can be determined". For instance, Baki's (2013) research on the arrangement of Latin and Arabic script in poster designs in Lebanon, shows that readability is an objective in body-text bilingual typographic layouts. However my observations indicate that it may not be an objective for some display-bilingual layouts, such as local shop signs. Research by Rutley (1997), shows that reading time is an important objective in bilingual road signs since it influences driving safety. Similarly, my experience analysing navigation signs in the Metro in Istanbul, engaging with bilingual airport signs in Amman and analysing bilingual approaches in temporal typographic environments[146], points to the significant role of reading time in all of these situations. However, it is less important in the design of bilingual books or restaurant menus, where readers have unlimited time in a static situation to absorb the information. Consequently, according to context, the needs of

[145] Any design that aims to communicate with a group of audience with a specific context is considered a 'design project' (Margolin and Buchanan, 1995; Laurel, 2003).

[146] Temporal typography refers to the type presented in the digital environment, either in motion (serial presentation), or as animated letterforms and type (kinetic typography).
For comprehensive information on typographic 'temporal environment' and categorisation, please refer to Brownie (2015:6). For differences between temporal typography and static typography in terms of typographic principles, please refer to Appendix 6.

the audience and the typographic aims and objectives may become different. Applying the same principles in different typographic contexts may result in a high-quality design in one context, but poor quality in a different context, because quality is not about perfection or standardisation. It is about the outcome meeting the requirements of objectives (Giangregorio, 2019).

In addition, the literature review above shows that the lack of clarified, defined contexts of bilingual typography cause disagreements between typography researchers and practitioners of Latin and Arabic typographic layouts, since they are working to meet different undefined criteria. For instance, Soheil Ashrafi, an academic, explorer and essayist at the intersection of art, Latin and Arabic typography, culture and philosophy, comments (Ashrafi, 2015:8): "Despite a wide range of practices, alongside an expanding intellectual framework and an increasing determination to tackle the issue of multilingual communication, bilingual typography, in practice, remains situated within the boundaries of monological systems." his article 'Bilingual typography considered from the standpoint of Banktin's dialogism'[147], he asserts that a wide range of bilingual typographic practices, such as *Matchmaking in the city*[148]; and bi-script Latin and Arabic typefaces 'Frutiger Arabic' and 'Neue Helvetica Arabic'[149], cannot truly be considered 'bilingual typography'. In his view, these practices lack integrated unity and dialogue between the juxtaposed languages (Ashrafi, 2015). According to his precise definition, the mere presence of two languages on a typographic layout is not sufficient for 'bilingual typography'; dialogism is the necessary element (ibid.).

In contrast, the analysis of typographic practices and research in juxtaposition of Latin and Arabic during the course of this research (AbiFarés 2001, 2010, 2016; Blankenship, 2003; Papazian, 2004; Nemeth, 2006; Kapp, 2011; Maag, 2012; Baki, 2013; Balius, 2013; Chahine, 2013; Dhawi, 2017)[150], almost all of whom used 'bilingual typography' in the publications' titles shows the coexistence of Latin and Arabic texts, including the arrangement of texts and activity of 'bi-script typeface[151]' design and any research considering these activities

[147] The work of Bakhtin's dialogism in music and sound influenced his dialogical approach to bilingual typography. For more information, please refer to Ashrafi (2015).
[148] AbiFarès, 2010.
[149] 'Frutiger Arabic' and 'Neue Helvetica Arabic' are typefaces designed by Nadine Chahine.
[150] Although all these sources shed light on bilingual typography practices, none provides a definition for the field.
[151] For a definition, please refer to Appendix 1, Section AP1.5.

was sufficient to consider that practice as a contribution towards the field of 'bilingual typography[152]'. None of the aforementioned sources restricts the practice or the field to 'dialogism'.

Ashrafi's claim about its necessity – 'dialogically integrated' – in bilingual layout, is applicable only to a specific layout where different written elements of two scripts are integrated to create a new unified identity. The reason he did not recognise AbiFarés' and Chahine's practices as really tackling bilingual typography, is that, in his view, these practices use the two scripts as 'formal-material' without dialogical integration.

According to Ashrafi (2015:7): "in order to be dialogically integrated, the formal-material structures of two sets of letterforms must be interdependent, such that removing one would render them mutually illegible." This definition is applicable for bilingual logo designs that integrate two 'distinct'[153] sets of scripts to create a unit identity (Figures 54 and 55). In which case, removing each script's elements would make the identity illegible[154]. However, my observations show, in other bilingual contexts, that two sets of scripts may sit independently side-by-side, such as in 'code-mixing', 'code-switching' and 'parallel' bilingual layouts[155] (Baki 2013; Tam 2017). Ashrafi's definition does not apply to bi-scriptural approaches that each language and script would be recognisable, legible, and readable in the absence of the juxtaposed language.

These disagreements originate from the lack of analysis of context for bilingual typography that may include different relationships between the juxtaposed languages' writing elements. For example, as mentioned earlier, Ashrafi's definition and argument are truly valid for 'Hybrid Layout[156]', but not in parallel bilingual layouts. Since Ashrafi commented on the issue generally without exploring the applicability of his definition in different contexts, his argument remains open to criticism. Therefore, the lack of analysis of context is another challenge to gaining a common understanding. This gap could be one of the reasons that designers lack skills in working with Arabic script, since the contexts of bilingual typography

[152] For a definition please refer to Appendix 1, Section AP1.2.b.

[153] I borrow the term 'Distinct' from Ashrafi (2015) to refer to languages written in different scripts. It is not applicable for other types of bilingual typographic layouts, in which the two juxtaposed languages share the same script, such as the juxtaposition of Welsh and English languages or Turkish and the English language.

[154] I call this group of bilingual typographic layouts, 'hybrid layouts'. For a definition and examples please refer to Chapter 4, Section 4.3.2.c.

[155] For the definition and clarification please see Chapter 4, Section 4.3.2.a.

[156] Hybrid Text is a terminology I use to refer to bilingual typographic approaches whereby two scripts' letterforms merge together to create a new identity, consequently the identity would not be legible in the absence of either of the scripts.

are varied and they influence design decisions. As the literature review shows, the general sources that provide guidance for creating bilingual layouts, shorn as they are of context analysis, were not sufficient to improve designers' skills.

The decisions about the contexts that I propose in this research have been made according to the analysis of bi-scriptual Latin and Arabic layouts in static environments[157]. Further research will need to be conducted to identify whether the outcome is similar to contexts of other sets of juxtaposed languages, or to the same set of languages in other typographic environments.

Analysis of context is about how relationships between the same sets of languages could differ in different layouts. The typographer and head of Communication Design at Hong Kong Design Institute, Keith Tam, in his work proposing a systematic approach for English and Chinese letterforms in bilingual layouts in Hongkong, identified a key element in bilingual typographic context (2017:29). It is: "about how various constituent parts of each language interact with each other, under many different contexts for many different purposes". Therefore, despite the first attempt at categorisation of bilingual typography that made a distinction according to the use of different languages or scripts on a layout in different environments, the 'context analysis' of the languages or scripts remains the same in the same typographic environment, but they are distinguished by different visual connections between the languages' writing elements in different layouts, and different objectives as such.

Both 'Categorisation of Bilingual Typography' and 'Context Analysis' proposed in the following sections are the results of primary and secondary research conducted during the course of this study. A full analysis of primary research (full details mentioned in Footnote 11) which results concluded the categorisation of the field of bilingual typography and

[157] Studies show that a static environment refers to space excluding any object movement. It is only the action or change of a physical identity that makes a motion (Gerhard, 1999; Bourne et al., 2016). In the field of typography, 'static' – static typography – refers to the 'tradition of print typography', including text that is always consistent and stable (For et al., 1997). The term 'tradition of print typography' in this context refers to the visual style of type presentation independent of print materials and approaches.

In brief, the characteristics of static text in a static environment could be defined as the typographic layout including the presented messages being always steady, stable and fixed without any movement or changes over time. Therefore, the characteristics of letterforms and the 'elements of typography' within the bilingual layout remain consistently the same, independent of the audience response, action and movement. This means, although the typographic elements of the texts may affect audience behaviour and action, the opposite is not true since the behaviour and action of the audience have no effect on the visually-perceived style of the text. Thus, the relationship between audience and type in the static typographic composition is not a cause-and-effect relation. The type always remains legible and readable at any moment.

context analysis, is presented in different chapters in this research, where the results are more relevant. This Categorisation and Analysis of context are not the aims of this research, but identifying them is necessary to improve understanding of the field, to gain a better understanding of the remit, and also to justify later discussions. Therefore, Section 4.2. (Categorisation of Bilingual Typography), and Section 4.3. (Analysis of context in bilingual typographic approaches) are parts of the research outcome and contribution to knowledge, and lay foundations for following chapters.

4.2. Categorisation of Bilingual Typography

My observations of bilingual typographic practices accessed online, in both static and kinetic environments,[158] and of bilingual typographic approaches in static environments in London, Istanbul and Amman, show that the relationship between the written elements of juxtaposed elements and the user's experience is different, as follows: firstly, based on similarity or differentiation of scripts used for the juxtaposed languages; secondly, depending on the simultaneous or asynchronous presence of the two languages; and finally, readability depending on the stability or movement of the layout or the audience.

4.2.1. Similarity or differentiation of scripts

'Bi-scriptual bilingual typography' and 'Mono-scriptual bilingual layout'

Research in the socio-linguistic field of study identified that 'bilingualism' refers to the use of two languages (Li and Moyer, 2008). Thereby, either juxtaposition of English and Welsh languages which share the same script, or juxtaposition of Latin and Arabic languages which share two distinct sets of scripts, could be considered as a bilingual typography practice. In both scenarios, two languages are involved, but they need different typographic guidance, since the visual relationship between them differs in each scenario.

The visual appearance of scripts and the typography principles where the two languages share the same script remains the same for both languages. However, the culture, anatomy,

[158] These practices include bilingual magazines, and books, as examples, accessed via an individual typographer's blogs, websites and publications.

and typographic needs of writing elements are different for each language when juxtaposed languages share different scripts: for instance, reading and writing in opposite directions, the difference in anatomy of letterforms, different joining systems, the challenge of applying 'correspondence typefaces'[159], different alignments and beginnings and endings of paragraphs, varying text lengths, different apparent text sizes, the unbalanced colour of text blocks on the page, the different use of the Cartesian space that results in different leading and therefore registration (Nemeth, 2006:6); these are among the language-dependent problems for typographers. Other 'typographic elements' (Bringhurst, 2002)[160] such as font size, alignment, leading and kerning remain a concern in both scenarios. For example, the leading gap for Latin text in the French or German languages may be different from a Latin text in the English language because of varying use of diacritics applied to different sounds in the different languages.

Due to these differing typographic needs between the two scenarios, and for the sake of a clearer mutual communication and understanding in discussions about bilingual typography specifically in this research, it is necessary to divide them into two distinct categories.

At the start of this research in 2016, all practices concerning juxtaposition of either distinct sets of scripts, such as articles on juxtaposition of Latin with foreign languages, or those focused on juxtaposition of languages with the same script, were referred to as 'bilingual typography'. It was just recently, in 2020, that the founders of Eps51 design studio Ben Wittner and Sascha Thomas, in cooperation with Timm Hartmann[161], used the term 'bi-scriptual' as the title of their publication to address the juxtaposition of languages with different scripts.

Influenced by the terminology used by Wittner et al. (2020), I divide bilingual typography by means of the various similarities or differences of written elements into the two categories of 'Mono-scriptual bilingual layout' and 'Bi-scriptual bilingual layout'.

It should be noted that bi-scriptual and mono-scriptual practices are not limited to bilingual

[159] The definition is available on Appendix 1, Section AP1.8.

[160] According to Bringhurst (2002: 107), typography elements in static typography include: "typefaces, point sizes, line length, length, line-spacing (leading), and letter-spacing (tracking), and adjusting the space between pairs of letters (Kerning)". Similarly, Kahn and Lenk discussed the effects of typography in GUI, listing six items as 'typography elements' including 'typeface', 'point size', 'line length', 'line-spacing', 'leading', 'letter spacing', 'tracking' and adjusting space between pair of letters', 'kerning'.

[161] Timm Hartmann is a creative designer who draws connections between design, culture and society (*Wittner et al.,* 2020).

approaches, since each may be observed in multilingual typographic layouts. For instance, based on my observations in Istanbul, the juxtaposition of English, Turkish and Arabic would be bi-scriptual practice, but it is a multilingual typography rather than bilingual. For the purposes of this research, bi-scriptual layouts refers to bilingual typographic approaches. Practitioners of bi-scriptual Latin and Arabic typography (Baki, 2013; Balius, 2013) used 'multilingualism' parallel with 'bilingualism' in their articles, which implies both multi-lingual typography and bilingual typography must be treated similarly in typographic terms. Bilingualism and multilingualism are used interchangeably in academic typographic articles, due to the lack of investigation into the similarities and differences between juxtapositions of two languages compared with the juxtaposition of more than two languages. However, research by Albert and Obler (1978) and Nation and McLaughlin (1986, cited in Aronin and Hufeisen, 2009) demonstrates there are qualitative and quantitative differences between individuals using two languages compared with those who use three. Research in psycholinguistics and sociolinguistics shows different brain reactions in bilingual people compared with multilingual people, whether readers or designers of a typographic layout. Besides typographically, a higher number of texts with a greater variety of languages' written elements and typographic customs in multilingual layouts compared with bilingual layouts, require different considerations. Therefore, from a typographical perspective, multilingual typography may need to be treated differently from bilingual typography. In this research, we therefore make a distinction between the two. Further research in multilingual typography is needed to identify whether the typographic conditions, grammar and principles proposed for bilingual typography in this study could be serviceable for multilingual layouts (Figures 39, 40).



Figure 39. Mono-script bilingual layout in Welsh and English Stock Photo ID: 2099658748
Prestatyn, UK. Dec 14, 2021: the Railway Station Car Park is operated on a pay and display basis.



Figure 40. Bi-script bilingual layout in English and Arabic. Circular Labels (76mm) for the Caspian Lounge ' کاسپین ' in London. Designed by SK Graphic Design Limited.

4.2.2. Simultaneous or asynchronous presence of the two languages

'Simultaneous bilingual layout' and 'Asynchronous bilingual layout'

Bilingualism has unlimited boundaries as to when and how two languages meet. The presence of two languages without their consistent simultaneous juxtaposition could also considered a bilingual typography practice. For example, in a digital temporal environment, such as a bilingual website, the second language may appear in a 'serial method' by scrolling down the page, or by switching into another layer or page. In this case the two languages do not coexist. They are apart and operate independently in separate layers. Also, in a kinetic typography, one word or letterform may appear in the absence of the first word (Figures 41, 42). In all of these cases, one language is displayed in the absence of the first language, which I refer to as 'asynchronous bilingualism'.

One may argue that asynchronous bilingualism could not be considered a practice of bilingual typography, since the decision about the majority of typographic principles such as leading, alignment and kerning would be made according to the solo language's typographic needs.

However, considerate is important to remember that, in an asynchronous bilingual approach, both languages and their written elements are part of one composition. The typographic decisions for both languages must respond to a unique identity of the brand and provide a common experience for readers of both scripts. For example, in the Emirates' bilingual website (Figure 27), where the texts in English and Arabic languages are presented on different pages, the design and typographic decisions, such as colour, typeface style or

font size for both languages match, so both scripts visually present the Emirates' unique brand[162]. The same approach applied to bilingual Latin and Arabic book covers is presented in Figure 41. However in this context, we only consider that the designs created by one designer should follow a consistent grid. Artefacts created by multiple designers are excluded from this category. Similarly, in the bilingual kinetic typography shown in Figure 42, the decision about the width of the letterforms' stroke and their style for each script is clearly made with regard to the feasibility of morphing Arabic script to Latin, with the aim of marrying the visual appearance of Latin letterforms to Arabic, although one would be absent if the other were present.

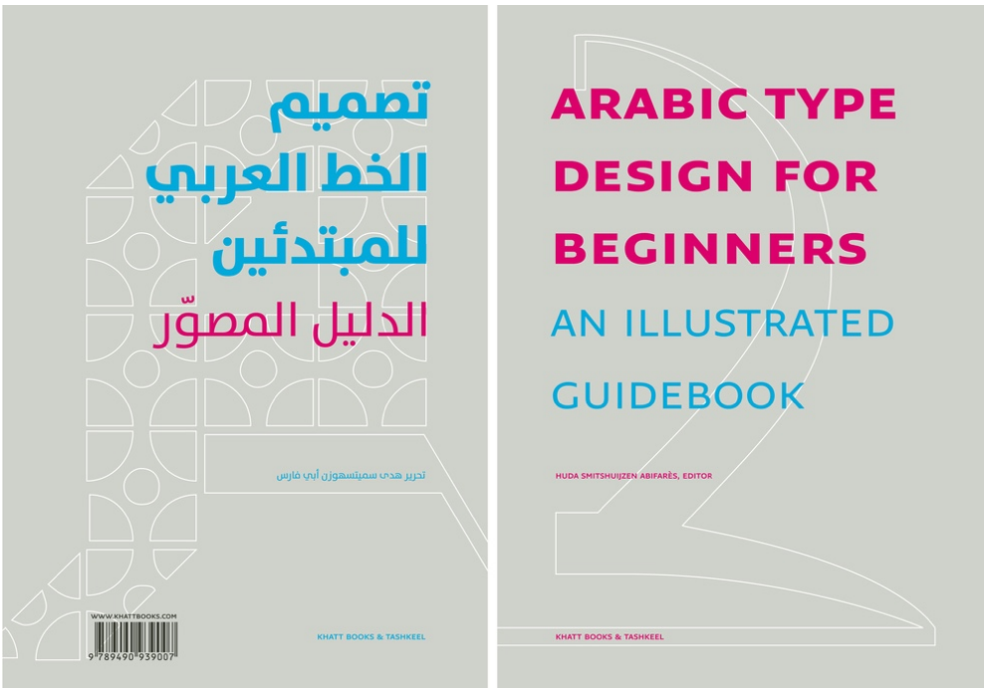

Figure 41. Asynchronous bilingual typography. The front cover of 'Arabic type design for beginners' and the back cover 'تصميم الخط العربي للمبتدئين'. This design uses a similar layout by the same designer. Copyright @ Khatt Foundations.

[162] A full analysis of typographic approach for 'Emirates' in available in Chapter 3, Section 3.2.5.



Figure 42. Bilingual perspective. Asynchronous bi-script bilingual layout. Kinetic typography. Top: Latin letterform 'S' transformed to its phonetically-counterpart Arabic letterform 'س'. Bottom: Latin letterform 'W' transformed to its phonetically-counterpart Arabic letterform 'و'. Copyright © Fikra Design Studio (2015). The video is available at https://vimeo.com/128003770.

Consistent simultaneous presence of two languages, which I call 'simultaneous bilingualism', invites the eye to a deeper visual comparison of the two languages' written elements as compared with an asynchronous approach. Optical disparities are more visible when the two scripts are presented simultaneously, and both stay visible permanently without any movement, as opposed to when one script appears in the absence of the primary, either in an animated or static format. This phenomenon is also true when typographic bilingualism is surrounded with an enclosed, more limited space.

Consequently, bilingual typography could be divided into categories: '*simultaneous bilingualism*', and '*asynchronous bilingualism'*; since each script's visual perceptions, typographic customs and the relationship between the written elements of the two scripts would be varied depends on the coexistence approaches in different typographic environments. Both simultaneous and asynchronous bilingualism could be bi-scriptual or mono-scriptual, and vice versa.

Furthermore, as examples show, both simultaneous and asynchronous bilingualism could turn up in static environments, including print, and in temporal environments, including static digital and kinetic samples.

Boutros (2009) analysed the bi-scriptual coexistence of Latin and Arabic in a web design context, and discussed the challenges that result in poor design quality for Arabic. His foci were on the practice of disregarding Arabic reading culture in ready-made solutions

compared with Latin, and the poor quality of Arabic fonts in operating systems[163]. Further areas Boutros analysed include inappropriate design trends, such as making Arabic texts bolder to make them more legible in websites (which is worse still in multilingual web design approaches), and difficulty in deciding on an appropriate layout in an 'intermingled'[164] approach, because of the opposite reading directions of Arabic and Latin. Boutros claimed that web developers are responsible for the look, feel and typographic and directional control in multilingual websites. This implies that they acknowledge the role of multilingual design principles, which is a necessary requirement not just for graphic designers, or typographers, but also for web developers. Additionally, he identified grammatical marks and accurate spacing before and after commas, both of which differ from one language to another, which must receive special attention in bilingual layouts. The User Experience (UX) design concerning eye direction must also receive special treatment. For example, the eye-catching point for the Arabic reader is the top right, while for Latin users it would be top left. Boutros finally discussed the cosy relationship of technology with Latin typography, while for Arabic the burden remains on the manual effort of developers[165]. An outline of his suggestions to improve design quality of multilingual approaches in websites includes "a true multilingual system is a system where all languages, and therefore, both reading and writing directions, are treated equally" (2009:28).
These discussions consider UX, and technology development is more relevant for the bi-scriptual approach in a temporal environment compared with print. More information

[163] Boutros also discussed how developers must use available fonts originating in the operating systems, including Arabic fonts proposed by Microsoft, Macintosh and Linux, which means Arabic developers cannot even use their own default typefaces, since they may not be available on the end user system and may cause changes of font for their purposes. According to his analysis in 2009, Windows has four basic fonts, including, Arabic Transparent, Simplified Arabic, Traditional Arabic and Tahoma (a Unicode Font), which, according to Boutros, are all of very poor quality. (There are some tools such as 'Typographical Images' in web developing systems, that allow developers to use its own default typeface, and change it to an image, or install it on the user server when they use the website. These are mostly used for headings. However, according to Boutros, it is very difficult to produce an image from any text written in Arabic (or Farsi or Urdu), therefore Arabic developers are effectively deprived of this feature.
In this respect I analysed the available bi-scriptual Latin and Arabic fonts proposed by iOS 2015. This analysis is available in Chapter 3, Section 3.2.4.

[164] He used the term 'intermingled' for situations where both texts are present together on one web page. He distinguished this situation from one where both are present separately on different pages, since in the latter situation, it is easier for a developer to adjust the text direction but in the former situation it must done block by block.

[165] For example, introducing translation management to allow users to translate an article into their languages. However, there are many arguments that state that translating apps, such as Google Translate, do not understand the cultures of the Arabic or Farsi languages. Therefore, in the majority of the cases, a proposed translation is based simply on the literal meaning of the word, rather than within cultural contexts.
Spell Check, according to Boutros, is a feature lacking Arabic support, as an Arabic spell checker is more like a mature toy than a real productive tool.

about why ruling principles in temporal and kinetic approaches must be separated from a print environment is provided in Appendix 6.

4.2.3. Outcome: Proposed Categories of Bilingual Typography

Therefore, according to my analysis, the field of Bilingual typography could be divided into four subcategories of:

- Simultaneous mono-scriptual bilingual layout
- Simultaneous bi-scriptual bilingual layout
- Asynchronous mono-scriptual bilingual layout
- Asynchronous bi-scriptual bilingual layout

4.2.3.a. Simultaneous mono-scriptual bilingual layout

Juxtaposition of two languages that share the same scripts. Both languages are present concurrently within the same overall composition. For example, the juxtaposition of the English language with Welsh on another layer, on road signs (Figure 43); and the juxtaposition of English and Dutch on the page of a book (Figure 44), are simultaneous mono-script bilingual typography. English and Welsh or English and Dutch, use Latin script in their writing systems and present consistent, statically and simultaneously.



Figure 43. Simultaneous solo-script bilingual road sign, including English and Welsh languages written in Latin script.



Two contrasting projects

S.T.I.P. (System Typography Integrated Program)

The first S.T.I.P. project ("*stip*" means dot in Dutch) was an architectural monumental signage program to apply the corporate identity of what was then known as TPG Post to a series of some 110 buildings; 33 of these applications were executed. The buildings were to be built in accordance with market requirements, in contrast to earlier TPG architecture, which had been tailor-made for the company's activities. A modular system was developed for the erection of clean-cut glass-paneled boxes in various sizes and floor plans. Originally, each building was to contain more than one company, in the then-fashionable shop-in-shop concept. Furthermore, these buildings would be partially located in residential areas, which severely restricted the use of regular commercial signage. In order to represent the different logos, I developed a fragmented visual language in line with the research done for the "comic strip" multiple sign mentioned above. The material consisted of retroreflective prismatic foil that created a dramatic day-and-night effect. In the end, TPG turned out to be the only party to use the buildings. Each location has a different design applied to it.

Hofbogen project

The Hofpleinlijn viaduct is a defunct elevated railway bridge in Rotterdam constructed around 1900. After the bombardment of the city center in 1940, the arches of the bridge were closed off and used to house businesses and even families who had lost their homes. As a result, the part of the city where the bridge stands has been divided by a

van logo's die niet alles meteen verraden maar eerst nader bekeken, bestudeerd en vertrouwd moeten worden. Het is net als een prachtige kerstboom, en meteen zeer betoverend.

Twee contrasterende projecten

S.T.I.P. (System Typography Integrated Program)

Het project S.T.I.P. was een architecturaal en monumentaal huisstijlprogramma dat moest worden toegepast op circa 110 gebouwen van de toenmalige TPG Post; 33 werden er uitgevoerd. De gebouwen moesten volgens marktvereisten geconstrueerd worden, dit in tegenstelling tot eerdere gebouwen voor TPG, die

IMAGE / AFBEELDING / صورة
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specifiek voor het bedrijf waren ontwikkeld. Voor het oprichten van eenvoudige glazen boxen in verschillende afmetingen en grondplannen werd een modulesysteem ontwikkeld. Oorspronkelijk zou elk gebouw meerdere bedrijven huisvesten, volgens het destijds in zwang zijnde 'shop-in-shop'-concept. Bovendien zouden de gebouwen deels in woonwijken gesitueerd worden, met de strikte beperkingen voor beletteringen van dien. Om de verschillende logo's te kunnen gebruiken ontwikkelde ik een gefragmenteerde beeldtaal die aansloot op het onderzoek dat ik voor het bovengenoemde 'stripverhaal' van meerdere panelen had verricht. Het materiaal bestond uit reflecterende prismatische folie dat een dramatisch dag-en-nachteffect creëerde. Uiteindelijk bleek TPG als enige partij de gebouwen te gebruiken. Op elke locatie werd een ander ontwerp toegepast.

Figure 44. Simultaneous solo-script bilingual book page, Including the English (left column) and Dutch (right column) languages written in Latin script. The page can be found in Typographic Matchmaking in the City, p. 74. Copyright © AbiFarés 2001.

4.2.3.b. Simultaneous bi-scriptual bilingual layout

This section focuses on the juxtaposition of two languages that share two distinct scripts, such as English and Arabic. Both languages present concurrently with the same overall composition. For example, the bilingual logo design (Figure 45), and the bilingual restaurant menu (Figure 46) are simultaneous bi-script bilingual typography. Each script in English and Arabic, uses a different script and both present consistently, statically and simultaneously.



Figure 45. Simultaneous bi-script bilingual sign 'GENERAL HEADQUARTERS' ' القيادة العامة ', including Arabic and Latin scripts.



Figure 46. Simultaneous bi-script bilingual menu at an Iranian Restaurant called Manoush. Copyright © Manoush Restaurant.

4.2.3.c. Asynchronous Mono-scriptual Bilingual Layout

The section features the presentation of message/s in two languages as part of one artefact[166]. The two languages share the same scripts; the message in one language is shown in the absence of the other language; or each language is presented in a different layer. The examples include bilingual film credits, where the second language appears after the first language has been faded out. Also a bilingual double-sided flyer is static, but the message in one language is shown at the front and the message in the other language at the back; or a bilingual website where a different page is assigned to present the second language (Figure 47).

[166] A 'composition' would be a single layout, visible within one frame. An artefact would be a whole object that might contain multiple pages/frames/compositions.

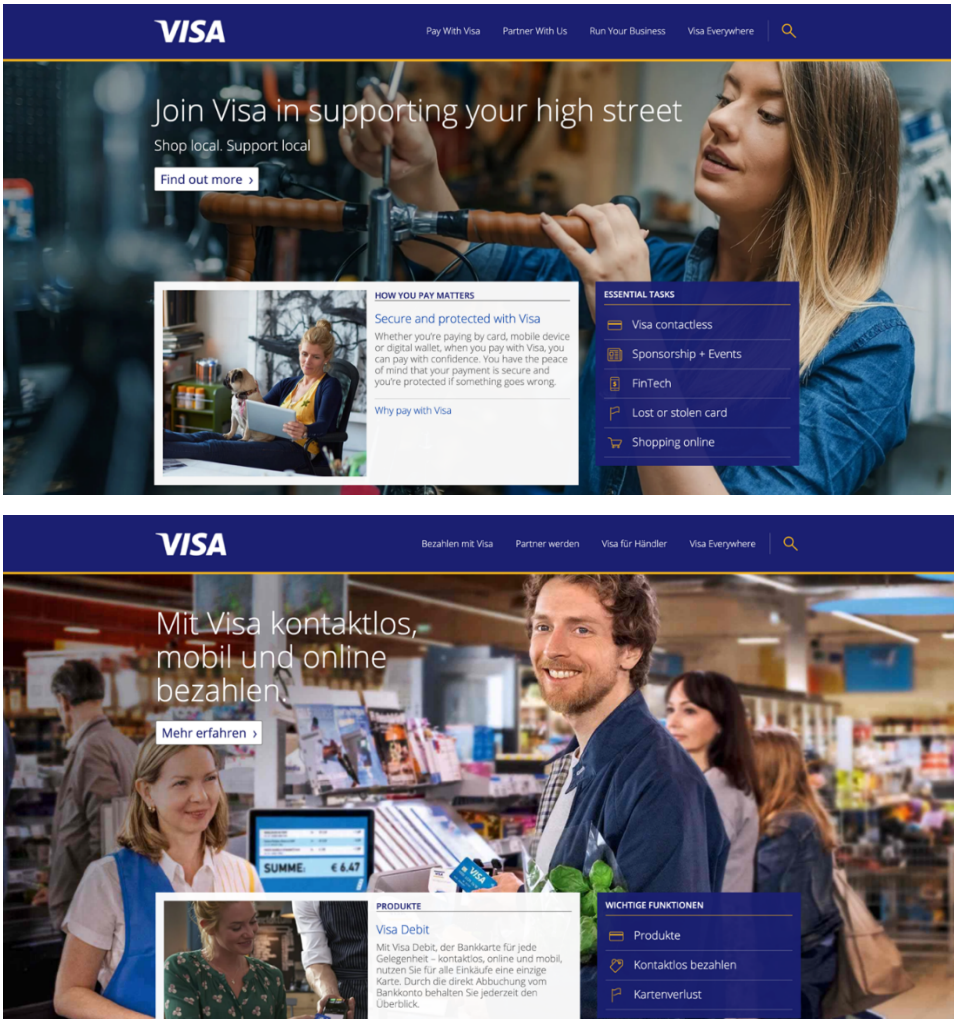

Figure 47. Visa Website. Asynchronous solo-script typographic composition in English and German.

4.2.3.d. Asynchronous bi-scriptual Bilingual Layout

Illustrated is the presentation of a message/messages in two languages as part of one artefact. The two languages share distinct sets of scripts. The message in one language is shown in the absence of the message in the other language, or each language is presented on a different layer. The example shows a bi-scriptual Latin and Arabic website in Figure 48.

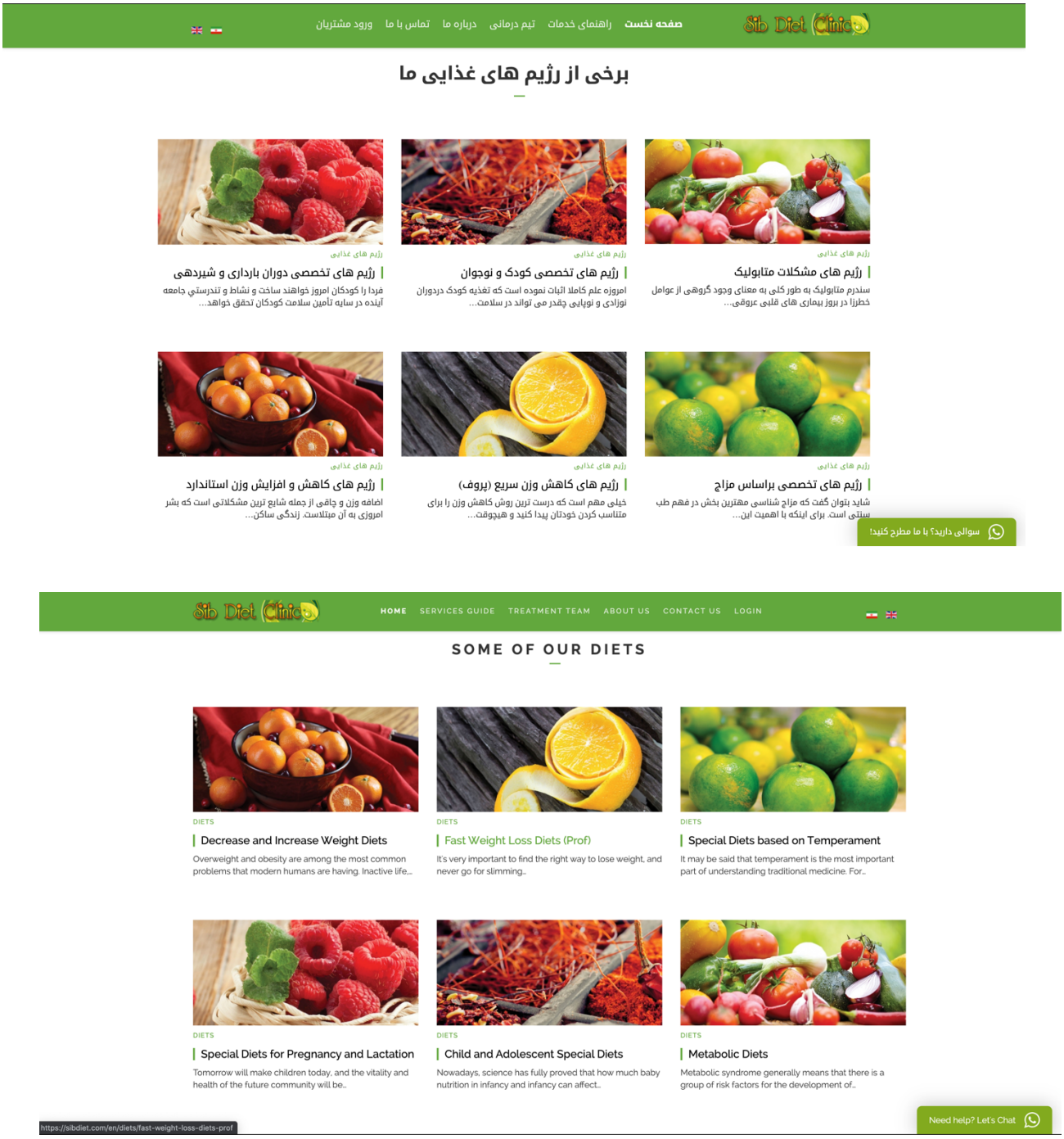

Figure 48. Sib Diet Website. Asynchronous bi-script typographic composition.

4.3. Analysis of context in Bilingual Typographic Approaches

4.3.1. Analysis of context via Lingual Approaches

Observations and analyses in Istanbuland London show bi-scriptual Latin and Arabic typographies including different methods of written presentation of a message. For simple communication and understanding, I use the term '*lingual presentation*' to refer to '*written presentation of a message*'.

In accordance with my observations, lingual presentation, by means of different typographic objectives could be divided into two subcategories, including '*phonetic presentation*' – transliteration, and '*translated presentation*' – translation.

4.3.1.a. Phonetic Presentation or Transliteration

Analysis of shop signs in London's Edgware Road (section 5.1.2.) shows that a message in Arabic may present phonetically in Latin due to heritage and cultural bias. The linguist and author, Florian Coulmas (1989), commented that "foreign proper names are not usually translated but represented phonetically". An example of this approach can be seen in Appendix 4, Photo L. 35, with the, 'محل' in Arabic presented as 'mahal' in Latin. Samples of the phonetic approach are also ubiquitous, in bi-scriptual Latin and Arabic logo designs (Figure 49). Research (Odeh, 2020) suggests the necessity of taking care with the meaning of phonetic translations in the second language to avoid accidental offensive meanings[167].

[167] As part of my career working with London-Iranian business owners, I observed that local businesses usually present their business names phonetically in Latin and Arabic scripts. In this case, they usually selected a meaningful name in the Persian language and presented it phonetically in the English language, using Latin script to demonstrate the exact pronunciation of the Persian word. The interesting point is that, in some cases, the pronunciation of a Persian name is similar to the pronunciation of another meaningful word in the English language, which might suggest a negative connotation. Therefore, for designers, cultural awareness of the implications of words and their meanings in different languages is critical.
I was able to establish that a graphic designer may become responsible for deciding a name, especially for start-up businesses, mostly to help new immigrant customers who have less knowledge about the culture of the new country where they have become resident. Designers must be quite careful in selecting a name that is supposed to present phonetically in a different language. Graphic designer and typographer Tareq Odeh, as part of his presentation and speech in 2020 in Amman, Jordan on 'Local-Global Translation in Cultural Identity', demonstrated the phonetically-inaccurate use of the brand 'Cos' in the Arabic language in Arab countries, where tit has a very offensive meaning in the Arabic and Persian Languages. The same happened for the brand 'Kiri'; since the enterprise had a huge market in Arabic countries and their logo was presented phonetically in the Arabic language, in which it has an offensive meaning. The company was obliged to change its name (Odeh 2020).
For regulations on choosing Arabic names for global brands in Saudi Arabia, please refer to Gassas (2016:2).



Figure 49. Three examples of bi-script logo design including Latin and Arabic scripts. In the majority of the bi-scriptual logo designs in Arabic and English where the Arab culture is superior, the Arabic text looks like a calligraphic pictorial icon, while Latin remains as a subheading in sans serif style. Copyright © Arlisalah, Al-Tibyan Centre and Arjan.

4.3.1.b. Translated Presentation

Alternatively, the Latin may present as a translated equivalent of the Arabic name, such as in Photo 2, where 'صيدلية امير' in Arabic is shown as 'Prince Pharmacy' in Latin. In addition, translated texts may be found in bi-scriptual books or magazines, or in shop windows, such as those in the Edgware Road, for advertising services, and/or in educational training.

4.3.1.c. Critical Analysis of Typographic Challenges by means of Linguistic Presentation

Typographically, different lingual presentations of a message provide different challenges. For instance, the lecturers, graphic designers and typographers Victoria Squire, Friedrich Forssman and Hans Peter Willberg, in their publication on working with Latin script 'Getting it right with type: The 'Dos and Don'ts of typography', commented in relation to a logo design that the style and characteristics of selected typefaces may sometimes comply with the literal meaning of the name (Squire, Willberg & Forssman, 2006). In bi-scriptual Latin and Arabic layouts, the same approach is observed, but the problem is that the literal meaning of a word may have different connotations in different languages or cultural contexts. Furthermore, the phonetic presentation may imply an unexpected meaning in a foreign language due to pronunciation similarities. Therefore, the typeface approaches for a short message or logo design in bilingual typography are not as straightforward as a monolingual approach. More complex issues are involved, according to the lingual presentation of the texts. Another challenge in different lingual presentations is the

unequal amount of text for juxtaposed Arabic and Latin in a translated presentation, particularly in bi-scriptual logo designs (Figure 50).



Figure 50. Left: The Emirates ' الامارات' logo, a map of the UAE and the name Emirates in both Arabic and English (Source: Shutterstock). Right: DUBAI, UAE – JANUARY 2020: The Dubai Police Force General Headquarters ' القيادة العامة ' in Dubai with its logo in English and Arabic (Source: Shutterstock). The glyphs of Arabic script can stretch and make the length of Arabic script shorter or longer. In bilingual logos, since the linear length of Arabic script is shorter compared with the Latin script, usually the glyphs stretch to increase the length of the Arabic script and match it with the Latin counterpart.

The artist, professor and visual designer, Randa Abdel Baki (2013) in her analysis of appropriate layout style for the juxtaposition of Latin and Arabic scripts in Lebanon urban poster designs, commented that the appearance of Arabic script is smaller than Latin text in length. However, analysis of different layouts shows that Baki's observation is not true for all situations.

If a Latin text is presented phonetically in Arabic this may be true since, first of all, the Arabic script system is Abjad: each symbol of the Arabic alphabet stands for a consonant. The readers are left to supply appropriate vowels where they are required (in Latin grammar, both vowels and consonants are provided). Secondly, because the letterforms link together with small horizontal strokes – glyphs – the length of an Arabic word presented phonetically usually becomes smaller than its Latin counterpart. For instance, the name 'Sahar' in Latin has five letterforms including three consonants and two vowels. However, the phonetic form of this name in Arabic is composed of only three letterforms' س ح ر ' because the vowels do not appear. In addition, since the letterforms connect together, the length of the

name in Arabic becomes still shorter: 'سحر'.[168] Due to the nature of translation, sometimes a word in Arabic may be longer than its Latin counterpart: 'Car' in Arabic, for example, is 'ماشين'; while a direction sign for a toilet at airports in some Arabic countries is presented in Latin as 'toilet' and 'دورات المياه ' in Arabic. Due to the nature of translation, the message in Latin script is presented with one word, while the same message requires two words in the Arabic script. This issue is quite challenging in layouts with limited spaces, such as business cards and shop signs[169].

In the analysis of successful graphic design and typography approaches, using a grid is recommended as a structural system for the arrangement of content and to dedicate proportional space for different elements in a layout. The same approach can be observed in bi-scriptual Latin and Arabic layouts, such as shop or road signs, or airport direction signs where equal space is dedicated to English and Arabic. In situations where, due to the nature of translation, one word in English requires more than one word in Arabic, the designer has to compromise regarding the font size of the text, in order to fit it into a dedicated space. This phenomenon causes both inconsistency in font size between juxtaposed Latin and Arabic texts, and inconsistency of font size between the texts of one script. These inconsistencies make one script superior by putting the affected script in a secondary role. It also influences the readability and prompt recognition of a message.

Unequal amount of Arabic text compared with Latin is also a challenge for bi-scriptual Latin and Arabic book and magazine designs, since more space may be needed for one script. In contrast with Baki, the typeface software developer and specialist in non-Latin typefaces Yannis Haralambous (1998) observed, in bi-scriptual Latin and Arabic layouts, how long text Arabic lines are difficult to fit on the page.

The need for more space for one language in the juxtaposition of Arabic and Latin is

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[168] It is evident that in the category of simultaneous solo-script bilingual layout, this context is not so much a challenge as it is in the category of simultaneous bi-script bilingual layout. Because in the phonetic presence of a word in two languages, which share the same script and letterforms, the written form and visual appearance of the word in both languages would be the same. For example, in a phonetic lingual display, the letterforms used to write the name 'Jack' in English and Spanish would be similar; therefore, the written form of 'Jack' in both languages would be the same. However, in literal translation of the name 'Jack' the European spellings might be different. For example, in French it is 'Jacques'. Consequently, this context is more challenging in bi-script bilingual layout where the two languages are written with two entirely distinct scripts with different shapes of letterforms, like Latin and Arabic. For example, the phonetic elements of 'Jack' in the English and Persian 'جک' languages would result in two entirely diverse visual presentations.

[169] We observe the growth of digital shop signs due to the challenge of including all data in a limited space in printed shop signs. Also, recently, QR codes on businesses are replacing oversize details of data on business cards. However, both cases are still limited to monolingual live texts. A QR code may present an image, in which case it is considered the same as a static print layer.

influenced not just by the rules of translation, but could also be affected by the different anatomy of Arabic letterforms compared with Latin and different characteristics of the script. Compared with Latin, Arabic letterforms have bigger counters of more variable body size and descenders, more letterforms encompassing descenders, and more 'titles' – dots – positioned below the baseline.

The modern typesetting Latin letterforms include 'lowercase' and 'UPPERCASE' styles. The lowercase letterforms without ascender or descender, like 'a', 'c', 'e', 'i', 'm', 'n', 'o', 'r', 's', 'u', 'v', 'w', 'x' and 'z' have almost the same 'x-height', They all sit on one baseline and the top of the letterforms to achieve the 'x-height' matrix. There are exceptions for 's' and 'o'. Due to optical disparities of Latin letterforms, the 's' and 'o' are drawn slightly less than a millimetre below the baseline and above the x-height (Samara, 2004). The consistency in the height of Latin letterforms also applies to the lowercase letterforms with ascenders or descenders. For example, the letterforms with ascenders including 'b', 'd', 'f', 'h', 'k', 'l' and 't' all sit on one 'baseline' and achieve the same 'cap-height' within a typeface, therefore the body size of the letterforms with ascenders is the same. This is also true for lowercase letterforms with descenders, such as 'g', 'j', 'p', 'q', and 'y'. In brief, all the lowercase Latin letterforms sit on one 'baseline', all ascenders through the 'ascender line' and all the descenders touch the same 'descender line'. In comparison, Arabic letterforms within a word may sit on different 'baselines'; the letterforms with descenders touch different 'ascender-lines'. In addition, the anatomy of Arabic letterforms includes variable teeth and not all the teeth touch the same x-height.

Moreover, as Baki (2013:28) pointed out: "Arabic script carries a wide range of ascenders and descenders and combines small glyphs and counters that create a smaller appearance in comparison with the length of Latin text."

Following the agreed system of typography rules that there is one specific 'base-line', 'x-height', 'cap-height', 'ascender-line' and 'descender line' (Biggs and Reginald, 1968; Gaskell, 1974; McLean, 1980; Blackwell, 1992; Jute, 1997; Samara, 2004; French, 2006; Rosendorf, 2009; Whitbread, 2009; Kane, 2011; Carter, Day and Meggs, 2012; Tselentis, et al., 2012;) for Latin letterforms; when lowercase Latin letterforms sit together to create a sentence, even if some words may exclude 'descenders' or 'ascenders' because there is consistent 'x-height' and 'body-size' between all letterforms, the overall layout presents neat, consistent and geometric layout. Meanwhile, with Arabic letterforms, due to the undefined and

variable baselines, ascender lines and descender lines (Mesghali, 2015; Zoghbi, 2015), when they sit together in a sentence, the layout becomes fluid and rhythmic. On other hand, within the 'UPPERCASE' style, all the 26 Latin letterforms sit on one 'base line' and achieve approximately the same 'cap-height'. This results in achieving the same 'body-height' for all the 26 letterforms. If the words include uppercase, there is a consistent 'body-size' among all the letterforms which makes it even more geometric and stable.

These differences result in a different grey value and density for Arabic script compared with Latin. In addition, Arabic letterforms consist of variable length and width based on their position in a word, which is in contrast with Latin, which follows the 'M' size for the width of letterforms (Samara, 2004). Arabic script is more calligraphic[170]. There are inconsistent gaps between the disconnected letterforms, with open 'counters' that are drawn below the baseline, compared with the gap between disconnected letterforms that draw above the baseline. For example, if Arabic letterforms sit with one of the six Arabic letterforms that always remain disconnected to following letters (ژ[171], ز , ر,ذ, د, و), extra unarranged gaps remain between them and the following letters. Of course, depending on the anatomy of the following letter and the visual form of the typeface, the gap may vary on different occasions. However, as the illustrator and graphic designer Farshid Mesghali (2015), commented, due to this inconsistency of gaps between Arabic letterforms in different situations, specifically in typographic logo design, designers are expected to apply manual adjustment between the Arabic letterforms.

[170] If we divide the methods of text production into three categories, namely writing, lettering and typography, according to AbiFarès (2001: 118): '"calligraphy' can be seen to exist halfway between writing and lettering".
Balius (2013:82), regarding the change of Arabic calligraphy to typography, states: "With the introduction of the printing press by the mid-fourteenth century in Europe, Western culture had begun to establish a distinction between calligraphy and typography. It seems that the Arabic script is now at the same crossroad. This separation begins to be considered, especially with the design of decorative alphabets (display) where there is more room for interpretation and self-expression. The demand for new display typefaces goes together with the development of the graphic design profession in Muslim countries. The role of typography in graphic design is fundamental to the development of commercial brands and products, and to everything that has to do with the transmission of messages in a world dominated by the media. Technology currently available can be more faithful to the natural forms of Arabic script, regardless of religious issues. This might be the reason why Arabic script reform issues have stopped in the anticipation of an imminent revival of Arabic typography in all senses."

[171] Letterform 'ژ' presents an extra sound in the Persian language, which does not exist in the Arabic alphabet.

4.3.2. Analysis of context based on 'type pattern'

The context I propose in this section is identified through analysis of simultaneous bi-scriptual Latin and Arabic typographic layouts in static environments, including bilingual approaches designed for my company's clients, and the analysis of available bi-scriptual Latin and Arabic approaches as part of primary research and secondary research conducted during the course of this study. A new set of terms for contexts will be proposed in this research, with which I hope to pave the path for mutual communication and understanding in future graphic design and typographic discussions.

4.3.2.a. Body-text layout

According to my observations, the next group of bi-scriptual layouts is dedicated to layouts with body-texts, in which case, the second script usually presents the translated version of the primary script, unless it is a unique name or term within the text presented phonetically. Typographically, bi-scriptual body text layout has different considerations compared with bi-scriptual display layouts. For example, variable text weight for each script is necessary for the majority of cases, since the layouts may include headings, sub-headings and body text. In addition, arrangement of one script may cause issues which do not affect the display layout; and, most importantly, the difficulty of finding corresponding typefaces readable in Arabic body text becomes a challenge.[172]

As McArthur (1992:673); and Vildomes (1963, cited in Kemp 2009:15) point out, the languages could be: "either use[d] separately or in various degrees of code-mixing. Different languages are used for different purposes, competence in each varying according to each factor of register, occupation, and education." Depending on the mix of Latin and Arabic scripts in a body text layout, the bi-scriptual body text layouts could be divided into three categories, namely 'Code-switching', 'Code-mixing' and 'Parallel layout.' These terminologies were first used in the field of linguistics to describe different types of bilingualism[173] (Li and Moyer, 2008), and afterwards appeared in typography presentations

[172] More discussions about the scarcity of corresponding Arabic typefaces with appropriate levels of readability in body-text is available in Chapter 2, Literature Review.

[173] These terminologies were first used by linguists (Li and Moyer, 2008) in describing different types of bilingualism. Apparently, Li and Moyer's terminologies and analyses in the sociolinguistic field influenced the field of typography. According to Li and Moyer (2008:5) in analyses of bilingualism from the linguistics perspective: "Mixing languages in the same sentence, clause, or even word, results in a linguistic phenomenon known as code-switching". Linguistic code-switching has different models; the distinctive key issues are the 'various grammatical constraints', 'structural properties of

created by the typographer and the head of Communication Design at Hong Kong Design Institute, Keith Tam (2017), to describe different situations where two languages or scripts may be juxtaposed in a layout. Ashrafi (2015) used the same terminologies in arguments on bilingual typography including Latin and Arabic, influenced by Tam's work (Figure 51).

Code-mixing: refers to situation where a body text includes a word or short sentence of a foreign language, inconsistent in different parts. In this situation the two scripts simultaneously coexist inconsistently in a sentence or on a line.

Code-switching: refers to situations where a body text includes a long consistent sentence in a foreign language. In this case, each script sits on a different line.

Parallel: refers to the situations where the two languages are shown independently in separate blocks of text juxtaposed to each other.

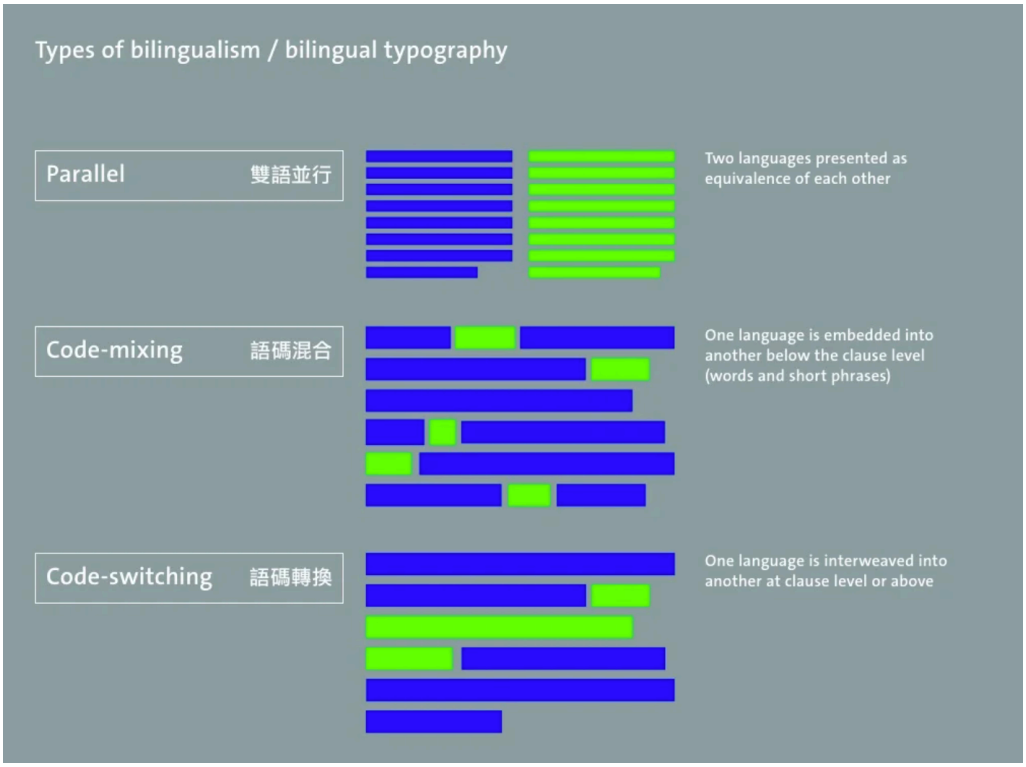

Figure 51. Slide 39 from Keith Tam's online presentation about terminologies in bilingual typography in Hong Kong Case Studies (2017), used for different situations in which two languages may coexist in a typographic layout.

In code-mixing and code-switching, since Arabic letterforms have longer descender lines compared with juxtaposed Latin letterforms, the mixture of these two scripts in a line is

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the languages' or 'the compatibility or equivalence of languages involved'. Li and Moyer (2008) defined code-switching in utterances in a linguist's frame and analysed the brain and the reasons and different occasions when this may happen.

inconsistent in a paragraph, and results in inconsistent unsatisfactory leading between the lines. Leading in code-mixing would be more inconsistent than with code switching, since in code-mixing, there is no rule about where the Arabic may coexist randomly as a word with Latin. However, lines that include just a solo script would have consistent leading. For example, in Figure 52, the top right block of text that includes both Arabic and Latin scripts is unequal. This inequality and inconsistency are also influenced by the choice of the very fluid Arabic typeface Nasta'lique[174]. But the leading is consistently and equally arranged in other paragraphs with the mono-script on the page, obviously because the body-size of all letterforms in a script follow the same typography guidelines.[175]



Figure 52. Sample of combined Latin and Arabic scripts sitting together on a line. Left: the 18th page of De idolatria liber with text in Hebrew, Latin and Arabic. Right top: Sample of online Quran page. Right bottom: The homepage of USAID website.

Co-existence of Latin Numerals and Arabic letterforms in one sentence. USG SYRIA COMPLEX EMERGENCY FACT SHEET #20 - ARABIC TRANSLATION. Copyright *© https://www.usaid.gov/documents/1866/usg-syria-complex-emergency-fact-sheet-20-arabic-translation*

[174] Nasta'lique style has bigger ascenders and consequently needs more leading compared with other traditional Arabic styles.

[175] For more information about the needs for different leading between Latin and Arabic, please refer to Chapter 6, Section 6.3.4.e.

Parallel layout includes messages in body-text. Graphic designer and author Timothy Samara's (2004) discussion concerning 'compensation towards visual disparities of letterforms'[176] becomes a major issue in Parallel layout, since the function and level of readability change when letterforms sit together in a body-text layout to create a sentence, as opposed to when the letterforms are used in larger font size in a display layout (Samara, 2004). In this respect, deciding on an appropriate typeface becomes an important objective with the aim of facilitating readability in the given context. Per David Březina's statements (cited in Wittner et al., 2020:17), it is important to "achieve good readability in the give[n] context."

4.3.2.b. Display layout

A wide range of bi-scriptual Latin and Arabic layouts includes few words or numerals, such as all the samples provided on phonetic display – road signs, street signs, metro signs. In this context, both languages' texts are presented in a display typeface[177]. The message in each language is shown independently in a separate grid, while the design quality of the layout is evaluated according to the whole composition (Figure 53). Influenced by Baki's (2013) discussions and the terminologies she used, I call this group of layouts 'display bi-scriptual layouts'. Given the discussions about 'lingual presentation', a 'bi-scriptual display layout' could include either 'phonetical presentation' or 'translated presentation' of the text.
The function of typographic layout in this context is to deliver a message in limited time due to the possibility that the reader is motion at the time of decoding the message. Therefore the objectives of the layout are legibility, readability and memorability of the data.

[176] In the typographic system of Latin script, one approach to improving the readability of letterforms was compensations for the optical disparities of letterforms (Samara, 2004). Optical disparities deal with the anatomies of letterforms and consider the strokes and anatomies that cause distraction for the eye when the letterforms sit together to create a word or sentence.

[177] Clarified definition of 'display typefaces' is available in Appendix 1, Section AP1.4.



Figure 53. Display bi-scriptual layout.

4.3.2.c. Hybrid layouts

In contrast to Display layout, where each language is present separately, independent of any juxtaposed language, in other contexts which I will term 'Hybrid layout', Latin and Arabic letterforms intertwine to create a new identity, to the extent that each script's letterforms become unreadable in the absence of the other script. Hybrid layout is mostly observed in bi-scriptual logo designs. In Hybrid layout the absence of one script influences the legibility of the message. Thereby, as Ashrafi (2015) describes it, the two scripts are 'diagonally' integrated.

In the majority of bi-scriptual Latin and Arabic Hybrid layouts, strokes from the anatomy of either Latin or Arabic are borrowed to shape both scripts' letterforms. The Latin and Arabic strokes intertwine creatively to create a new identity. The strokes usually play dual roles, one stroke being simultaneously part of the anatomy of both Latin and Arabic letterforms. For example, in the mock-up design for Dubai car number plates (Figure 54), the 'crossbar' and the top part of the right 'diagonal stem' and the 'apex' of the capital letterform 'A' are joined together and become disconnected from the other strokes of the letterform 'A', to demonstrate the Arabic letterform 'د', the first letter for Dubai in Arabic – 'دبی' –. Also the upper 'bowl' of the capital letterform 'B' has been disconnected from the 'stem', and the lower 'bowl' of the letterform 'B' joins the bottom half of the capital letter 'U' – including the bottom half of the left and the right 'strokes' and the 'link' of letterform 'U' – to create the Arabic glyph for 'بی'. In order to complete the Arabic word ' دبی', the dot has been added on the 'counter' of the lower 'bowl' of the 'B' and under the 'U'.



Figure 54. Bi-script typographic composition (Hybrid text). Dubai new car licence number plate. The bottom left presents the old version of car plates in Dubai. The bottom right presents the new version.

Another example of the Hybrid typography approach in bi-scriptual Arabic and Latin logo design (Figure 55) intertwines the uppercase Latin letterform 'Q' and the 'final position' Arabic letterform 'ق'. In this example, the 'bowl' of letterform 'ق' is extended to complete the full 'bowl' of letterform 'Q', and the 'chin' of letterform 'ق' is extended to shape the 'tail' of the letterform 'Q'. It is assumed the logo is aimed to demonstrate the simultaneous coexistence of 'Q' and 'ق'[178]. However, the level of legibility and intuitive recognition of the letterform 'Q' is not as intuitively successful as with the letterform 'ق' .



Figure 55. Bilingual Arabic and Latin Letter Q logo design template. Created by The Generator. Copyright © Shutterstock.

This approach to using the anatomy of letterforms from Latin script to turn t into the anatomy of Arabic letterforms or vice versa, will automatically provide a 'visual map of

[178] 'ق' is the phoneme for the letterform 'Q' or 'gh' in Arabic.

excellence'[179] between the style and stroke's weight and thickness of the letterforms. In some cases, such as the template design for the Dubai car number plate, designers relied on design elements and the use of different colours to prominently display the shared strokes that present the message in the second script. Delivering a message intuitively is an indispensable part of an informative typographic approach.

4.4. Conclusion

To sum up my observations, two issues play an important role in typographic and design decisions with Latin and Arabic: firstly, the 'lingual presentation' of the message, which could be either a 'phonetic presentation' or a 'translated presentation' of the primary text; and secondly, the type pattern is crucial. It could include 'Bi-scriptual Display layout', 'Bi-scriptual Hybrid layout', or 'Bi-scriptual body-text layout'. The Body-text layout itself may be divided into 'code-mixing', code-switching or 'parallel layouts' (Diagram 4).

<table>
<tr><td rowspan="2">Lingual Display</td><td colspan="2">Phonetic Presentation</td></tr>
<tr><td colspan="2">Translated Presentation</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td rowspan="5">Type Pattern</td><td rowspan="3">Bi-scriptual Body-Text Layout</td><td>Code-Mixing</td></tr>
<tr><td>Code-Switching</td></tr>
<tr><td>Parallel Layouts</td></tr>
<tr><td colspan="2">Bi-scriptual Display Layout</td></tr>
<tr><td colspan="2">Bi-scriptual Hybrid Layout</td></tr>
</table>

Diagram 4. Analysis of context for bi-scriptual Latin-Arabic typographic layouts. ©: Sahar Khajeh - 2023

Both categories of 'lingual display' and 'type pattern' may overlap. For example, a title message presentation could be a phonetic display or could be a translated lingual display. With respect to the decision-making process in applying relevant typographic elements to a bilingual layout, there might be confusion with all of the above-mentioned factors, which also include achieving appropriate grey value, density, balance and equality between juxtaposed Latin and Arabic scripts; readability; and the relationship between the type

[179] The term 'visual excellence' was first used by AbiFarès (2010), to describe the high visual quality of the system of Arabic calligraphy. However, I prefer to take the term and improve the notion within the field of bilingual typography.

composition and the intended audience. Consequently, decisions about appropriateness of applied typographic elements have been influenced by the nature of bilingual typography and the categorisation within the field of bilingual typography, rather than by strict application of typography rules in each context.

Different categories within the field of bilingual typography – solo-script or bi-script, static or temporal environment, and simultaneous or asynchronous bilingual layout – whether if there is a need for achieving a visual map. For example, in solo-script bilingual layout, the designer does not need to worry about the difficulty of elaborating a visual map between the letterforms, since both languages share one script. Therefore, the typographer can easily achieve a visual map by applying the same typeface for both scripts. However, achieving a visual map within a bi-script bilingual layout is challenging, because, for example, for the juxtaposition of Latin and Arabic scripts there is a lack of bi-script typefaces with appropriate levels of visual map for different contexts. Therefore, the context the typographer has to find the mapped typefaces for depends on the function of the bilingual layout.

In addition, the categorisation of the field of bilingual typography specifies the level of relationship between the audience and the typographic layout. The reason is that the two factors of stability or movement of either the text or the audience result in differing functions of typographical elements within a bilingual layout. This means the principles of bilingual typography would be different in a static environment compared with the temporal environment where the factor of 'movement' adds a layer of 'behaviour' to the function of letterforms. Therefore, typographers have to consider a totally distinct set of principles in a static environment, compared with those for a kinetic environment. However, the categorisation of contexts within the field of simultaneous bi-script bilingual layout controls the level of each of the factors above, for example, when, based on the '*bilingual field of study*,' it turns out that a visual map between the letterforms is required, since the bilingual layout includes the simultaneous juxtaposition of two distinct scripts. Thus, the context determines to what extent the visual map is essential. If it is based on the context, the message is presented in body-text within which readability of the type is important, so then a different level of relationship between the Arabic and Latin scripts is required.

The analysis demonstrates that a good knowledge of the anatomy of letterforms paves the

way to achieving a more effective visual map between the Latin and Arabic scripts, specifically in ‘hybrid layouts’ where the letterforms break down and the anatomies of both scripts intertwine to create a whole identity; and in kinetic typography.

Chapter 5: Analysis of Nomenclatures and Anatomy of Letterforms

5.1. Introduction

As Samara (2004) pointed out, the individual forms and interactions of alphabetic characters are key to understanding and working with typography. A good knowledge of the anatomies of Latin and Arabic letterforms provides a better understanding of each script's culture, and insight as to what extent manipulation of letterforms may influence their readability and legibility. Although this is more necessary for practitioners of bi-scriptual typeface design, it is also essential for the arrangement of texts. As analysis of primary research and analysis of context in previous chapters shows, understanding the anatomy of letterforms is a necessary skill for working with body-text display and hybrid layouts: understanding the anatomy of letterforms, and the role of each stroke in terms of legibility of the letterform and determining the appropriate level of leading for each script. As relevant literature shows and as discussed in the previous section, using Latinised Arabic typefaces that might help give a consistent approach for descenders of Arabic which would also help achieve consistent short leading between juxtaposed Arabic and Latin texts, is inappropriate, since it reduces readability of the Arabic script, as it includes more letterforms with descenders than Latin. Furthermore, the size of Arabic descenders is variable, for instance ' ع ص س ر ح ق ل م ن و ي.' Thus, Arabic script typographic matrices include variable descender lines, while Latin Script includes just one descender line, since all the descenders 'g', 'j', 'p', 'q', and 'y' have almost equal length.

So the anatomy of Arabic script comprises variable undefined different shapes, which, if they become simple and geometric, lose their legibility. In Latin, just 5 out of 28 letterforms are drawn below the baseline; 'p' and 'q' share the same visual shape of stem in their

descenders, while those of the remaining three have different visual forms, ‘g’, ‘j’ and ‘y.’ Therefore, sitting all Latin letterforms on one ascender line would not interfere with the intuitive recognition of each letterform. However, my analysis shows, more than half of the final position of Arabic letterforms, 18 out of 28, are drawn below the baseline, including ‘ی و، ن م، ل، ق، غ، ع، ض، ص، ش، س، ز، ر، خ، ح، چ، ج’. In total, these eighteen letterforms share six different-sized and -shaped descenders.

The letterforms ‘ق، ض، ص، ش،س، ل’ and ن share the same bowl shape. ‘ خ، ح، چ، ج’ share the same visual form. Furthermore, ‘ز، ر’ and ‘و’ also have similar structures and forms, while

‘ غ، ع’ are categorised visually in a different group, and ‘ ی، م’ both present a different descender anatomy. Using a Latinised and simplified Arabic typeface with one or only few descender lines for these eighteen letterforms is, therefore, a severe obstacle to intuitive recognition of letterforms within a word (Figure 56). Moreover, in the Arabic, strokes are drawn below the baseline. In some cases, such as the four forms of ‘چ، پ’, there are dots below the baseline. Therefore, using typefaces such as Tahoma that assign consistent descender lines for the final position of these letterforms does not provide enough space for the dots and reduces readability in smaller font sizes, causing overlapping of dots and strokes. The point is that the lack of designers’ knowledge of the anatomies of Latin and Arabic letterforms and their differences results in decisions to use inappropriate typefaces that may be aesthetically pleasant but are not functional.



Figure 56. Different anatomy of descenders in Arabic script. This text using Arial typeface shows six different forms of descenders with five different descenders heights.

For display layouts, deciding on appropriate typefaces always involves consideration of the different shapes of letterforms, since the shapes of counters and optical disparities f will play an important role in the overall design. In addition, decisions about manual manipulation of kerning for letterforms, with wider counters, as discussed in the literature

review, needs a good understanding of letterform anatomy. It helps to identify to what extent manual manipulation of a letterform may influence readers' visual experience of the script and whether it will suit local taste.

Understanding the anatomies of letterforms in hybrid layouts is obviously important, since creativity in this context relies on identifying visual similarities between the strokes of the intertwined letterforms of Latin and Arabic, as well as understanding how readers will recognise letterforms in an intertwined or manipulated display. In addition, as we saw in Section 3.2.3 and the literature review, in a bi-scriptual layout, similarity of shapes of letterforms or numbers may cause confusion and misunderstanding. For this reason, designer familiarity with the anatomies of letterforms will help to avoid mistakes.

As the literature review shows, designers of digital environments and typefaces have attempted to propose new rules or matrices for Arabic scripts in juxtaposition with Latin. Their aim was either to improve recognisability of Arabic scripts in dual digital texts or to improve harmony. It is beyond the scope of this study to analyse the role of anatomies of letterforms for the practice of bi-scriptual typeface design, but the outcome of this chapter may nevertheless be of benefit.

Consequently, this chapter analyses the anatomies of Latin and Arabic letterforms to pave the way towards achieving solutions for the issues mentioned above. The chapter also aims to identify the gaps in the anatomies and nomenclatures of Latin and Arabic to demonstrate their effect on developing the design quality of juxtaposed Latin and Arabic scripts.

5.2. Methodology

Initial research, investigating the prominent typographic sources available in either the Persian or the English languages (AbiFarés, 2001; Mesghali, 2015; Zoghbi, 2015) revealed a clear lack of analysis and understanding of anatomy of letterforms and that there is no standard nomenclature system for Arabic script; so the decision was made to undertake a comprehensive survey of the nomenclature of Latin letterform anatomy with a view to creating a proper nomenclature system for Arabic. However, the results of my survey of popular texts on Latin typography (McLean, 1980; Samara, 2004; Ambrose and Harris, 2006;

Carter, Day and Meggs, 2012; Haley et al., 2012) found no single agreed set of terms for Latin nomenclatures. This suggests that there are two gaps to be found here. First, nomenclature for the anatomy of Latin script are inconsistent. Secondly, there is no proper methodology to present the illustrations and definitions of the anatomy of Latin letterforms. To sort and collate the data, 204 typography books at the British Library and the University of Hertfordshire Learning Resource Centre (LRC) related to Latin script were surveyed, resulting in the identification of further differences and contradictions in the anatomy of Latin script. Of these, 44 sources consist of deeper analysis of the anatomy of Latin letterforms and nomenclatures and were selected for further analysis[180]. Certain issues became apparent after a great deal of analysis, including inconsistent nomenclatures to describe the anatomy of Latin script. Furthermore, the method that extant sources use to display the current Latin nomenclature system does not assist in understanding the anatomy of Latin letterforms and nomenclatures. Researchers claimed (Samara 2004:25) that the anatomy of Latin letterforms has a defined structure, but the current method of demonstrating the nomenclatures within the current sources does not help to understand the structure of Latin letterforms. Moving on to Arabic scripts, analysis of the resources describing their anatomy proves that the Arabic nomenclature system needs extension, and the anatomy of Arabic script has not been fully analysed.

5.3. Analysis of anatomy of Latin letterforms

Joseph Moxon, the author of 'Mechanik Exercises' (published in 1683), has been cited (Shaw, 2014) as the first to introduce nomenclatures for the anatomy of Latin letterforms. He defined nine specific terms relating to the face of type as part of his debate on punch cutting, which include: topping, footing, bottom-footing, stem, fat-stroaks, lean stroaks[181], beak of letters, tails of letters and swash letters (Moxon; 1703, 126-127). According to Shaw (2014), Moxon ''defines topping as "the straight fine stroak or stroaks that lie in the top-line

[180] The lists of the 204 and 44 are available on request.

[181] Old-English spelling used in this text. The spelling 'stroaks' has been replaced in modern English with 'strokes'.

of ascending letters [...]"; footing as "the straight fine stroak or stroaks that lie in the foot-line of letters, either ascending or descending"; and the beak as "the fine stroak or touch that stands on the left hand of the stem." 'Topping and footing' refer to bracketed head and foot serifs. 'Beak' refers to 'angled' head serifs. Moxon's nomenclature does not match contemporary versions, and none of his forms is illustrated.

Joseph Thorp[182] is *de facto* the pioneer in illustrating Latin letterforms. However, although dealing with, for example, the description of serifs and terminals in considerable detail, he (1931, 18-19), missed out definitions of some essential terms, such as 'stroke' and 'tail' (Figure 57). So Thorp's illustrations, although pioneering, failed to be comprehensive.

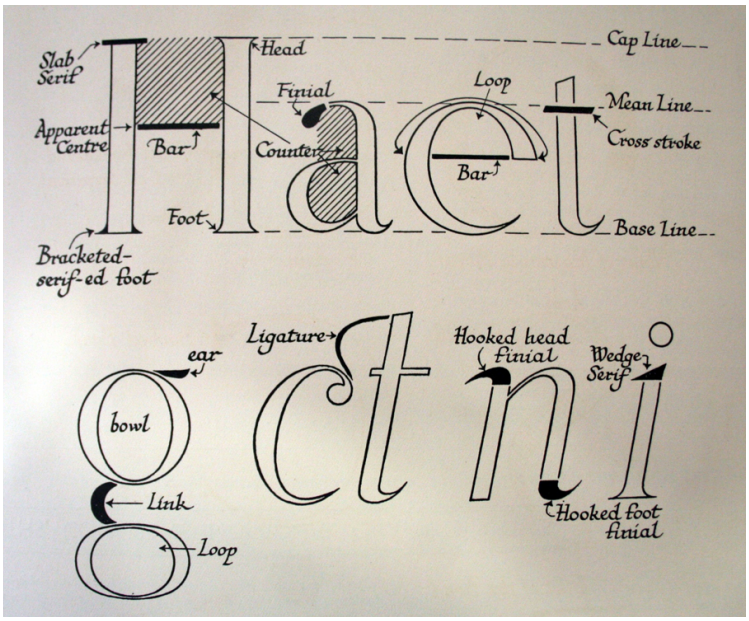

Figure 57. Latin Nomenclature provided by Joseph Thorp (1931).

Confusingly, The British Standards Institute's (1967 – cited in Shaw, 2014)[183] nomenclature used parts of metal type, like bevel, face, beard and nick. In addition, some terminologies used to refer to the visual anatomy of letterforms like serif, ascender, descender and counter are introductory terminologies. According to Shaw (2014), "clearly the terminology of letterforms was not a major concern to typographers in the 1960s, including some of the best of the time." What Shaw discussed was generally accepted 'in Britain in 1974' and

[182] Towards a Nomenclature for Letterforms (Thorp, 1931).
[183] In their publication *BS 2961: 1967 Typeface Nomenclature and Classification.*

'must have been based on oral tradition' (Shaw, 2014). It is interesting that this issue is also the case with Arabic script. There is an oral tradition for Arabic type that has not yet been recorded (Mesghali, 2015).

As Shaw observed, there is no discussion of the anatomy of letterforms in the revised editions of mid-2th century publications in such as those of Simon (1954), Burns (1961), Ruder (1967), Dair (1967). However, Biggs (1968: 22-23) devoted a single page of his book to defining the terminology of some Latin Letterforms. Hand-drawn letters, rather than a specific typeface, and amalgamated serif and sans serif characters were used. The terms provided are not adequate to describe the whole anatomy and, in some cases, they are even confusing. For example, as Shaw (2014) observed: "the sheared terminal is included but not the lobe terminal or ball terminal; and counter and bowl are indicated to be one and the same thing" (Figure 58).

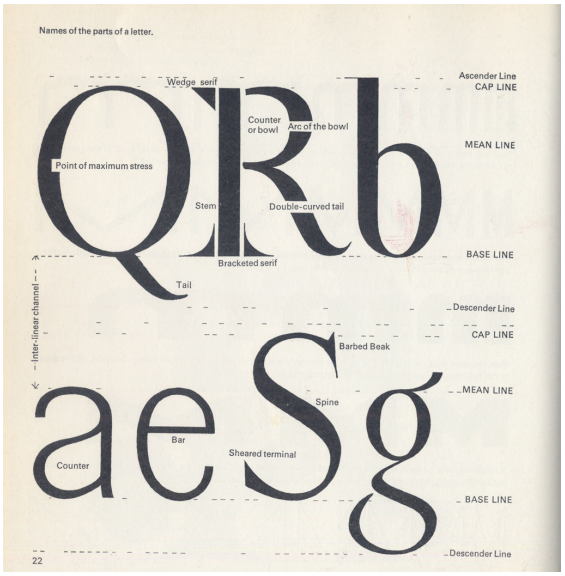

Figure 58. Latin Nomenclature provided by Biggs (1968).

Nowadays, typographers pay more attention to the anatomy of letterforms. Many typography books some dedicate a section to it, since it is an inevitable part of understanding typography. However, looking more recently, first, the list of terms used by typographers to describe the broad anatomy of Latin letterforms differs from one source to another. For example, although according to some (Ambrose et al., 2006:259; Carter et al., 2012: 32; Haley et al., 2012: 321) 'arm' refers to diagonal or horizontal strokes open in both,

or on one side; but Samara's (2004: 16) and McLean's (1980: 74-76) nomenclature systems exclude the term 'arm.' Some of those mentioned above (McLean, 1980; Haley et al., 2012) also claim the horizontal stroke of the lowercase 'e' is called a 'bar'; yet, according to Samara (2004), Ambrose et al., (2006) and Carter et al., (2012) the anatomy of Latin script excludes the term 'bar.'

Secondly, there is inconsistency in illustrations and definitions of the Latin nomenclature system in the existing sources. From analysis of the 44 sources, 179 different terms were used to describe the anatomy of Latin Script, but they do not describe 179 different letter parts: there is overlap in the definition of some terms, which means also that multiple terms are used with identical or similar definitions. For example, some sources use 'crossbar,' some use 'bar' and others use 'cross-strokes' to describe the same thing: horizontal strokes (Blackwell, 1992; Gordon, 2001; Cullen, 2012; Hand, et al., 2013). In this case, according to Blackwell (1992:164), 'crossbar' is 'the horizontal stroke in 'A', 'H,' and for 't,' also known as a 'bar' or 'cross-stroke.' So terms might be equivalent to one another In comparison, some distinguishing between 'crossbar,' 'bar' and 'cross-strokes,' (meaning horizontal strokes divided into different groups based on openness and closedness of the horizontal stroke). In this case, 'bar' mostly refers to horizontal strokes which are closed on both sides, like 'e' and 'A'; 'crossbar' is mostly used to describe those which are open on both sides like 't,' 'f' and 'T'; and 'arm' is mostly used to refer to those which are closed on one side and open on the other, such as the upper horizontal strokes of 'E,' the upper diagonal stroke of 'K' and the right diagonal stroke of 'Y.' (Biggs et al., 1968; McLean, 1980; Squire et al., 2006). As a result of the 'closed' notion and slight differences between the horizontal strokes, there is a lot of overlap in use, which results in omissions in some sources and a great deal of confusion. For instance, according to Sidles (1999: 36), the horizontal stroke of capital 'T' is called a 'crossbar,' while according to Carter et al., (2012: 32-33), it is the 'arm.' In another example, what Haley et al. (2012) and McLean (1980) called the 'bar' is defined as the 'crossbar' by Ambrose et al. (2006). This phenomenon also appears in the definition of the term 'arm.' And while Ambrose and Harris (2006) declared the 'arm' to be ' "a horizontal stroke that is open at the one or both ends like horizontal strokes of capital letterforms 'F' and 't'", Strizver (2014) and Cullen (2012), both believe that 'the arm is an upper horizontal or

diagonal stroke that is attached on one end and free on the other', like the upper horizontal stroke of capital letter 'E'.

Finally, in some cases, strokes of the same nature are differently named based on their position within a letterform. For example, according to Calonaci (2016), the upper and middle horizontal strokes of 'E' are called an 'arm,' but the bottom horizontal stroke of 'E' and the horizontal stroke of uppercase 'L' are called a 'leg.' Meanwhile, according to Blackwell (1992:164) and Haley et al., (2012: 321), all the horizontal strokes of the letterform 'E' and the horizontal stroke of the letterform 'L' are called 'arms'. This phenomenon is also observed in describing the diagonal strokes of the letterforms' 'K'. For example, Haley et al., (2012), Kane (2011), Squire et al., (2006) and Tselentis (2011), used the term 'leg' to refer to the lower diagonal stroke of the letterform 'K,' while the upper diagonal stroke is called the 'arm.' Also, in different sources, the right diagonal strokes of the letterforms 'V,' 'W,' 'X' and 'Y' are called the 'arm', while the left diagonal strokes are unnamed. (Romano, 1984; Ambrose et al., 2006; Kane, 2011; Tselentis, 2011; Gonzales Crisp, 2012; Haley et al., 2012).

Having identified these inconsistencies, I chose to conduct an extensive survey of the ways in which anatomy is described in the available typography texts. As a result of the survey of the 44 sources, it is important to identify in total, how many different terms are used to describe the anatomy of Latin Script, and which anatomies are described with different terms/nomenclatures in different sources. Also, what terms/nomenclatures are used in different sources to describe different anatomies? Which terms also have a specific definition alongside the visual demonstration of it and which ones are left without an explanation or visual demonstration? In how many different ways has the anatomy of Latin letterforms been analysed? And how has the nomenclature system of Latin script changed over time, based on the bibliographical details of the sources?

I created a separate chart (Diagram 5) for each single term to record: first, the way in which each single term was presented in different sources, and whether a single term has different definitions in different sources; secondly, how many sources used similar terminology to describe the anatomy of letterforms, and also, whether the same term refers to the same or a different part of a letterform. For example, only 21 of the 44 sources used the term 'bar',

while the term ‘arm’ was present in 31. Moreover, only nine sources used the term ‘cross-stroke,’ but ‘crossbar’ was mentioned in 26. In some cases, ‘bar’ and ‘cross-bar’ refer to the same stroke, while in others, they are used to define a different part of a letterform. Furthermore, the survey identified some cases where a specific part of certain letterforms remains undefined.[184]

As a result of completing the survey, first of all, there appears to be little thought put into the way the existing nomenclature system is presented. The reason is that with the current system of demonstrating the Latin nomenclature, it is difficult to understand the function of each stroke and how each letterform is divided into different parts. Secondly, currently available sources include inconsistent nomenclature of Latin script, which causes contradictions in illustration, and diverse definitions of a single term within different sources.

A clear understanding of the anatomy of letterforms is very important, since in order to either create a new proper system of metrics for designing a bi-script typeface including Latin and Arabic scripts, or to use the new system of metrics to identify corresponding Latin and Arabic typefaces to be used in a simultaneous juxtaposition of Latin and Arabic scripts, it is important to understand the effect that a shape of letterforms has on determining the descender or ascender heights. In this regard, not only the visual shape of the stroke is important to distinguish one letterform from another, but also the ratio and thickness of the stroke compared with the other components of a letterform become important. In some cases, reducing the height of descenders reduces the legibility of letterforms. Therefore, with this issue that within the current method of demonstrating the anatomy of Latin letterforms, it is difficult to understand the function of each stroke. It is also difficult to understand how the anatomy of letterforms is divided into different structures This constitutes a barrier to developing a system of metrics for the purpose of developing the typography quality of juxtaposed Latin and Arabic scripts.

My analysis shows, that in some cases, the lack of a uniform and effective method of visual presentation of the terms leaves the reader in a state of ambiguity. For example, some

[184] It is beyond the scope of this research to propose solutions for nomenclatures, a task which could require future research at post-doctorate level. to propose a proper solution for nomenclatures.

sources include description sections without any visual presentation (Haley, 1998; White, 2002); while in other sources, the descriptive section has additional terms to compare with their visual section (Haley et al., 2012). The need for a visual section for the definition of terms should be an inevitable part of a nomenclature system. First of all, the precise definition of each term helps the designer to discuss typography comprehensibly and unambiguously, which results in more transparent communication. Secondly, it is an excellent aid for users to understand why a specific part of a letterform is called by a particular term. The problem in this respect sometimes includes the lack of definition of terms (McLean,1980; Samara, 2004; Baines et al., 2005). Secondly, the glossary section of some sources describes only a few terms and has no overall definition for the whole nomenclature system that is presented visually within the same source (Biggs et al., 1968). Furthermore, it seems crucial to give the illustration of one term alongside its definition, which – out of all 44 sources – is only considered by Ambrose et al. (2006). In brief, a different visualisation method has to apply, which includes illustrations and definitions side by side.

From my analysis, in defining the anatomy of Latin letterforms, using a descriptive method to present their structure and an explanation of how the structure affects dividing each letterform into different parts, would pave the way towards a better understanding of the function of each stroke. As Carter (2012), mentioned, ‘‘one of the aims of providing a nomenclature system is to understand the structure of letterforms”. Therefore, the anatomy of letterforms must present the variety of linear forms that create the complete Latin letterforms; thus clarifying what linear forms sit together to create a whole letterform. This would make it easier for the reader to understand how the nomenclature system applies to defining each stroke. For example, as Samara (2004) points out, capital Latin letterforms are categorised into four different groups according to their archetypal structures, including:

- letterforms which are made of horizontal and vertical lines, such as: E, F, H, I, J, L, T;
- letterforms which encompass diagonal strokes, such as: A, K, M, N, V, W, X, Y, Z;
- letterforms with circular shapes, including C, D, O, S, P, U, Q;
- and those which are made of vertical, diagonal and circular lines, including B, G and R.

Expanding on Samara's analysis, it may work better if the hierarchy of presenting the nomenclatures is based on the differences in the shapes of strokes, rather than alphabetical order. I believe the generally-existing alphabetical hierarchy leaves users with ambiguity about applying the archetypical structure of the Latin letterforms. For example, why are the horizontal strokes in the letterforms, 'E,' 'T,' and 'L'respectively called 'arm,' 'bar,' and 'leg'? (Haley, 1998; Ambrose et al., 2006; Haley et al., 2012), although, as mentioned earlier, some sources refer to all strokes as 'arm.' The point is that organising the nomenclature based on the shape of a stroke provides a platform for audiences to effortlessly distinguish and compare similar strokes and nomenclatures.

However, Samara's system is limited to uppercase letterforms (Figure 59); therefore, extensive research is required to analyse lowercase letterforms.



Figure 59. As Samara (2004:14) discussed, the archetypal structure of Latin capital letterforms has evolved and remained consistent over the last 2000 years. It includes a defined system of straight, vertical, diagonal and circular lines. There is no such approach and analysis for the anatomy of Arabic scripts. Image © Samara 2004.

Nevertheless, as a prototype sample, the linear structure of Latin uppercase letterforms introduced by Samara inspires me to divide the current 179 nomenclatures used in the 44 typographic sources into eleven groups, based on the shape of strokes that each term describes. Groups one, two, three, four, and six of my categorisations are devoted to terms that refer to strokes with similar linear forms, including straight vertical, horizontal diagonal or circular lines. Group five includes the terms that define the blank spaces within a letterform, rather than the strokes. Groups seven and eight identify the terminals and serifs. Group 10 describes the terms that rely on the relation of the stroke to the baseline, such as 'ascender' and 'descender,'; and finally, group 11 includes the terms that describe dots and accents. All this amounts to a voluminous investigation and analysis in order to document

the current Latin nomenclature system; the results, including all the quotations and illustrations from the 44 sources relating to the Latin nomenclature system have been documented.

The results of this research will demonstrate that such a new method of presenting the anatomy of Latin script would, by extension, facilitate the development and presentation of a nomenclature system for Arabic scripts, leading towards a better understanding of every single stroke within a letterform; and how the shape and size of each stroke affects defining the typographic metrics, particularly for use with a bi-scriptual, bilingual layout.

GROUP 1
Arm
Lower Arm
Center Arm
Bar
Crossbar
Cross stroke

GROUP 2
Stem
Main Stem
Vertical Stem
Main stroke
Straight Stroke
Stroke
Thin/Thick
Hairline
Thick Vertical Stem
Thin Vertical Stems
Character origin

GROUP 3
Legs
Tail
Open Tail
Loop Tail
Double Curved tail

GROUP 4
Bowl
Curved Stem
Arc of the Bowl
Flat of the Bowl
Arc
Arc of Stem
Shoulder
Branch
Loop
Spine

GROUP 5
Counter
Aperture
Eye
Single Story
Double Story
Second Story
Crotch
Nested
Sidebearing

GROUP 6 Terms
Link
Joint
Juncture
Ligatures
Stylistic Ligature
Discretionary Ligature
Lexical Ligature
Diphtong
Bracket
Fillet
Release
Waist

GROUP 7
Terminal
Acute
Concave
Convex
Flared
Grave
Hook
Hooked foot
Hooked head
Pointed
Sheared
Sheared Terminal
Straight
Tapered
Bracketed serif
Ball
Pear-shaped terminal
Ball Terminal
Finial
Beak
Barb
Barbed Beak
Flag
Swash
Swash Caps
Teardrop
Chin
Lower Beak
Upper Beak
Ear
Spur
Throat
Beginning
Full bracket serif terminal
Terminated Thin Stroke

GROUP 8
Serif
Hairline serif
Straight Serif
Slab Serif
Foot serif
Head Serif
Wedge serif
Wedge Slab Serif
Bracketed Concave Serif
Bracketed (Egyptian)
Adnate
Hair Serif
Hairline Slab Serif
Unbracketed Serif
Abrupt
Bracketed Serif
Spur Serif
Flared ends
Rolling Serif
Round Serif
Vertical Serif
Victorian Fancy Serif
Bilateral Serif
Unilateral Serif
Reflexive Serif
Transitive Serif
Heavy Slab Serif
Cupped
Sans Serif

GROUP 9
Apex
Vertex
Vortex

GROUP 10
Stress
Axis
Diagonl Stress
Inclined Stress
Vertical Stress
Upright Stress
Point of Maximum Stress
Oblique Shading
Vertical Shading

GROUP 11
Tittle
Dot

Diagram 5. Categorisation of Latin nomenclatures in 11 groups. © *Sahar Khajeh*.

5.4. Analysis of Anatomy of Arabic Letterforms

This study attempts to collect the existing nomenclature of Arabic letterforms to see if the approach can be extended to describe all the letterforms in their four variants[36]. This document compares three different sources[37], which have analysed the anatomy of letterforms of Arabic script in various ways (Figure 66); there is a lack of definition in the terminologies, all three sources including just the terminology and illustration. Also, the interesting point is the multilingualism of these resources since each is present in a different language. It is the writer's responsibility to translate the words into English. The importance of equivalence compared with translation is also considerable for the result. At this point, however, translation is adequate for clarification of the current gap in this field.

The nomenclature for Arabic letterforms is not comprehensive. Each typographer uses his/her strategies and terminologies to work with Arabic script. The typography debates require a system of nomenclature for different parts of the letterforms, to enable designers to point out individual sections of an alphabet. Accordingly, as Haley et al., (2012) has pointed out:

> "most professions develop their terminology to facilitate the communication of thoughts and ideas, and typography is no exception. All design practitioners need to be well versed in the language of typography so they can communicate clearly with one another, especially with others who work with typography or lettering." (p.153)

For example, Fozouni (2014) mentioned the limited availability of descriptive words to define a specific part of a letter in Arabic script. In his interview with a BBC channel, he indicates that there are no appropriate words to describe Persian alphabets. For example, if we want to talk about the top part of the letter ق, we must select some words from our unsuitable informal language to describe the letterform.

Nomenclatures provided by Mesghali (2015:47), deal with eleven different terms to describe all the Arabic letterforms. In this case, each term addresses different strokes in different letterforms. Mesghali's book is the most popular typography book in Iran in the Persian language, although the source excludes an in-depth analysis of Arabic letterforms.

For example, the nature of Arabic script is rhythmic and fluid; therefore, each letterform includes different and opposite strokes, in which each letterform can potentially break down into different parts. For example, in this source only the counter part of the final position of the letterform ‘ع’ has been mentioned. The strokes like a bowl have not been analysed. Like Latin letterforms, each Arabic letterform consists of various components that need to be defined in specific terms. In this case, considering the anatomy of Arabic letterforms, the analysis is not comprehensive and requires extension (Figure 60).

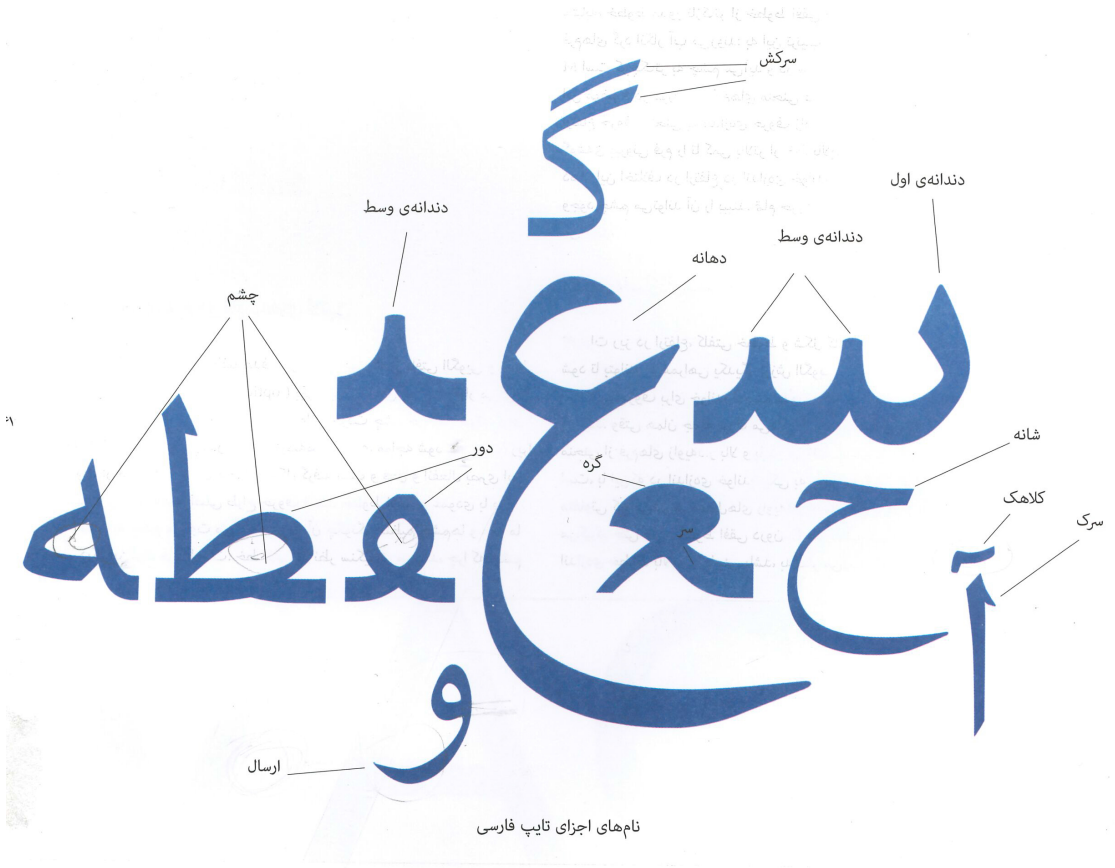

Figure 60. Nomenclature of Arabic letterforms provided by Mesghali (2015).

Furthermore, in the Arabic anatomy of letterforms provided by Mesghali, the same term is used to describe three different anatomies with the same function, but different visuals and characteristics. For example, he uses the term (Eye) ‘چشم’ , for all the negative spaces within a closed stroke in the final position of letterforms ‘ه’, the letterform ‘ط’, and middle position of letterforms ‘ف’, without dots, which is the same as for middle letterform ‘ق’ (Figure 61). Meanwhile the same situation in the anatomy of Latin letterforms is treated

differently. For example, according to Samara (2007:116), the negative space within a closed stroke in the lowercase letterform ‘e’ is called the ‘eye,’ while the same area in the capital letterform ‘R’ is called the ‘counter.’ Also, considering the Latin nomenclatures presented by Blackwell (1992:164), the negative space within a closed stroke in lowercase letterform ‘g’ is called the ‘loop’. In this case, AbiFarés (2001:181), made a smarter decision and used different terms for the same situation. The terms are present only in the English language, which needs development to find equivalents in the Persian or Arabic languages. The list of nomenclatures used by Mesghali includes سرک, شانه, گره, دور, چشم, سرکش, دندانه اول, دندانه وسط, کلاهک, دهانه , and ارسال .

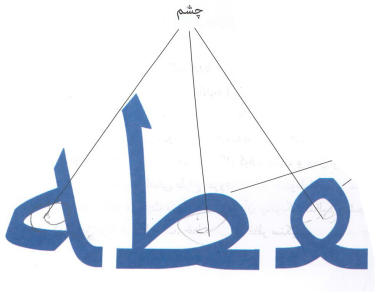

Figure 61. ‘چشم’ , Arabic nomenclature by Mesghali (2015).

In comparison, AbiFarés (2001:181) provides a more successful anatomisation of Arabic letterforms. In some cases, one letterform is divided into more than one stroke. However, still fewer letterforms have been analysed, compared to the whole Arabic alphabet, like ‘ ی ه ک ن ل ف ق ط رس د’. In addition, some letterforms like ‘م’ (mim), have a different form in various positions, which might require deeper analysis. So again, the lack of comprehensive analysis is evident in this research. The same phenomenon can be observed in Mesghali’s Arabic nomenclature. For example, he only deals with the final position of the letterform ‘ـه’ (he-ye do-češm), even though ‘ه’ (he-ye do-češm) on its own could be broken down into its separate parts. This letterform has four differing visual forms for different positions. Each position of this letterform needs deep analysis and appropriate terminology to become definable (Figure 62).

ـم	ـمـ	مـ	م
ـه	ـهـ	هـ	ه

Figure 62. Four variant forms of Arabic letterforms ‘mim’ and ‘Heye-Do-Chashm.’

With respect to the efforts of AbiFarés, it seems that providing a comprehensive system of nomenclature or terminology for Arabic script is not taken seriously. For example, in her book ‘Arabic typography book’, which is a huge exploration of Arabic typography, just one image is allocated to the anatomy of Arabic letterforms. There is no further explanation about the importance of the anatomy of the letters, no definitions are provided for the terminologies and no translation in Arabic terminologies is provided, while the list of terminologies in the English language includes stem, loop, tooth, knot, shoulder, bowl (twice), head, stack tail, needle eye, stiff tail, eye, curled tail, flat tail and diacritic dots (Figure 63) (AbiFarés, 2001).

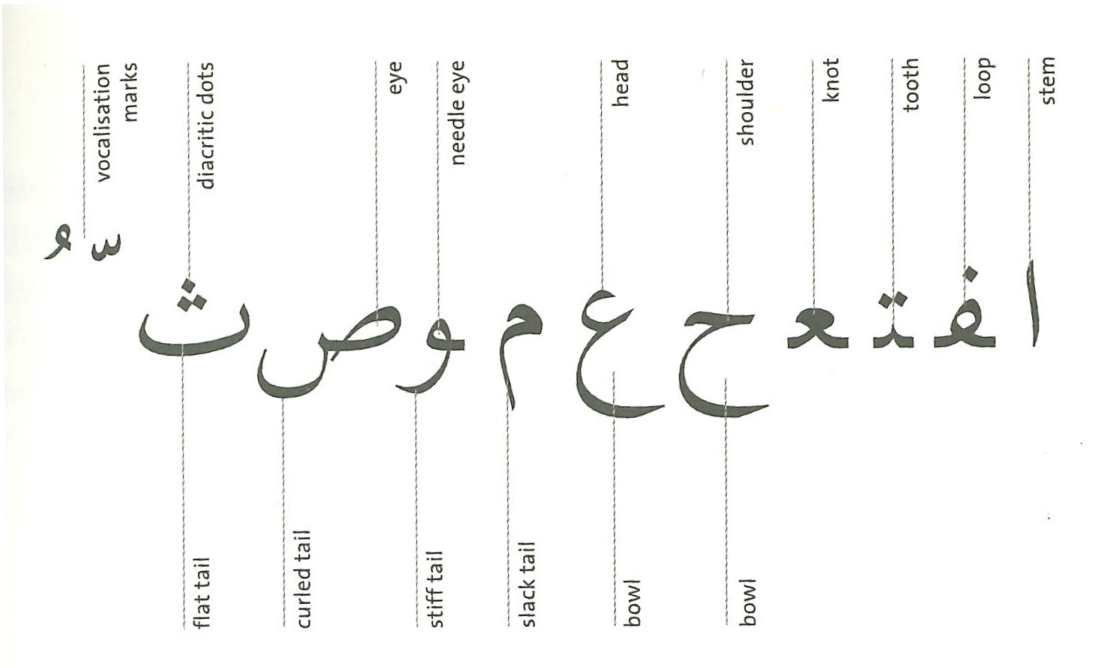

Figure 63. Nomenclature of Arabic letterforms provided by AbiFarés (2001).

Mesghali’s nomenclatures for Arabic letterforms are considered translations of terminologies that AbiFarés used. The translations are not the best and/or are an inappropriate method of creating a terminology, since the principles of each script system must be considered in the nomenclature system of that script. Research suggests that

according to Latin principles, especially the anatomy of Latin letterforms, the strokes resemble the anatomy of the human body (McLean, 1980). However, in Arabic letterforms, due to figurative representation being prohibited; the love and fascination of Arabs for mathematics and geometry; and due to the highly sacred level of divinity; geometric structural principles were applied even to art and type. A circle is a perfect shape for infinity and inter-relationship. Therefore the original principle of the Arabic typeface is governed by three elements of point, line, and circle; however, to serve the principle of harmony and legibility, Arabic type goes beyond mere rules of geometrics (AbiFarés 2001:93). Clearly, applying the same system and terminologies of the Latin nomenclature system to Arabic is not a suitable method. However, the method of presenting a nomenclature system, as discussed in the previous section, is applicable to the nomenclature system of Arabic script. The third source includes the anatomy of the Arabic script provided by Zoghbi, (2015), in which each letterform is broken down into up to four different parts, showing how deeply he analysed each letterform. However, the provided nomenclatures for Arabic letterforms include just seven letterforms, three of them having the same ending. Therefore, the system needs extension. Ultimately this final source presents a more comprehensive analysis of Arabic letterforms. Although the lack of comprehensive observation about all Arabic letterforms is evident, these seven letters are broken down into different parts perfectly. There are more than four terms to describe the different strokes of one letterform. Also included are additional letterforms, including ‘ر, ق, لا’ which were not demonstrated in Mesghali’s and AbiFarés’ resources. However, there are still certain letterforms, including ‘د, ل, ن, ى’ which are not analysed in any sources. Moreover, for some letterforms, only one position has been analysed, while the other three variants include different forms and require more analysis. Fortunately, in this source the terms are present in both Arabic and English languages. They are: didactic dot / نقطه , head / رأس , tooth / سن , neck / عنق . رقبة , whiteness / فضا بياض. , belly / بطن , tail / ذنب , arm / ذراع , tail / ذنب , bowl كاسة , chin / ذقن , basin / حوض , belly / بطن , tail / ذنب , head / brow / حاجب رأس. , eye / diamond / لوزة . عين , and corner / angle / link / زاوية . وصلة (Figure 64).

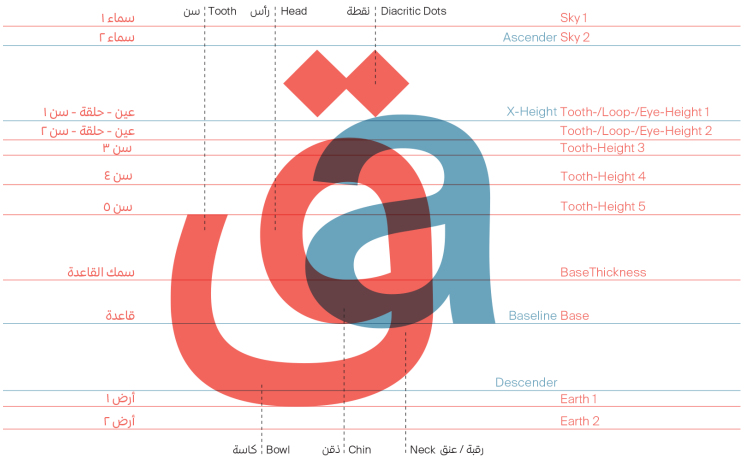

Figure 64. Nomenclature of Arabic letterforms provided by Zoghbi (2015).

Chahine (2012), in her doctorate thesis, provided a guidance on anatomy of Arabic letterforms by grouping the Arabic letterforms that share common strokes. She elaborates on the link between the strokes in each group; however her analysis excludes nomenclatures (Figure 65) . Compared to previous examples, Chahin's analysis sheds light only on the strokes, without considering the negative spaces within the strokes.

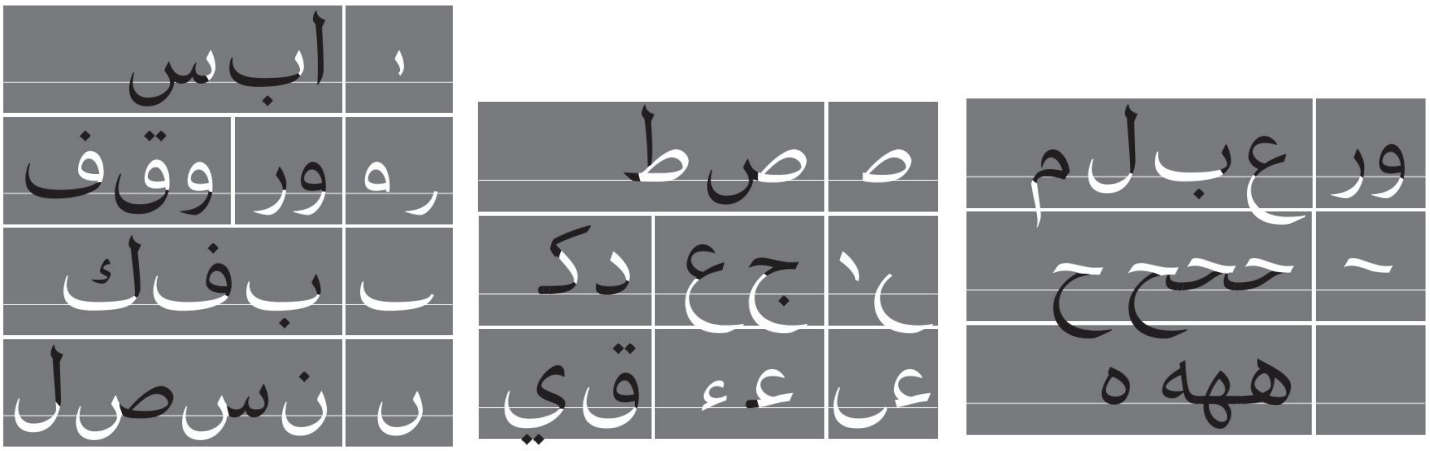

Figure 65. Chahine (2012) Analysis of Arabic Letterforms. In her analysis, letterforms with similar visuals and functions are grouped together; however there is a lack of nomenclatures. The negative spaces in the anatomy remained unconsidered in her analysis.

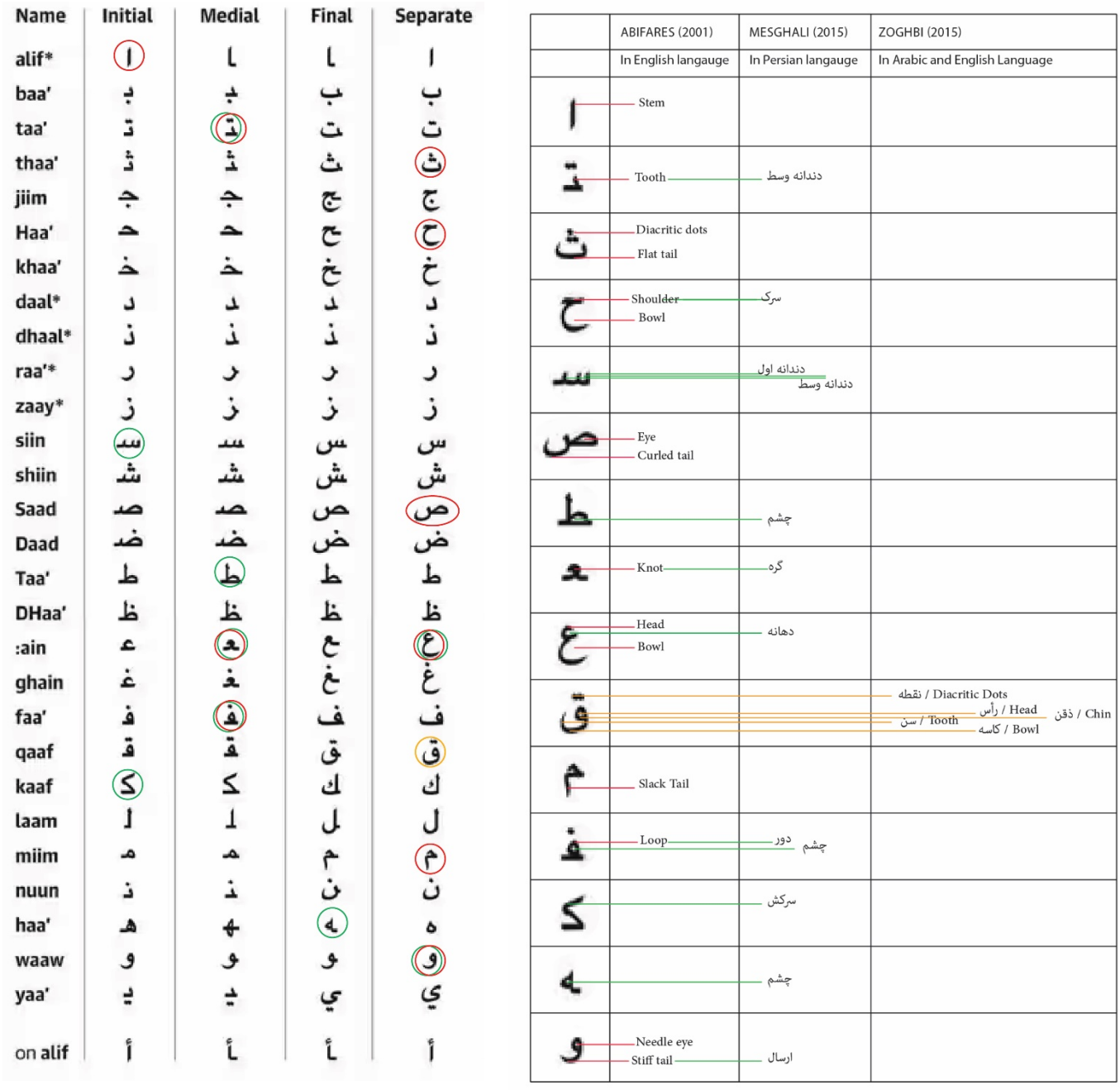

Figure 66: Left: Presents the full sets of Arabic letterforms in four positions. The characters highlighted with a circle are the only letterforms whose anatomy has been analysed through the sources mentioned in this research. The Red circles present the characters that were been analysed by AbiFarès (2001), The Green circles outline those that have been analysed by Mesghali (2015); and the amber circles outline Zoghbi's (2015) analysis. This image shows the lack of analysis of full sets of Arabic anatomies.

Right: Copyright Sahar Khajeh (2023). The table presents the terminologies each of the three sources uses to refer to a specific part. However, each source used different language. More research is needed to define all terminologies in one language. Some terms, such as 'Head', are used by different designers to refer to different anatomies. The table shows Zoghbi's analysis was more successful, since it perfectly analyses one letterform and divides the anatomy into four different strokes. But it is a shame that his analysis shed light on only one letterform.

The lack of a comprehensive anatomy of Arabic letterforms has had a negative influence on Arabic typography, particularly in a temporal environment. The recent observations of Persian Animations present the use of 'fade in' and 'fade out' – a technique used to render a word in a three-dimensional environment – (Pezhmanfard, H. (2012). The same technique has been used on the TV idents (station logos) in Arab channels, with a new technique to present the writing direction of the words (Dreambox, 2012). This means current animated Arabic typographies have made no attempts to break down each letterform into separate parts, which has already been done to a great extent in Latin temporal typography. Therefore, defining the components of Arabic letterforms resulting in a better understanding of Arabic script would assist designers in creating multilingual transactions in a temporal environment.

5.5. Critical analysis

As discussed in the literature review (Chapter 2), Chahine (2012) and AbiFarés (2008) also proposed new anatomies of letterforms for Arabic script for creating harmony typefaces for the practice of bi-scriptual typeface design. Still, neither proposed nomenclature with definitions and each still needs extension to divide Arabic letterforms into smaller strokes. For instance, my analysis (discussed in Chapter 3 and above) shows that choosing a typeface that has higher initial teeth for the letterform 'sin' improves the readability of Arabic script. Alternatively, initial letters with taller or different anatomy would assist with faster word recognition in a sentence. But neither of the Arabic sources that shed light on the anatomy of letterforms discusses the importance of these issues. Saad D. Abulhad (2008:185), provided a guideline on the 'Anatomy of an Arabic type' to clarify the role of Arabic characters in readability and legibility. In his view, "Traditional Arabic appears to conform to six common characteristics: glyph connectivity, multiple shapes per letter, ligatures, variable x-height values, overall horizontality and extensive use of dots." He did not provide a breakdown of the anatomy or nomenclatures. In the end, nomenclatures could be collated from type designers' arguments. For instance, Balius (2013b) in an analysis (p174) of his Arabic typeface design for the letterform [Wāw 'و'] mentioned "because of his small eye and

stiff tail […].” His use of ‘stiff tail’ is unique for the tail of letterform Wāw but there is still a lack of description to identify why the Wāw’s stiff tail may be different from similar strokes of other letterforms. Thorough research is needed to assemble terms and to propose a comprehensive nomenclature for Arabic Letterform.

However, the point is that we do not just need a nomenclature system for Arabic and Latin separately; we also need a new system that analyses the nomenclature of these two systems *together* and proposes a new system for bi-scriptual approaches.

It is beyond the scope of this research to deeply analyse the anatomy of Arabic letterforms. However, without comprehensive analysis of Arabic nomenclature, it is impossible to propose a nomenclature system for the practice of bi-scriptual Latin and Arabic typography. This section has provided the documentation, but developing the nomenclature must remain for further study at the post-doctorate level.

5.6. Conclusion

Firstly, analysis of the anatomy of letterforms in this chapter has helped with terminologies in discussions throughout this research and, most importantly, has improved understanding of the proposed guidance. Secondly, the discussions in this chapter feed recommendations that have been proposed as the outcome of this research as to how designers could identify readability level of a typeface according to its anatomy. This chapter also proposes measures on finding correspondence in Latin and Arabic typefaces by providing a better understanding of similarities and differences between the Latin and Arabic scripts.

Chapter 6: Role of Principles

6.1. Introduction

To decide on the role of principles at play in the practice of Arabic and Latin bi-scriptual typographic layouts, first I collected guidance and principles from the literature review (Section 6.1.1.), and from primary research (Section 6.1.2.) separately. Then I analysed them combined and decided on a new direction. Analysis of the literature shows that a varied guidance was used by designers. That may be the reason for the complexity of learning from present-day sources and the difficulty of extending any of the guidance to another context. Neither literature review nor primary research proposed a complete set, therefore my proposed outcome was collected from the analysis of both literature review and the primary research.

This chapter first demonstrates the guidance identified from the literature review which is a conclusion to Chapter 2. Secondly it demonstrates the guidance identified from primary research, which is the conclusion to Chapter 3, and finally it proposes new guidance that has three sections including the 'Principles', 'Contextual considerations' and 'Typographic recommendations'.

6.1.1. Guidance identified from the literature review (Chapter 2)

Analysis of the literature review shows that the contributing sources are based on exclusive issues that guided sources' bilingual typographic approaches and could be divided into three categories, including sources with focus on the practice of typeface design; those that focus on the practice of arrangement; and those that provided general guidance for practice of bilingual typography, regardless of specific languages or contexts. I extracted the principles and guidance that could feed the arrangement of text for bi-scriptual Latin and Arabic

typographic practice from each category separately, and I demonstrate below the contribution of each category towards my final guidance.

The sources focusing on the practice of typeface design demonstrate the necessity for achieving visual harmony, equality between the apparent sizes and styles of typefaces, contrast and appropriate density, and colour or texture between the two scripts. The role of leading, as an important typographic element, is a significant area for discussion. These sources demonstrate the importance of acknowledging the culture of coexisting scripts, the visual appearance of the letterforms, the scripts' typographic customs and requirements, considering the readers' cultural background and their reading habits. Furthermore, in rare situations, the importance of acknowledging local taste attached to linguistic issues was raised in certain projects. The issue of readability and legibility affected by the technological limitations for particular scripts was the centre of discussion in general. In addition, two typographic approaches were identified within the analysis of these groups of sources: *harmonisation*, i.e. producing visual harmony with respect to the culture of each script; and *matchmaking and Latinisation* of non-Latin script with the aim of achieving totally balanced visual forms. However, despite a number of sources proposing a standardized guidance for achieving harmonisation or matchmaking, there was a contradictory argument that harmonisation depends on context. Finally, the role of designers as decision-makers, and the importance of designers' familiarity with the script and the language(s) were central to the discussions.

The factors and effect of culture of the script and the language were more prominent in discussions about bi-scriptual logo design, either by creating new letters or pairing letters from existing typefaces.

The discussion focusing on the arrangement of text in bilingual layouts evidently evinced principles of parallelism which I put in the same category as equality, balanced treatment, the ethics of inclusivity and the economic relationship of coexistence. More apparent in these discussions was the role of typographic elements, such as the necessity of choosing appropriate styles of typeface for coexisting texts, and the method of arranging bi-scriptual paragraphs according to their reading direction, alignment and materials. Few discussions shed light on considering readers' backgrounds as monolingual or bilingual without detailed

analysis. An exclusive principle identified from this group of sources is the concern about the relationship between the typographic layout and the audiences. The user experience was addressed in the majority of sources with focus on the arrangement of texts, but detailed discussions are more apparent concerning bilingual road signs, and bi-scriptual approaches for websites. The culture of the script was the centre of discussions, but there were fewer details about differences between the two scripts compared with discussions focusing on bilingual typeface designs.

Furthermore, the contrast in the relationship between the texts and the backgrounds was addressed in discussions about road signs. Despite the arguments put forward about typeface design regarding contrast between the visual forms of the two scripts, in discussions on the arrangements of texts, the contrast pinpointed the relationship between the texts and their backgrounds.

Finally, none of the sources that provided general guidance for bilingual typography commented on the principle of inclusivity, user experience and technology either in coexistence of specific languages, or in concerning specific context. More importantly this group of sources commented on the importance of typographic voice and the design composition.

6.1.2. Guidance identified from Primary Research (Chapter 3)

Analysis of recent bi-scriptual Latin and Arabic publications demonstrated the importance of usability concerning the layouts' function and responding to users' needs. The analysis shows the importance of coexisting languages' status, and equal treatment of both languages' written element, due to the influence of design quality on the cultural identity of readers. In addition, the observations show the importance of achieving equality in text translations by avoiding code-mixing in bilingual publications, and respecting readers' backgrounds, whether monolingual or bilingual. Furthermore, the analysis of case studies shows the importance of a script's culture as determining the first point of perception for the script's readers while, in addition, considering readers' culture has an influence on their reading experience. The analysis also shows the importance of achieving the same tone in pairing typefaces, and the role of an appropriate hierarchy of information and alignment in

defining the languages' status.

An analysis of bi-scriptual Latin and Arabic scripts in history threw up the best practices in the co-existence of Latin and Arabic for situations in which the grid is divided into smaller columns. Analysis of these historical sources feeds the last layer of my guidance as identifying the role of typographic elements and alternative options for the coexistence of Latin and Arabic in columns, and exclusively the coexistence of Latin and Arabic numerals and texts for body-text layouts. The analysis of these historical sources identified best practices in achieving appropriate leading, tracking, kerning, categorisation of information with acknowledgement of lack of typographic supports for Arabic and the influence of choice of layout on the languages' status, among other factors.

The analysis of bi-scriptual Latin and Arabic display layouts shows the role of space, the choice of appropriate paired typefaces according to local taste and local readers' visual memory and, controversially, the importance of inclusivity, and the necessity of designers' familiarity with the anatomy of letterforms to avoid the misunderstanding of one script's visual with elements of another script.

Analysis of available bi-scriptual Latin and Arabic scripts in macOS and Windows shows the importance of collecting appropriate bi-scriptual typefaces with full sets of letters and numbers for both Arabic and Latin. More importantly through analysis of the typefaces I could manage to identify some tips for designers on how to decide on appropriate typeface with appropriate readability in Arabic text, such as checking the counters, initial letters with teeth or final positioned letters with reversed bowl. Finally, analysis of two other typefaces, namely Nassim and Emirates. provides insights about typeface styles to make Latin more fluid, rather than Arabic becoming more geometric and feeds the guidance for context of bi-scriptual logo design on how to manipulate existing letterforms to achieve visual harmony.

Analysis of some bi-scriptual Latin and Arabic shows the role of the glyph in achieving equality in the context of display layouts, and the role of linguistics on bi-scriptual approaches.

Visual observations on analysis of bilingual and multilingual layouts in Istanbul and London mostly fed the second layer of my guidance for outlining objectives such as the role of reading time and position of the layout. The observation also supported a different first

point of perception in a vertical, as opposed to horizontal hierarchy; different approaches for vertical presentation of Arabic and Latin; a different approach in presenting names compared with meaningful texts; approaches on code-mixing; and the importance of typographic 'voice'. The outcome of these visual observations – apart from feeding the proposed guidance in chapter 6 – played a big role in the categorisation and analysis of context presented in Chapter 4.

6.2. Synopsis of Outcome / Method

As the result of the analysis explained above, it is clear that the design quality of a bi-scriptual layout must concern three issues, namely: first, the relationship between the visual elements of the two scripts; secondly, consideration of the relationship between the whole texts with their background and the entire composition; and finally, the relationship between the typographic layout and the intended audience. This approach can be thought of as the visual transition in which, as proposed by Cavalier (1988), typography is a bridge between the type and the reader.

Considering Rutley's argument (1972) in defining 'Principles of Design'[185], and Kahn and Lenk's (1998) in defining 'Principles of Typography'[186], the relationship between two elements plays an important role in defining principles: the first element being 'writing elements on the layout' such as text colours and position; with the second element, the 'background or the surface material'. But these definitions didn't take into account the third element, the 'written element of the second language', that is excusive to bilingual layouts. Although this may seem similar to the first element, the literature proves that it should remain distinguishable; therefore, in a bilingual layout, there is an exclusive principle concerning connection of two distinct languages' writing elements with each other, and the

[185] Rutley (1972) researched reducing safety risks to drivers by improving the quality of bilingual road signs, in Welsh and English, by improving the principles of design. He defined these 'principles of design' as 'play with some characteristics such as position of texts on a sign, size and colour'.

[186] Kahn and Lenk's (1998) article highlighted the role and effects of 'typography' in graphical user interfaces (GUI), by developing their 'Typographic Principles'. They defined these 'typographic principles' as considering 'a dynamic system of contrast resulting from the relationship of the type, its colour, form, rhythm and style, to its background.'

connection of both to the background. The 'text' in a bilingual typography layout includes two different languages, which may share two distinct scripts with totally different visual forms of letterforms, such as – as we have seen – the English and Arabic languages. One characteristic of the 'text', the script, and the visual form of the letterforms, which was the same as the 'text' in monolingual typography, is variable in bilingual typography. Thereby, in addition to the text's weight, typeface style, font size and the colour, the mapping between the visual form of two distinct scripts' letterforms assumes an important role.

As a result of my analysis, the proposed guidance in this study includes three layers, including i.e. a list of 'principles', a list of 'contextual considerations' and a list of 'typographic recommendations', which will help to achieve visual excellence in bi-scriptual Latin and Arabic typographic layouts (Diagram 5).

The principles include those factors that are necessary for achieving a harmonised or a high-quality design. But as discussed in chapter 4 and in this section, the requirements for each principle may be different, depending on the context of the layout. Therefore, as part of this guidance, we need a list of contextual considerations unique to the practice of bi-scriptual typography as a set of criteria that help us assess the levels of required harmony for any particular context. Finally, my guidance includes a list of typographic recommendations as a tool that will help designers respond to an objective and achieve the appropriate level of harmony, depending on the context.

Finally, I analyse the two approaches of Harmonisation and Matchmaking and provide clarification on the role of each approach for a bi-scriptual typographic design.

PRINCIPLES		
TAXONOMIES		DEFINITIONS
Hierarchy	Parallelism and equality	Parallelism is a ruling principle that both Latin and Arabic scripts must maintain the same esteem, neither of them should be subservient to the other. The principle of equality addresses the textual content of both languages that must be equivalent.
	Economic Relationship of Coexistence	This principle refers to designers' decision-making about inclusion of necessary data, and in both languages.
	Grey Value, Density	'Grey value' or 'Density' refers to the texture and balance of colour of a layout, including the texture individual scripts create. The overall grey tone between the two scripts should achieve equal weight, colour balance and texture.
	Balance treatment	Balance treatment of the layout of dual texts in a bilingual layout should respect both scripts' cultures, making appropriate decisions about the grids and proportion of texts specifically in the context of 'body-text.'
Contrast between Scripts		Contrast means the differences between the visual form of scripts must be visually distinguishable.
Integrity		The principle of integrity refers to respecting the cultural identity of the scripts and the readers. A bi-script design should establish such cultural identity and the intellectual heritage of the scripts.
Ethics of Inclusivity		This principle refers to the importance concerning readers' background relating to deciding on the typographic elements of a bi-scriptual layout.
Culture of Design		The principles of the culture of design refer to acknowledging government regulations, and updating academic and non-academic trends in the principles of design and technology needs.
Designer as a decision-maker		The principle of designers as decision-makers emphasises the importance of relying on one's innate visual preferences.
CONTEXTUAL CONSIDERATIONS		
Context Function / Usability		
Reading time		
Readability and Legibility		
Localisation or Globalisation		
Layout Distance		
TYPOGRAPHIC RECOMMENDATIONS		
Dual-text layout		
Hierarchy of Information		
Aligned or justified text		
Corresponding typefaces		
Leading, Kerning, Tracking		
Adaptation to technology		

Diagram 6. Copyright: Sahar Khajeh 2023 – Presents the outcome of this research and guidelines for bi-scriptual Latin and Arabic typographic layouts, including the Principles, Contextual Considerations and Typographic recommendations.

6.3. Outcome

6.3.1. Visual Excellence: a method to achieve high-quality design

As discussed in Chapter 4, Context Analysis, and in this chapter, the role of each principle in a context is different, depending on the objectives listed in Section 6.3.2. Therefore, the different approaches of 'Harmonisation' or 'Matchmaking' may need context.
Matchmaking refers to a high level of visual map, to the extent that one script loses its cultural identity in favour of becoming visually as close as possible to its counterpart script. In this regard, the literature review shows, Arabic tends to become closer to Latin, rather than vice versa. This is called Latinisation.
However, as analysis during the course of this research shows, respecting the culture of scripts is a vital issue in the majority of bi-scriptual layouts to serve the needs of readability, respecting the cultural identity of readers and serving usability according to the contexts. In this case, although it is still necessary to make the visual appearance of the two scripts closer, there might be different levels of visual similarity, depending on any requirements imposed by the context. Therefore, despite the matchmaking that we aim for in a visual map, a very high similarity between the visual appearance of the scripts, in Harmonisation, visual similarity and form is not the top priority. However, the form must still serve the context function. Therefore, instead of a visual map, a 'visual compatibility' (Stuttard, 2012)[187] is required.
In Harmonisation, the role of each principle may be different and depends on the objectives of the layout. One principle may play the more dominant role, or may not play a role at all. In this way, the level of a visual map in terms of visual similarity of the scripts may vary in different contexts.

[187] The term Visual Compatibility is borrowed from Stuttard (2012) to explain, 'Not matching. Not matching, but balancing visual compatibility'.

Therefore ‘Harmonisation’ or ‘Matchmaking’ are both different methods of achieving different levels of visual similarity, depending on the context function and user needs.
My proposed method to achieve high quality design in bi-scriptual Latin and Arabic script is to achieve ‘Visual Excellence’.
Visual excellence is a subjective term, defined as a tool for approaching a high-quality design by achieving an appropriate level of Harmonisation or Matchmaking in a bi-scriptual layout. In visual excellence we must consider ten principles: parallelism and equality; contrast; integrity; density and balanced colour; balanced treatment; ethics of inclusivity; inclusivity; economic relationship of coexistence; typographic voice; and culture of script. The level of needs for each principle depends on these six objectives: context function and usability; required reading time; readability and legibility needs; localisation or globalisation; layout distance; and material.
It means in one context the needs for contrast and density may be prominent, therefore less parallelism and equality are required. Thus, in achieving visual excellence, the role of each typographic element may be different. This implies that a high design quality in a context or project may take a different typographic approach compared with another project. There is no generic approach in designing bi-scriptual typefaces, since it depends on the situation and intention of the readers and the layout. As Papazian (2005) pointed out, the relationship between partners is different in each dance. Quality is defined as whether the outcome meets the needs.

6.3.2. Principles

The principles are the way by which designers can achieve visual excellence. They include:

- Hierarchy
    - Parallelism
    - Equality
    - Density or Grey value
    - Balance treatment
- Contrast between scripts
- Integrity
- Ethics of inclusivity
- Culture of design
- Designer as a decision maker

6.3.2.a. Hierarchy

The principle of hierarchy includes the sub-categories of principles of ‘Parallelism’, ‘Equality’, ‘Density or Grey Value’, and ‘Balance Treatment’.

6.3.2.a.i. Parallelism and equality

Parallelism is a ruling principle that both Latin and Arabic scripts must maintain the same esteem; neither of them should be subservient to the other. The principle of equality addresses the textual content of both languages that must be equivalent.

Parallelism is a matter of hierarchy (not prioritising one language or culture), and equality is a matter of the content and whether it is equivalent. Parallelism and equality are used interchangeably in academic discussions, and as recommendations in this section show, common typographic treatment aids in achieving parallelism and equality. Therefore, I put them into one section in this guidance.

Designers and researchers of bi-scriptual layouts, such as the juxtaposition of Latin and Arabic (Maag, 2012; Baki, 2013), Hangul and Roman (Paek, 2014); and solo-scriptual layouts, such as English and Welsh (Coupland, 2010), comment on the importance of ‘equality’ or ‘parallelism’ in bilingual layouts.

According to bilingual Latin and Arabic script researcher Baki (2013:39): “Parallelism, in the context of a globalized Arab world becomes particularly important, as the governing principle should be, that the local language is held in the same esteem as English, not as a subservient second, echoing colonial relationships between the West and the Middle East. ” Researchers of a different bilingual context (Coupland, 2010), investigating the effect of Welsh’s bilingual road signs affecting the safety risk to drivers, in ‘Welsh linguistics,’ addressed ‘parallelism’ as the main principle in bilingual road layouts. Coupland (2010:81) claims “it is possible to format bilingual text, stylistically, following principles of parallelism in several different ways.” Maag’s (2012) and Coupland’s (2010) research defines some typographic values for achieving parallelism in bilingual layouts.

According to Coupland (2010:83): “The main [principle] is equality: Welsh and English must be given equal weighting and prominence, so that the same access is afforded to each language”. Equivalence is interpreted in the specific sense that the textual content of Welsh and English must be identical. Then, once again, there is a choice, in the assumption that bilingual speakers/readers will be able to choose whether to access the content of a text either in Welsh or in English.

Considering Khosla’s (2020) point about the role of bilingualism in India, that it could place all readers on an equal footing, parallelism could bring the same tone and equality in juxtaposed Devanagari and Latin scripts and play a significant role in giving a sense of equality to all India’s Devanagari and English readers.

The analysis of successful approaches in multi-scripting of Hangul and Roman[188] typefaces, conducted by designer and educator, Jung Yeun Paek (2014:18) indicates that, for better communication, one alphabet should not overpower the other; instead, they must be treated equally. Usually, Hangul needs to be manually reduced in size to avoid it overpowering Latin because, due to the geometric appearance of Hangul scripts, it looks bigger and heavier on the page when it sits beside Latin[189] (Paek, 2014). This issue is reversed in the juxtaposition of Arabic and Latin. In evaluating the level of ‘equality in tone’ in juxtaposed Latin and Arabic scripts, Maag (2012), states that the Latin script mostly sets

[188] Paek uses’ Roman’ to address Latin script. In this research, we use ‘Latin’.

[189] Kwon (in Wittner et al., 2020:170) suggests: ‘A general tendency is for a regular Korean font for the body text to be lighter than a common Latin one, otherwise, the Hangul script will appear to protrude from the page.’

the ‘tone’; therefore, the Arabic script takes the secondary role, because the very different ‘body-size’ and ‘visual forms’ of Arabic letterforms compared with Latin make it difficult to give the same tone to both. Observations by Kisman, El Mir and Youssef (2010:146) show ‘the differences in length and shape between the Arabic and Latin scripts make them difficult to synchronize in the written form’.

The point is that the consistency in achieving the same ‘x-height’ and ‘body-size’ in Latin letterforms makes the Latin script more prominent and sets the ‘tone’ in juxtaposition to Arabic letterforms.

Furthermore, in analysing why Latin tends to be dominant over Arabic in a bilingual layout, Baki (2013) refers to the fact that Western influence is manifested in graphic design.

Finally, as Tam (2017), commented, the level of making two scripts visually equivalent depends on the context function.

Achieving Parallelism and Equality, consequently, results in a united typographic voice, which is about every text element in a bi-scriptual layout having to collaborate as part of a whole. Research suggests the whole image of the paragraph is important, rather than individual letter forms (Balius, 2013; Paek, 2014). The typographic layout must deliver unique visual identity and voice in the combination of both scripts’ elements. As Jan Tschichold (2006:12) put it: “Just as every human being is part of a greater whole, and is conscious of his connection with it, so his work should also be an expression of this general feeling of wholeness.”[190] This issue is more prominent in display layouts.

Analysis through the course of this research shows the influence of the factors below on achieving parallelism:

- Use of different form (lettering or typesetting) for juxtaposed scripts, where one language is presented in set type and the other language is handwritten, influences the hierarchy of the script. To achieve parallelism and equality, both need to be in the same form (lettering or typesetting)
- Different apparent sizes, leading and kerning between the two scripts result in the superiority of one script.

[190] As Jan Tschichold (2006:13) affirmed, ‘the arbitrary isolation of a part is no longer possible for us - every part belongs to and harmonises with the whole.’

We must consider that readers of a bi-scriptual Latin and Arabic layout that use the English and Arabic languages may be readers only of either English or Arabic, or they may be capable of reading and understanding both. In the former scenario, for instance, if in an Arabic article, a considerable amount of information is written in Latin script without providing translation into Arabic, the reader cannot understand the concept and may miss some important information. Depending on the necessity and value of the message for readers, and on their situation, this approach may have negative or risky consequences.
The latter scenario – where the reader is capable of reading and understanding both languages – may seem non-problematic, since the reader can read and understand the full content. However, it is more complex than it appears. The research in linguistics and sociolinguistics by Whitney (1881) and Cattell (1887) – cited in Li and Moyer (2008) – shows the interaction between elements of two or more languages in the person's mind is a main factor in the phenomenon of bilingualism. This influences an individual's ability to switch or move between two different languages. Linguistics research sheds light on the fact that the switch between languages happens differently in different bilingual people, influencing the level of an individual's understanding of bilingual communication (Li and Moyer, 2008). It is beyond the scope of this research to investigate the influence of this factor in more detail, but the important point to consider for creating bi-scriptual typographic layouts as per the discussions in linguistic research is that a mix of scripts on a layout, even targeting bilingual audiences, cannot guarantee comprehensive audience understanding of the content[191].
Similarly, Baki (2013) commented on the inappropriateness of bi-scriptual Latin and Arabic posters in Lebanon. A majority of Lebanese are capable of reading and understanding both Latin and Arabic, but layouts of texts do not consider bilingual readers.
The head of the Department of Typography and Graphic Communication at the University of Reading, Sue Walker (2001), who publishes widely about 'typography', claimed that the influence of non-expert typographers on shaping current graphic language and typography

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A: As the literature review in Chapter 2 shows, the effect of this issue is more evident in situations where there is a time limit for reading the data, such as bilingual road signs. Research (Routley, 1973; Kinnear et, al., 2012) shows the inappropriate design quality of bilingual English and Welsh road signs improves the accident rate, and as a solution, Routley proposes that the typographic designs must change.
B: This concern is more significant in contexts where typography becomes a bridge between the written element and the meaning behind the context.

is linking ‘Typography’ to ‘Linguistics’ more than ever.

Typographers should consider readers’ capabilities and needs in typography approaches, as follows:

- The use of an appropriate typeface that presents equal style, tone and size.
- The alignment of paragraphs must respond to the reading direction of the script. Alignment for parallel layouts that is appropriate for Latin reading direction, but inappropriate for Arabic, puts Arabic in a secondary position.
- Equal translation for the texts on the layout as grouped information in airport signs must receive equality when we take into account the hierarchy and pairing of typefaces.
- Presenting text vertically, based on a vertical baseline, needs a different approach for Latin compared with Arabic. The different reading direction and different ways letters may sit individually on top of each other, rather than side by side, must be considered in accordance with each script’s needs.
- To achieve equality, the same layout and text arrangement must apply to both scripts. Different arrangements of Latin and Arabic on a layout for similar groups of texts will influence the equality of the text. For instance, in a title layout, presenting one script centred, but applying left alignment for the other script: or, in vertical alignment, unequal space for top and bottom of the page affects the perception of a language.
- Large differences in the length of texts in a paragraph between the two scripts must be avoided, since different length of scripts in a paragraph, particularly in short ones, may suggest a different status of the languages.
- Equal hierarchy, weighting and grouping of information must apply to juxtaposed scripts. For instance, the use of different weight and style for titles and headings in Latin compared with Arabic may give Latin a primary status.

6.3.2.a.ii Economic Relationship of Coexistence

This principle refers to designers' decision-making about inclusion of necessary data, and in both languages.

Baur et al. (2020:29) has written of 'the economic relationship of coexistence'. He describes 'economic' in this context as what is considered necessary is presented in both languages. The literature review shows that a greater amount of text on a bilingual layout increases mental demand and influences the readers' performance, and that a lack of adequate space on road signs results in a lack of contrast between the juxtaposed languages. In addition, analysis of the primary research shows a lack of adequate space on some display layouts results in code-mixing, squeezing the texts and inconsistency in the size of grouped texts. Considering the discussions about parallelism and equality, respecting the principles of 'the economic relationship of coexistence' contributes to achieving parallelism and equality. Routley (1972) observed that a greater number of words on a bilingual sign than on a monolingual sign automatically affects the bilingual layout's reading time. He suggests keeping the number of words in a bilingual sign to a minimum.

6.3.2.a.iii. Grey Value, Density

'Grey value' or 'Density' refers to the texture and balance of colour of a layout, including the texture individual scripts create. The overall grey tone between the two scripts should achieve equal weight, colour balance and texture.

The colour in this context does not refer to 'hue'. It refers to the overall grey tone of the layout that is created, according to the contrast between the texture of the texts and the background, and according to the spaces caused by leading, kerning and different alignments.

Nemeth (2006), as part of the principles he proposed for designing a harmonious Latin and Arabic type family, proposed 'colour/weight'. Nemeth's 'colour' principle refers to achieving balanced weight in Latin and Arabic scripts' juxtaposition. In typography, the term 'weight' usually refers to the available range of heaviness of a typeface, including 'regular,' 'bold,' or italic,' for example (Samara, 2014). However, Nemeth (2006), states that density or weight refers to the level of text's density. influenced by the scripts' structure and the visual form

of the letterforms. Similarly, Wittner et al. (2020:16) comments on the importance of achieving 'colour balance' in bilingual layouts and referring to this issue as achieving an 'overall grey tone' or balanced texture. According to Baki (2013:39): "texture of the script refers to the type created by the strokes as well as the curvature of the script."

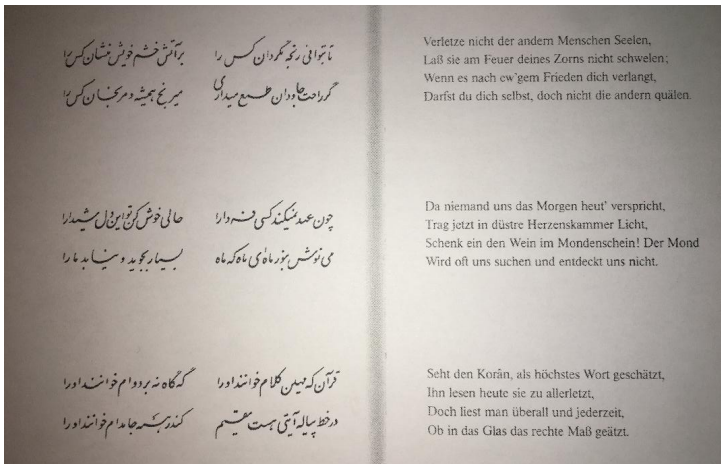

Figure 67. Different texture, grey value or density in an Arabic block of text compared with the juxtaposed Latin block of text. The Latin text is the translation of the juxtaposed Arabic poem. Copyright © *Nemeth (2006:27)*.

Analysis through the course of this research shows the influence of the factors below on achieving density and balanced colour:

- The different anatomy of Arabic letterforms compared with Latin results in unequal density between Latin texts compared with the juxtaposed Arabic texts. Apart from different shapes of strokes in the Arabic, the two scripts share different numbers of strokes within an individual letterform. Finally, the anatomy of Latin letterforms consists more of vertical strokes, while Arabic consists of more horizontal strokes. As Nemeth (2006) points out, the information written in Latin script features between the baseline and x-heights, which creates a more robust line structure compared with Arabic script.[192]

  To achieve a balanced density between Latin and a juxtaposed script, researchers of bilingual layouts propose using a defined and standard mathematical proportional

[192] The anatomy of Latin script includes a defined system of linear strokes. In contrast, the Arabic shape of strokes is not systematic (Nemeth, 2006).
Also, Nemeth's claim that the x-height applies to Latin letterform anatomy is valid for lowercase. However, the Latin script's linear structure is stronger in uppercase, since all the letters achieve equal body-size.

ratio for designing the script's letterforms in the typeface design (Paek, 2014; Wittner et al., 2020)[193]. This means, designers must be cautious in deciding on typefaces for a bi-scriptual layout. To achieve an appropriate level of density, the paired typefaces should become close in the proportion of letterforms and letter or word spacings. Latin typefaces with old-style proportions with small x-heights and long ascenders and descenders may be a better match with Arabic typefaces.

- Arabic script does not follow the consistent letter spacing system that applies with Latin script. The visual shape of an Arabic letterform when it sits beside other letters to create a word may change according to its position in a word.

Multiple Arabic letterforms may sit side-by-side without any disconnection or space between the letterforms. Thereby, an Arabic line has more density compared with a Latin line; and the longer an Arabic word is, the higher the level of density. Due to this difference, AbiFarés (2001:95) states: "the most [basic] unit of the written text in Latin script is the letter, whereas in Arabic, the basic unit is the word." For deciding about the density of text in Latin script, AbiFarés' argument suggests the individual letterforms are considered as a unit, and it is the anatomy of letterforms that could affect the overall typography colour. But in Arabic script typography, a word is considered a measurable unit, because it is the overall shape of the word as a system of linked letterforms that affects the density of the text. AbiFarés' argument raises a valid point because, in Arabic type, the characteristics of individual letterforms change in favour of the overall shape of a word, which strongly depends on the juxtaposed connected letters. However, this phenomenon is also true in Latin type because, due to the shape of juxtaposed letterforms, a larger counter may be

[193] For example, Yeun Paek, in his research about the juxtaposition of Hangul and Latin, observed that capital Latin letterforms, C, D, G, O and Q fit in a square, while A, H, K, N, T, U, V, X, Y and Z are ¾ of a square and B, E, F, L, R, P and S are ½ of square. Therefore, in designing the Hangul letterforms for Nanum Gothic's Roman typeface, the same proportion was applied and acclaimed as one of the best available Hangul typefaces for juxtaposition with Latin script in bilingual layouts for body-text (Paek, 2014). However, not all scripts follow a consistent proportional system: while Chinese characters all follow the same width and height, Arabic letterforms have variant widths and proportions. Both Latin and Hangul characters could fit in square or rectangular forms. Since the letterforms within both scripts are disconnected, it is possible to calculate the proportion of Latin letterforms and establish the same proportion for designing the Hangul letterforms, which improves the density of the juxtaposed scripts.
Despite the suggestion by the contemporary researcher Sahar Afshar at a typographic talk in ATypI 2017, about the Ibn-Mugla proportion system's usability for designing Arabic typefaces, AbiFarès (2001) argues that Ibn-Mugla's proportional approach is not appropriate for Arabic typeface design and bilingual layouts. My observation shows the usefulness of Ibn-Mugla's approach for bilingual Latin and Arabic scripts. First, Arabic letterforms have more variety in width than Latin letterforms which follow a standard system of 'M' size.

created. For example, juxtaposition of capital 'L' with a lowercase letterform creates a much greater counter. However, this effect is more prominent in Arabic script, because in Arabic type the shape of a letterform totally changes depending on its position and the juxtaposed letterform, whereas in Latin type the visual shape of a letterform remains the same, no matter what the letterform's position or the juxtaposed letterform is. However, there is an objection to AbiFarés' claim. Although the density of an Arabic text has an effect dependent on the overall shape of words rather than letterforms, the shape is still variable, due to the visual shape of individual letterforms that sit together. Therefore, instead of claiming to consider words as a unit, we could conclude that, in Arabic type, determining a text's density of colour, as long as the shape of individual letterforms for different positions play important roles, forms the overall shape of words. Therefore, the measurable unit in Latin type is letterforms but in Arabic type it is letterforms and words.

- Variety and multiplicity of counters in the anatomy of letterforms provide challenges in achieving consistent density between the juxtaposed scripts in a bilingual layout.

As Wittner et al. (2020) research, shows, the counters' specific characteristics and the relationship between the counters of two juxtaposed scripts could help designers of bilingual graphic design materials achieve a common texture between the two juxtaposed scripts. The anatomy of Arabic script consists of large numbers of open and closed counters and rounded strokes, each in variable shapes. For display layouts, therefore, one solution is to assess the characteristics of counters in the anatomy of Arabic letterforms[194].

[194] Researchers of bilingual layouts (Paek, 2014; Wittner et al., 2020) suggest that to achieve balanced density, a designer has to identify first the strokes and counters in the anatomy of letterforms that affect the text density in the bilingual layout; secondly, recognise the strokes that have common features with Latin counterparts. For example, to fix the problem of Hangul's irregular density and darker text in juxtaposition to Latin script, Jung Yeun Paek (2014) observes that applying a wider counter to Hangul's characters makes the script lighter in a smaller size. This means applying wider counters to the anatomy of Hangul letterforms helps to reduce the darkness and density of Hangul text in juxtaposing it with a Latin text in a smaller size. It also results in a balanced colour in a bilingual layout. However, as Paek (2014) observed, the issue of colour is only solved in a smaller size because wider counters affect the readability of text. Furthermore, a wide counter within the Hangul script requires manual or optical kerning rather than mathematical calculation. (Paek, 2014).
Leonidas (in Wittner et al., 2020) similarly focused on the method of analysing the anatomy of Greek letterforms to achieve harmony in the juxtaposition of Greek and Latin scripts. According to his observations, achieving a 'good texture' in a Greek paragraph is challenging, due to the abundance of counters and a variety of curved shapes. Besides, the visual shape of the Greek counters is a barrier towards achieving proportional texture. According to Leonidas (2020:134): "The dominant presence of counters in the Greek script means that as the weight increases, so must the contrast, regardless of the text variants". As a solution, he investigates two traps: "spacing the round letters too tightly (which increases inconsistency along each line) and designing letterforms without the 'instrokes' and 'outstrokes' that originate in the written forms of the script (these in- and outstrokes help space the letters and give a better rhythm to the paragraph)." He proposed started spacing in a hierarchy beginning with round shapes, followed by moves to diagonal letters and finally spacing the letters with vertical strokes. Yet, he suggests making the shape of counters narrower to allow for a clearly defined right stroke,

- The needs for different line spacing or leading in Latin script compared with Arabic affect the weight or the colour balance in a juxtaposed Latin and Arabic script.

As Nemeth (2006:7) mentioned: "assigning the same leading to both scripts of the same point size results in a very generous leading on the Latin side, whereas the Arabic shows a conventional interlinear." Although achieving equal body size between Arabic and Latin scripts could solve the line-spacing problem, analysis of the Latinisation method shows that equal body size reduces the readability of the Arabic. Instead, Wittner et al. (2020) as a solution for the needs of different leading in different scripts, suggests identifying the similar details of the juxtaposed scripts in designing letterforms. For example, he suggests comparing the anatomies of both scripts' letterforms to identify effective stroke constructions, counter proportions, stroke thicknesses and the letterform characteristics as fluid or geometric.

The need for more generous line spacing is the same in Devanagari or Hangul juxtaposition with Latin script. As Devanagari needs more generous leading in comparison with Latin, due to the vowels written above or below the base characters (Singh, 2020:108), Hangul needs more line spacing to serve the readability and legibility

which will balance the form and give some space to the letter's right side. He suggested that: "if the alpha is too wide (for example, if it is modelled on the Latin 'O'), then the texture would be too inconsistent and light". compared with matching the width of 'omicron' accordingly. He continued with identifying the letterforms with shapes and affirmed that anatomy causes visual disparities in a paragraph. For example, he argued: "the outstroke of the iota is essential to help space the typeface and control the overall darkness of the paragraph. The epsilon works better if it is wide enough to allow generous counters between its strokes".

Leonidas' approach to solving the problem of density and colour in bilingual Latin and Greek typographic layout is to play with the spaces around texts affected by the anatomy of rounded strokes and closed counters. The anatomy of Arabic letterforms consists of multiple and variable open rounded strokes and closed counters that cause inconsistent space between the final position letterforms juxtaposed with isolated letterforms. For example, in the word 'قوار' the space between the 'و' and 'ا' needs manual adjustment to reduce the wide space between the two letterforms. The inconsistent space between Arabic letterforms causes inconsistency in density and grey tone in the Arabic text. As a result, it affects the density and colour of the bilingual layout. To solve the issue, Leonidas' solution of recognising and reshaping the rounded strokes that cause inconsistent space may be what is required to achieve balanced colour in a bilingual Latin and Arabic layout.

Researchers of bilingual Hebrew and Latin layouts (Lavi-Turkenich and Stern, 2020) observed that Hebrew, similar to the Arabic script, has several left-side-open characters – open counters – and has a 'looser texture' in juxtaposition with a Latin script. In Israel, there are several situations, such as trilingual road signs, official road signs, and urban signage, in which Arabic appears alongside Hebrew and Latin script. The independent designer and researcher Liron Lavi Turkenich and graphic and type designer Prof. Adi Stern (2020) observed a considerable number of open counters in Hebrew negatively affecting achievement of 'similar-looking spacing' for juxtaposed Hebrew and Latin scripts. As a solution, they state that: "Open characters combined with the taller x-height make Hebrew seem lighter than Latin when the strokes are mathematically equal. Therefore, it is recommended to treat this optically, and design the Hebrew strokes to be slightly heavier" (p247).

of the scripts (Paek 2014). However, Singh and Paek's research did not cover a solution to fix the inconsistent density this more generous leading causes.

- The style of 'alignment of text' effect on the level of density. Notably in justified texts, the unbalanced level of rivers results in unequal texture and density.
- The frequency of letterforms in a word determines the text-colour balance. This is more prominent in mono-scriptual layouts that share the same script. For some specific occasions, when designers have to make decisions regarding a brand name or written elements on a bi-scriptual layout, it might be important to consider the frequency of some letterforms, which may cause wider counters or kerning.

6.3.2.a.iv. Balance treatment

Balance treatment of the layout of dual texts in a bilingual layout should respect both scripts' cultures, making appropriate decisions about the grids and proportion of texts, specifically in the context of 'body-text'.

To improve readability and give readers the choice of reading both scripts, Baki (2013) discussed the need for achieving 'balanced treatment' or 'well-balanced layout' in bilingual Latin and Arabic scripts. She presents typographic grids and an order of information which links to our innate visual preferences to consider a bilingual body-text layout as well-balanced. Baki's typographic elements have been influenced by the research of Paul Cleveland, professor at Griffith University (2008:37), to include the ratio of overall paragraph and order.

Analysis through the course of this research shows alignment and typographic grids play important roles in achieving balanced treatment. For more guidance on the best practice and influencing issues, please refer to Section 6.3.2 Alignment, and Section 6.3.3 Typographic grids.

6.3.2.b. Contrast between Scripts

Contrast means the differences between the visual form of scripts must be visually distinguishable.

The principle of contrast is more applicable for mono-scriptual typographic layouts, since both juxtaposed languages share the same script, so readers find it difficult to visually identify the relevant language. Wittner et al., (2020) also comment that, especially in bilingual layouts that share the same script, 'contrast' between the two languages has to differentiate the languages and visually help readers to identify and read their relevant texts. However, difference can lead to a lack of harmony, so there is a balance to be sought. Contrast is also a design principle in the field of graphic design, which refers to the relationship between the texts and the background, but this is different to the contrast introduced in this section, since it refers to the relationship between the visual elements of the two scripts, regardless of the whole text related to its background.

In a bi-scriptual layout, the different visual shape of Latin letterforms compared with Arabic automatically serves the principle of contrast. However, analysis of the literature review and the primary research shows, in the Latinisation approach specifically for display layouts in urban environments or logo designs, using the anatomy and metrics of Latin letterforms to create Arabic counterparts makes the two scripts visually very close, to the extent that it diminishes the identity of the Arabic letterform and visually makes it a gestalt, as it could be read as an Arabic letterform and as a Latin one. This phenomenon is observed more in bi-scriptual logo designs or urban projects in which Arabic letterforms are presented separately, and legibility of disconnected letterforms becomes important.

In addition, as discussed previously, similar anatomies of numbers and letterforms between Arabic and Latin may cause misunderstanding. It is important to be aware of each script's culture and its anatomy of letterforms, and to be cautious about situations in which the similar written elements of the two scripts are juxtaposed.

In bilingual road signs and historical publications, different hues are used to serve the principle of contrast but, in this research, I focus merely on typographic aspects, since use of colour hues changes the status of the script and needs its own research to identify its role in each of the principles proposed in this study.

Analysis through the course of this research shows the influence of the factors below on achieving contrast:

- Designers should avoid a Latinisation approach, since it provides similarity instead of difference. (For full analysis of Latinisation, please refer to section 6.5.1.)
- Designers should be aware of all Arabic and Latin letters and numerals that are similar in shape, and which might therefore be associated incorrectly with the wrong script.

The visual shape of number 'seven' in Arabic and the shape of letterform 'v' in Latin are similar. Therefore, 'V' or Seven in Arabic in an individual logo may be misinterpreted. Similarly, as Figure 18 shows, juxtaposition of inappropriate versions of number 'five' in Arabic to 'zero' in Latin may cause misunderstanding. Use of an appropriate typeface style that presents each element distinctively is important to present the correct identity of each letterform. Designers must be aware of the visual experience of each script's readers, including the differing anatomy of letterforms, numbers and punctuation marks between the two scripts.

- Designers should acknowledge the background of readers.

Those capable of reading both juxtaposed languages, depending on the reading time available, may require more contrast between the languages. For instance, for display layouts that are aimed at readers who may be in motion, more contrast between the scripts is needed. The texts may not be fully read by the audience, since the reader may only read the text in its recognisable form or preferred language. Therefore, there should be adequate contrast between the written elements of each language, to make sure the audience can recognise and read the language relevant to them. Specifically, if the audience or the typographic layout is in motion, the contrast should help the audience to identify the relevant text according to the available time. For example, Coupland (2010) observed that bilingual road-sign layouts in Welsh and English must present the English and Welsh's text elements "as fully-formed and separate from each other" (p4) to reduce the required reading time for drivers.

- Grouping information of one language and presenting it with considerable space far from the counterpart script helps the contrast. Therefore, parallel layout has more integrity than code-mixing or code-switching.
- The use of different font size, weight, typeface style and layout could create contrast, but we must be mindful of the required level of equality and parallelism.

6.3.2.c. Integrity

The principle of integrity implies that a bi-script design should establish cultural identity and the intellectual heritage of the script.

Research by Coupland (2010) and Tam (2017) refers to the issue of 'integrity' supporting contrast between the visual elements of juxtaposed languages, so that each script should be distinguishable visually. However, integrity is not just about visual differences; it is also about respecting the culture of each script[195] and the readers' cultural background[196] in emphasising the contrast. To sum up, the principle of integrity respects different cultural attachments to the script.

Studies by Singh (2020) and Takagi (2020) of foreign bilingual layouts (in the juxtaposition of Devanagari with Latin and Japanese with Latin respectively) suggest that bilingual layout designers must find solutions that work best for each script independently, rather than forcing a common solution upon both juxtaposed scripts. As Singh (2020:121) states: "in multiscript it is important that each script complements another script, or has the same voice, while following their own traditions and not necessarily aping one another." The same conclusion was expressed by designers in the analysis of bilingual Latin and Arabic scripts (Noordzij, 2000; Nemeth, 2006). Research by the author, type designer and calligrapher Noordzij (2000) suggest designers should familiarise themselves with features common to both Latin and Arabic, not forcing each script's features on the

[195] For details on issues that can be considered as culture of a script, please refer to section 2.2.5.a.

[196] For details on issues that can be considered as reader's cultural background, please refer to section 2.2.5.b.

counterpart script. Also, Nemeth (2006) claims there is no need to find common ground for the Latin serifs in Arabic type designs, since each script follows different 'rules'.[197]
Analysis through the course of this research shows the influence of the factors below on integrity:

- Gain detailed awareness of the functional and visual differences between the scripts, including the anatomy of letterforms, punctuation marks and numerals. Primary research shows Arabic texts arranged and created by designers of Arabic mother tongue, fluent in Arabic script reading and familiar with the Arabic script culture, result in more eye-catching and eye-pleasing design, especially with fluidity in the connection points of letterforms. Also, it increases readability of the Arabic script.
- Following traditional calligraphic approaches for Arabic is not necessary. Modern approaches with respect to the cultural identity of the script lead to creativity for achieving parallelism and adapting Arabic to technology.
- Sensitivity in considering each script's typographic habits, such as its reading and writing direction.
- User experience is different for readers of different scripts. The reading direction of a script determines the first point of perception.
- Awareness of visual elements in the appearance of letterforms that influence readability or legibility of the script; therefore those typefaces that take these issues into account should be chosen.
  My analysis clearly demonstrated that, for Arabic, the teeth of letterform 'س' or the height of initial teeth for initial letterforms is a good guideline. Awareness of the different ascender approach for bowls and dots. Typefaces with a consistent descender line for all Arabic letters have lower readability.
  In addition, typefaces with wider counters for such letterforms as 'ص' and 'ط' have lower readability. Finally, check the typeface in smaller sizes, to ensure the dots and strokes do not overlap.

[197] Singh (2020:108), in his analysis of the bilingual approach in the coexistence of Devanagari and Latin, observed that: "high-contrast and modulated Devanagari typefaces are a pair match with Latin serif typefaces (for long reading texts); and low-contrast to match sans serif typefaces (for small and display typefaces)."

- Consider the role of linguistic and cultural factors in creating dual visual identities. For instance, below in a phonetic presentation the pronunciation may imply a meaning in the other language (be aware of that). As the discussion in examples of bilingual layouts in Turkey shows, lack of proper pronunciation cannot provide a good experience of communication.
- Be aware of local taste in the script in deciding on typefaces. Chahine (2012:27) discusses that 'people read best what they read most.' It implies people get more engaged with the style of writing that they see the most.
- Be aware of cultural bias in typefaces. Certain styles might have positive or negative connotations in different locations or societies.
-

6.3.2.d. Ethics of Inclusivity

This principle refers to the importance of considering readers' background when deciding on the typographic elements of a bi-scriptual layout.

The principles of Integrity and Ethics of inclusivity have overlapping typographic concerns which are apparent in the recommendations. However, these two principles are distinct. Although the principle of 'integrity' concerns a script's readers' cultural background, the concern about the relationship between the script and the readers refers to the readers' behaviour that is shaped according to reader's visual experience and heritage of the script. In contrast, the ethics of inclusivity sheds light on user experience and how readers' backgrounds influence their reading behaviour.

As Simmonds and Reynolds (1989) argued: "When you are designing information you design not for yourself but for your audience".

Research (Jamson et al., 2005; Kinnear et al., 2012) highlights the change in user performance according to the environment workload and higher mental demand associated with reading a dual text, due to the greater amount of text compared with a monolingual layout. As Noble and Bestley (2005) discussed in the field of graphic design, user engagement improves memorability.

Communication theory is concerned with how a reader engages with a body of text and to what extent readers' backgrounds affect the experience of engaging with a typographic layout.

Noble and Bestley also pointed out that: "'communication theory is the body of work that relates to the study of communication and how meaning is transferred between individuals and groups through language or media".

Analysis through the course of this research shows the influence of the factors below on the Ethics of inclusivity:

- The effect of design elements on user experience according to their different backgrounds is more prominent in display layouts where the audience is in motion at the moment of reading the text.
- The locality of the design, as readers' familiarity with the context and environment aid them in managing their performance to appropriately engage with the context.
- Readers' gaze fixation time is less on layouts that observe the principles of Contrast and Integrity well.
- The cultural diversity of readers' influences user perception in dual texts according to their migration status, and according to their ethnicity and marginal issues such as age and disability.
- Use of an appropriate typeface that intensifies the participant's mood.
- Consideration of audience reading capabilities as being bilingual or monolingual. Multilingual people's brain reactions are different from bilingual or monolingual people.
- The readers' experience with the use of typefaces will define their connection with the text and what associations they make from reading a specific typeface. Therefore, the level of correlation between the typeface and the reader could affect the level of readability. As a result, a typeface in a specific script is not always applicable for users of different languages that use the same script. Each society, based on its national cultural background, welcomes different typefaces. For example, as in the discussion by AbiFarés (2001), both Catholics and Protestants invested considerable time and funds in the production of Arabic books, because

they quickly discovered that their books failed to generate any interest in the East, where they were considered aesthetically inferior to the manuscripts produced by the numerous skilled Arabic and Turkish calligraphers.

6.3.2.e. Culture of Design

The principles of the culture of design refer to acknowledging government regulations, and updating according to academic and non-academic trends in the principles of design and requirements occasioned by new technology.

Primary research shows that designs created by vernacular or non-professional designers exemplify lower quality in bi-scriptual approaches. In addition, the design of display layouts in London was more professional compared with that in Turkey or Lebanon.[198]

Analysis through the course of this research shows the influence of the factors below on the culture of design:

- In London, the culture of design is more professional. Local and regional design regulations are acknowledged. Check government websites and check manual guidelines for competitors.
- Caution in the use of design templates that were created based on the culture of Latin script is advised, since they may disregard the first point of perception: the reading direction for the Arabic language.

6.3.2.f. Designer as a decision-maker

The principle of designers as decision-makers emphasises the importance of relying on one's innate visual preferences.

In situations where you are not familiar with the script or language used, arrange a consultation with an expert familiar with the script(s).

[198] For more information on reasons for this difference, please refer to Chapter 3.

6.3.3. Contextual Considerations

This section aids designers to assess the required level of harmony. These contextual considerations listed below as bullet points determine the level of needs for each principle.

- Context function/Usability
- Reading time
- Readability and legibility
- Localisation or Globalisation
- Layout distance

6.3.3.a. Context Function/Usability

Designers should not rate form above function (Baki:2013). A clear understanding about the function of the layout and the context is needed.

6.3.3.b. Reading time

It is necessary to identify the required reading time within each context. A lack of reading time, especially for display layouts where users are in motion and have a higher fixation gaze, may increase the safety risk to readers (Rutley, 1976). In addition, a lack of appropriate reading time may not allow readers to identify relevant language and information, which may have different consequences in different situations.
The context and higher levels of contrast, integrity and the appropriate economic relationship of coexistence could help readers to manage their performance in reading relevant information. However, the ethics of inclusivity relating to the different backgrounds of readers plays a key role in deciding typographic elements.

6.3.3.c. Readability and Legibility

It is necessary to identify the required level of readability and legibility within each context, since it could determine the method of typographic approach, such as ‘Harmonisation’ or ‘Matchmaking’.

The required level of readability also determines the level of parallelism and equality, contrast, integrity and balanced treatment. Ultimately, it is a key objective for deciding on typeface style, font sizes, hierarchy, alignments and typographic grids.

6.3.3.d. Localisation or Globalisation

It is necessary to identify the role of local taste according to the context function. Localisation allows more customised decisions and relies more on designers' decisions rather than standardising, for example, readers' habits influenced by traditions or conventions influence their reading experience and engagement with a typographic layout. Globalisation may be more applicable for multicultural contexts that have a defined guidance.

6.3.3.e. Layout Distance

As the literature review shows (Rutley, 1976; Tshichold, 2006), different typographic solutions are required according to the different distances between the audience and the typographic layout.

6.3.4. Typographic Recommendations

Typographic recommendations are listed below as bullet points and include a list of typographic treatments that help to achieve the required effect of principles according to the contextual considerations.

- Recommendations for Dual-text layout
- Recommendations for Hierarchy of Information
- Recommendations for Aligned or Justified text
- Recommendations for corresponding typefaces
- Recommendations for Leading, Kerning and Tracking
- Recommendations for Adaptation to Technology

6.3.4.a. Dual-text layout

Analysis through the course of this research shows the influence of the factors below in the arrangement of dual texts:

- A narrower column width for Arabic compared with Latin in dual layouts provides a greater balance in density and texture between the two scripts (HJLA 53)[199]. Arabic has a more fluid anatomy with wider open counters, therefore in equal-width justified text columns, Latin seems denser compared with Arabic.
- Different lengths of texts due to the nature of the translation in continuous reading need different space or font sizes for each script (HJLA 42). For example, the length or width of a column may become longer for the longer script. Designers need to rely on their visual preference to decide on the best solution.
- Lack of equivalent translation such as titles or subheadings in publications or display layouts puts one script in a secondary position (HJLA 7, 13, 19). The context function and usability, and the economic relationship of coexistence, determine whether this is necessary.

[199] The 'HJLA' images are presented in Appendix 5.

- Vertical presentation of Latin and Arabic, such as in diagrams or display layouts, needs a different approach due to the opposite reading directions (Photo I. 23). Research for this study presented alternative options, as both could rotate to the baseline orientation, or Latin could be stacked. Designers must rely on their visual preferences to decide the best approach according to the ethics of inclusivity.
- In code-mixing and code-switching layouts, the paragraph should end with the script that it starts with, therefore the start and end point use the same script (HJLA 27). Due to the different reading directions of Latin and Arabic, starting with Latin but ending with Arabic influences the reading experience, and vice versa.
- A mix of Latin numerals with Arabic texts in bi-scriptual Latin and Arabic Quran contexts with justified texts results in apparently-inconsistent proportions between the two (HJLA 28). Increasing font size for Latin numerals is not an option, since it causes inconsistency between the Latin numerals used in Arabic texts compared with the same Latin numerals used in the Latin text.

  Designers must have to hand appropriate typefaces including Arabic numbers for Arabic texts.
- Achieving parallelism is a challenge where abbreviations at the beginning of paragraphs in dual texts are concerned (HJLA 29).

  Use of uppercase for Latin indentations provides adequate contrast between the abbreviation and the main text in lowercase. But, due to a lack of different styles in Arabic, it is difficult to achieve contrast between the abbreviations and the main text. In the majority of cases end-position letters are used for Arabic abbreviations. Latin uppercase letters achieve cap height, but Arabic end-position letters do not. Therefore in Latin, the abbreviations are visually recognisable, but not in Arabic. In order to make abbreviations distinguishable at the beginning of paragraphs, various options are available: spacing; use of a different weight of a typeface for both scripts; the use of initial-position letters instead of final-position for Arabic; and the use of lowercase for Latin instead of uppercase may provide a better level of parallelism and equality.

- The hierarchy must demonstrate the role and category of the data (HJLA 49). For instance, titles must take a primary position over subheadings. However, apart from hierarchy, the typeface style and weight play a role in this issue. It is easier in Latin, because Latin has uppercase and lowercase and a variety of weight. However, these are not available for Arabic. Instead, the use of different font sizes, or typeface styles, can be used in practice for this purpose, but it is not advisable. A number of typefaces should always be kept in hand to ensure variety. The use of different font sizes or type styles causes inconsistency in the typographic voice, as in some cases it may seem primary but in other cases it may seem secondary.
- In grouping relevant information, the use of space between title and heading, instead of using different weight and writing styles, could help hierarchy. This is especially the case since Arabic has fewer options within the range of weight and has a lack of uppercase and lowercase style. The use of space for both scripts may aid parallelism.
- Emphasising a specific word mix of upper and lower cases can be used in a sentence for Latin, but in Arabic, the emphasis will be missing, due to the lack of uppercase. Respecting the principle of parallelism, it is important to emphasise both scripts equally. Instead of using uppercase, the use of a different weight may work better for emphasis in dual Latin and Arabic texts.

6.3.4.b. Hierarchy of Information

The hierarchy of information in a bilingual layout was a controversial issue with inconsistencies in the literature review. Some researchers (Rutley, 1976; Chahine, 2012; Maag, 2012) examined the hierarchy of information based just on the visual outcome of the layout and proposed a specific hierarchy so as to put relevant language at the top. This group of researchers considered which language needed to be treated as a priority in terms of hierarchy according to its typographic needs and visual anatomy of letterforms. In contrast, others (Jamson et al., 2001; Jamson, 2005; Kinnear et al., 2012) maintained that Hierarchy of Information should depend on readers' intentions, preferences, experience and background. Therefore, it is not a matter of whether Arabic looks better at the top or on the

right because of the script culture; rather, it depends on the context and the readers to determine whether Arabic should be positioned at the top or on the right. In conclusion, the Hierarchy of Information in the juxtaposition of Latin and Arabic should take into account the reading culture of the script, the readers' intentions and cultural background, and the context.

The influence of the factors below on the Hierarchy of Information is shown by means of the analysis through the course of this research:

- Hierarchy of Information is a method which gives primary status to a script in a bilingual layout. In a vertical hierarchy, the script is on top and, in a horizontal hierarchy, the script that is seen first according to its appropriate reading direction is read first.

  In parallel layouts, positioning Arabic at the left and Latin paragraphs at the right improves the reading experience, since each is matched with its reading direction (HJLA 3, 36).
- In a vertical hierarchy which is more dominant in display layouts, or parallel layouts in continuous reading contexts, the primary status is with the script at the top.
- In horizontal layouts, the text that respects the reading direction of the script and which is dominant in continuous reading layouts, is read first.
- The hierarchy must demonstrate the role and category of the data. For instance, the title must be present in the primary position, before the subheadings. However, apart from the hierarchy, the typeface style and weight play a role in this issue. The principle of parallelism and quality for the Hierarchy of Information plays an important role since it helps in applying equal hierarchy for a relevant text of juxtaposed scripts.
- The hierarchy also takes grouping data into account. Equal hierarchy of grouping information in both scripts improves typographic voice and presents equal visual identity to readers of both scripts. It helps readers to understand in equal measure what the layout is 'selling'.

6.3.4.c. Aligned or justified text

Latin and Arabic have different language structures in a sentence as, having different lengths of words according to their linguistic differences, they have opposed reading and writing directions and different typographic characteristics. Arabic has extra glyphs and does not welcome hyphenation. Because of these differences, the same style of aligned text in a column may suit Latin typographic characteristics, but not Arabic. In deciding on styles of 'alignment of text', a good understanding of the culture of the script is requisite (HJLA 8, 15, 38).

Analysis through the course of this research shows the influence of the factors below on alignment, aligned text and justified text:

- Achieving parallelism and equality in alignment styles of grouped information in a text aids intuitive recognition of relevant information in both scripts. Consequently, the lack of equally-aligned style influences the status of the language and presents it as secondary.
- The use of extended glyphs for Arabic in justified text helps to avoid unpleasant rivers. Also in logo designs, the use of extended Arabic glyphs to match with the width of Latin may be a good approach to provide equality.
- For double-sided alignment of texts within a paragraph (justified text), reduction of kerning with the aim of squeezing the text into a line and avoiding rivers is inappropriate. First it causes disproportionate glyphs and ligatures between Arabic words in a line. Secondly, due to difficulties with technology, it may cause mispositioning of letterforms. For instance, some letters may sit above the baseline and overlap with strokes of neighbouring letterforms.
- Justified text in an Arabic paragraph may cause extra rivers compared with a justified Latin paragraph. This situation would be worse if the width of the column does not take the Arabic script needs into account. For a better understanding, three issues should be considered:
    - First, due to the different width of words, fewer may fit in an Arabic column compared with Latin.
    - Secondly, extended glyphs cannot be applied to all Arabic words.

    - Finally, hyphenation does not apply to Arabic script, because some letterforms in a word are connected. In a justified text, applying extended glyphs to Arabic does the work of hyphenation in Latin. It helps to adjust rivers.

  Therefore, if the width of the column is not enough to host an appropriate amount of Arabic text, the texts in a line may not be subject to extended glyphs and may result in very unpleasant rivers.
- Justified text for both scripts works if extended glyphs are applied to Arabic. However, primary research shows that those cases with very long extended glyphs had readability difficulties, since eyes had to search for the next letter.
- Regarding justified texts, typefaces with Kufic Arabic styles work better, since without the use of extended glyphs, they approach the appropriate level of density in juxtaposition to Latin.
- Primary research shows that a different approach to alignment on a page, as in Arabic aligned right sitting beside Latin justified text, may oblige the text in Arabic to omit content or a message equivalent to the Latin. Therefore it may cause confusion regarding the role of the text, especially for monolingual readers who are not capable of understanding the juxtaposed language.
- Unequal alignment of text between the juxtaposed scripts has an effect on the status of the languages, as it presents them unequally and compels one to be secondary.

6.3.4.d. Corresponding typefaces

Analysis of the primary research and the literature review (Kapp, 2011) shows there are harmonious bi-scriptual Latin and Arabic typefaces designed by experts, but they are not accessible to the public. This means it is up to designers to pair Arabic scripts with Latin script for bi-scriptual approaches.

The literature review showed the most important factor in ‘harmonising script’ is to achieve an overall grey tone. In the choice of typefaces, Kapp comments that certain scripts require more leading, i.e. “looking for similar details within the drawing of the letterforms (the way the strokes are constructed, the proportion of counters, the stroke thicknesses, the fluidity

or geometry of the letterforms)".

The density of letterforms affects the match of the proportions of juxtaposed scripts. For example, Wittner et al. (2020:19) claims: "Latin typefaces with large x-heights (or small caps) best match mono-case or mono-width scripts like Chinese, Hangul and Hebrew. Latin typefaces with old-style proportions with small x-heights (and long ascenders and descenders), however, better match Arabic text faces." The typeface has to match the function of the contexts. For example, some typefaces were historically used for items like newspapers Wittner et al. (2020), selects the non-Latin typeface first, since there are fewer choices and variability in non-Latin typefaces compared with Latin. Finally, the typefaces light in weight, low in contrast, and condensed, are not suitable for continuous reading.

As type designers, Nemeth (2006) and Chahine (2012) explored how, in the juxtaposition of Latin and Arabic scripts, the visual form of each script's letterforms and the typographic layout of both scripts have to find common ground to resemble the same tone and style. Analysis through the course of this research indicates the following will be useful in finding corresponding typefaces:

- The pairing of typefaces for continuous reading must include different weights for each script, since applying appropriate weight for different groups of information, such as titles and subheadings, is important. Both scripts must achieve parallelism between the weight of relevant information. In matching weight, rather than matching the width of strokes, the overall density of the layout must be considered.
- The typeface style must respond to its contextual function. A typeface family in Arabic may have been created for a different function or purpose compared with the paired Latin typeface family. Therefore, in deciding on paired typefaces, it is not just about matching style. A thorough investigation of the history of typefaces is required to ensure they both fit with the function of the dual text. For instance, an Arabic typeface may match with the *style* of a Latin typeface, but it may not be appropriate for readability.
- The lack of similar style and mood between paired Latin and Arabic typefaces in a continuous layout makes it difficult for the two scripts to marry.

- The ethics of inclusivity play an important role in deciding the typefaces. For example, where dyslexia needs are concerned, learning and teaching needs, audiences' ages and local taste are important factors to take into consideration.
- The paired typefaces must deliver apparent parallel size between the two scripts, otherwise it detracts from the density and overall grey of the layout. If the apparent size of one script is bigger, or the typeface that has wider counters makes the script primary due to extra spaces around the text, this could cause excessive eye attraction.

  Depending on the typeface, sometimes a bigger Arabic font helps to achieve apparent size equal to Latin uppercase.
- The Kufic style of Arabic typefaces provides apparent equivalent size to Latin, but it is not appropriate for continuous reading. It is more useful for display layouts and title pages.
- Designers must have to hand several typefaces that include a full set of written elements for both scripts, including letterforms, numerals and punctuation marks. As earlier discussions show, the shape, position and function of numerals and punctuation marks may be different in Arabic compared with Latin, therefore these elements should not borrow from another script.

  In addition, as discussed, language is an element of culture. Use of a script's elements according to its readers' visual experience, helps with clear communication and improves the reading experience, especially for local contexts.
- Designers should look for English typefaces that are more fluid, rather than using Arabic typefaces that are more geometric.
- For Naskh styles, testing reverse 'ى' and for Nastaliq style, reverse 'ن' could provide some guidance about leading needs (Figure 68).

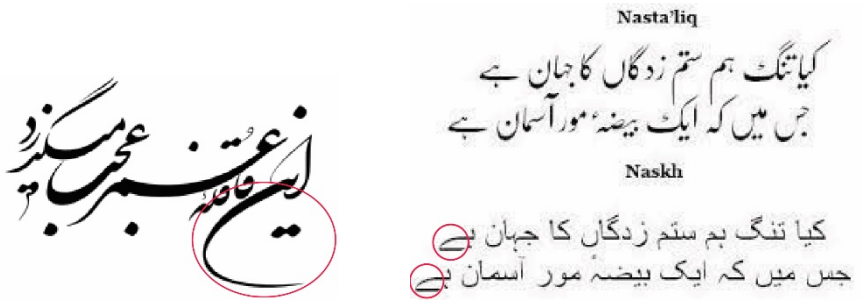

Figure 68. Left: Reverse 'ن' in Nastaliq style. Copyright @ Wikipedia: Nastaliq. Right: Reverse 'ی' in Naskh needs larger descenders and leading. Copyright @ Quora. Lara Novakov 2019. The reversed letterforms in both cases required larger descenders' height compared to the descenders of both letterforms in normal situations. The larger descender height automatically necessitates more gaps for leading between lines.

- The analysis of primary research elaborated certain tips that could help designers to assess readability of an Arabic typeface.
    - Typefaces with equal height of teeth for Arabic letterforms negatively influence readability. Choosing the initial letterform 'sin' as an icon could test the readability of a typeface. The teeth of the initial letterform 'sin' must be higher than the other teeth.
    - The word 'سیب' could be tested to ensure the teeth of 'س' are not at the same level with the teeth of the middle position 'ب' and the final teeth of the final position 'ب' (Figure 69).



Figure 69. Apple 'سیب' in Arabic script written in Adobe Arabic typefaces (top) and Tahoma (bottom). Adobe Arabic typeface is more readable compared to Tahoma as more attention is paid to the different height needs for the teeth for different letterforms, depending on their positions in a word. As presented, in Adobe Arabic four different distinguished height of teeth are considered for the teeth in the word 'سیب', however it is simplified to two levels, which negatively influences the legibility of letterforms in a word.

- The mix of words ‘ابجد هوز حطی کل من سعفص قرشت ثخذ ظضغ’ could be tested to check that the final position letters with different shape descenders have a variable descender line, and check that the dots of different letterforms below the baseline do not align in one line. Typefaces with consistent descender lines have less readability and are less appropriate for continuous reading. They may be a good choice for display layout, however, since they visually have closer apparent size and density with Latin.
- Check the typeface in smaller sizes, to ensure the dots and strokes do not overlap.
- Arabic script has variable shapes of closed and open counters that affect the density and readability of text. They are also a distraction for one’s eyes. Letterforms such as ‘ص’, and ‘ط’ could be elements to test the counter.
- The use of Arabic typefaces based on Naskh or Thuluth, styles that make all letterforms sit on one baseline, provides a better leading compared to calligraphic styles, where letterforms are fluid and sit on variable baselines. Especially in juxtaposition to Latin, the use of fluid typefaces negatively influences density, texture and colour. This is more prominent for code-mixing layouts than a Latin and Arabic mix in a sentence compared with parallel layouts.

- The readability of continuous reading is a key factor, since a huge amount of body textis run together to provide information.
- When juxtaposing Latin and Arabic scripts in a ‘sentence message’ presentation, Latin typefaces with short descender lines, and simplified Arabic scripts with single descender lines, are not an appropriate choice. Typefaces such as ‘Plantagenet Cherokee’, which has a higher descender line, seems a better choice, since it improves readability.

6.3.4.e. Leading, Kerning, Tracking

Analysis throughout this research demonstrates the influence of the factors below on leading, kerning and tracking:

- A typeface with wide-open counters results in bigger gaps between disconnected Arabic letterforms in a word. Manual manipulation is necessary, especially for display layouts.
- Larger leading for Arabic script is acceptable for layouts with vertical hierarchy, where one script sits on top. However, for juxtaposed scripts in a parallel layout that matches facing lines, having consistent leading becomes necessary and plays a key role in the texture of the layout, Otherwise, the facing lines will not align.
- Wider leading for one script, due to the extra space it provides around letterforms of a script, results in inequality between the status of the languages.
- Analysis of historical bi-scriptual publications shows tracking is a popular approach for titles in Latin script. Tracking is not possible for Arabic, however, since letterforms are connected. For a parallel approach and in order to achieve balance of density and texture, kerning and manual spacing between disconnected words must be applied to Arabic instead.
- Vocalised Arabic type needs more leading. Assigning bigger leading to juxtaposed Latin would not help parallelism however, since Arabic gets more density due to extra vocalisations. Different leading for Latin is required. The use of vertical hierarchy may help, since it diminishes the need for matching facing lines.
- The role of using consistent style and apparent size between the scripts is important in a more prominent code-mixing layout compared with parallel layout, since a lack of consistency can occur in a code-mixing. This results in unequal leading between the lines of a paragraph.
- Manual adjustment of leading and kerning may be required according to the readability needs and culture of the script.

6.3.4.f. Adaptation to technology

This discussion on the history of technological development to support Arabic script is important since it may be a reason for poorer design quality in Arabic typographic approaches compared with that of Latin script typographic scripts. As Boutros demonstrated, technology was not friendly to Arabic script, since, in all cases, it was set according to the proportion and anatomy needs of Latin script, and Arabic with very different heights and proportions had to fit the technology designed for Latin (Houwing and Grenier 2005; Kapp, 2011). However, the history of technological development and acknowledgement of how it developed seems a valid tool for typeface designers to understand how Arabic typographical challenges are fixed and managed to adapt to new systems. Nevertheless, I believe it may not be necessary for graphic designers. Technology is improving rapidly and how it is supportive of Arabic script nowadays is totally different compared with years ago or even, probably in the near future. The important point is that designers must keep up-to-date with technologies that support both scripts and typographic characters[200]. As Leonidas (2015) states, it is necessary to understand the technology and 'knowhow' in working with different scripts.

[200] Boutros (2009) shed light on history and development of technology in supporting Arabic language, including Letraset, Grapheast, URW, Diwan (Apple), QuickDraw, Microsoft, OpenType and its history, WinSoft & DecoType, and more.

Chapter 7: Conclusion, Limitations and further development

7.1. Research Conclusion

This study is a response to the needs of societies today, welcoming people of different cultures, via bilingual typography. Presenting a detailed analysis of the influences that bilingual typography has on society provides clarification about the wider role that designers have in societies. The arguments about the role that a bilingual typography has in the socio-cultural aspects of societies has proved clearly that it has seriously changed the designers' responsibility. Designers are no longer just decision-makers of typographic elements for the purposes of aesthetics: they have a bigger role to play in changing society's mindset about different cultural identities and easing communication between two distinct cultures. This puts a heavier responsibility on designers' shoulders to deliver a high-quality design outcome, since an inappropriate one would negatively affect the status of the culture. Bilingual typography has changed the role of designers, since they play an important role in establishing the cultural identity of audiences in multicultural societies.

Interestingly, the research shows that although the world has become a global village, multiculturalism from at least one aspect is leading the world towards globalisation. Since language is a strong element of culture, multiculturalism in reverse is encouraging local communities to preserve their language elements in different strata of cities. Therefore, as this research shows, globalisation has not led to a monolingual system, rather, it has encouraged bilingualism. Many societies that have adopted Latin script as their official language welcome bilingual typography in different layers of their societies, nonetheless. However, globalisation encourages the adoption of t the best practices from other cultures, and despite cultural and social disadvantages that the adoption of Latin provides, this study

shows that this significant step assists greatly with the simplification of written elements of societies, including those whose *lingua franca* is Arabic, where technology was not friendly to their visual forms.

The analysis in this research has clearly highlighted the disadvantages and advantages of Latinisation, specifically in respect of the context of its use. It also encourages designers of Arabic script to detach themselves from traditional calligraphic approaches and opens paths for creative new methods. Now is the time to respond to the needs of societies by considering audiences' cultural differences. Thus, attachment to religious and calligraphic approaches for bilingual layouts may not represent the true culture of today's Arabic script readers.

Despite the long story of the juxtaposition of Latin and Arabic scripts in historical publications, and despite the ubiquity of these two scripts' coexistence at different levels of societies worldwide, this research has demonstrated that there is a lack of training and guidance for working with these two scripts in the arrangement of texts. In this connection, analysis of primary research shows a poor design approach in the coexistence of Latin with Arabic. Further research aimed at learning from typographic research related to the coexistence of other scripts reveals a bigger problem, namely that bilingual typography itself has never been the focus of academic research, and there a lack of overarching guidelines in bilingual typography compared with monolingual. Bilingual typography only gets less than two pages' attention in some typographic books.

This research for the first time addresses bilingual typography as a new self-contained field of typography and investigates the different typographic concerns that arise because of the different role that bilingual typography plays, due to its bilingual features, in societies, as compared with monolingual typography. As a result, this thesis proposes a new categorisation and provides clarification on why each category needs a different typographic treatment. It opens up the path for future research to investigate operating principles for each category.

However, due to the limitations of time, the focus of this thesis has been on the category of 'bi-scriptual typography'; furthermore, a decision was made to provide guidance for improving the design quality of bi-scriptual Latin and Arabic typographic layouts, since

typographic needs of different scripts are very different from each other, also calling upon my own background and experience.

As a result of the literature review, and of my primary research, this study proposes guidance to achieve high-quality design which is called 'visual excellence'. This method of principles is based on an analysis of context that respects the importance of principles and typographic elements, but simultaneously respects designers' tastes and fashion; local and global needs of societies; and readers' ethical and cultural differences. The principles' role here is different from those seen elsewhere in the field, since it is not just about guiding designers on how to tackle typographic problems, but it also emphasises the importance of designers' awareness of the influence of a bilingual approach on a society and makes them understand their wider role and responsibilities.

Although the outcome of this research is aimed at improving the design quality of typographic layouts in the juxtaposition of Latin and Arabic, it may be applicable to any bilingual approaches to the juxtaposition of foreign languages, depending on the their typographic similarities with and differences from Latin or Arabic scripts, as well as any other bilingual categories which may be introduced, including other typographic environments. My research benefited from scholars' investigations into other scripts, and I hope that researchers focusing on further scripts will similarly learn from my findings in this study.

7.2. Research limitations and further developments

The main limitation for this research was the difficulty of access to any publications that might exist among local Arabic script users. Due to political and economic issues in some Arabic script regions, the access to the global internet is limited, leaving researchers with a lack of expert communication in those regions. In addition, many publications dealing with working with Arabic script are written in the Turkish language. Unfortunately, my restricted understanding of Turkish limited my ability to learn from such publications. This research is therefore primarily targeted at an English-speaking audience.

As a further development, this study has identified potential research for the future, as listed below:

- The effect of bilingual typography on societies and consequently on the change of the designer's role became of interest to an organisation in Paris, in cooperation with whom, a brief to conduct post-doctoral research on the subject is being developed.
- Individual categories proposed in this research for different typographic environments, in asynchronous bilingualism and in mono-scriptualism may need different principles, and yet other considerations. Therefore further research on current guidance is needed to achieve a similar 'visual excellence' for each of the identified typographic categories.
- The analysis of context in this research is proposed according to the contexts in which Latin and Arabic scripts coexist, although it has potential to be expanded for bilingual approaches in other scripts. Researchers of other sets of scripts will have to investigate the relevant context of the scripts according to their similarities with and differences from the context identified in this research. I hope this research has opened the path for future investigation into the juxtaposition of other scripts.
- The section on the anatomies of letterforms provided a detailed analysis of the needs for a new method of separately presenting both Arabic and Latin nomenclatures. In addition, it threw up a new need for nomenclatures for bilingual approaches. Whilst undertaking research into the anatomies of letterforms to conduct this research, I found in the process that there are further gaps in this area that create scope for further research.

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Appendix 1: Definitions

This Appendix includes existing terminologies, but they may refer to a very broad connotation which needs to identify the aspect that are remit; or the terminologies that exist but different designers used them to refer to different things.

The scarcely of holistic text-based academic discussions and analysis on 'bilingual typography', leaves designers with a lack of appropriate terminologies and definitions. This provides a challenge for this research, that the readers of this research, first may not gain a common understanding of the field of practice that I defined as 'bilingual typography' and its subcategory of 'bi-scriptual typography'[201]. Secondly, they may not gain a common understanding of this research discussions.

The problem is, available popular typography books mostly discuss about the typography system of one specific script – monolingual typography –, like Latin or Arabic. With this respect, some terminologies exist in the field of monolingual typography which are perfectly applicable in the field of bilingual typography because the languages are appropriate to be used to address the same typography issue in bilingual typography. These applicable terminologies include general terms refer to adjustment of typography elements in a typography layout regardless of the characteristics of a specific script. For example, 'kerning' or 'leading'. Therefore a few groups of terminologies could be borrowed from existing typography sources.

However, in some cases, the terminologies used within monolingual typography are misleading to use for bilingual typography, mainly because in the field of type design and typography, there are some words whose meaning has changed or evolved through use, for example 'family typefaces'[202]. Also due to the lack of an agreed set of language to refer to specific aspects of a typography layout, different designers are using the same terminologies to refer to different issues. This causes substantial ambiguity results in most designers with current nomenclatures to not understand the bilingual layout's contexts fully (Gokhale,

[201] Report on bilingual typographic practices and articles on coexistence of foreign scripts in different societies, (AbiFarès 2001.2010,2016; Dixon, 2002; Blankenship, 2003; Papazian, 2004; Nemeth, 2006; Pelli et al., 2007; Kapp, 2011; Maag, 2012; Baki, 2013; Balius, 2013; Paek, 2014; Wittner et al., 2020; Leonidas, 2020), did not provide a clarified definition about 'bilingual typography'. More information about the differences provides at Chapter 4.

[202] The research shows typographers used 'family typeface' to refer to different typographic issues in mono-lingual typography compared with bilingual approach. For clear examples are refer to Section AP1.5.b.

2019).

On the other hand, in some categories of bilingual layout such as, juxtaposition of Latin and Arabic, the very distinct and different characteristics in the anatomy of letterforms add new typographic elements and features to a bilingual layout, which are exclusive and unique to a bilingual layout. These issues do not exist in monolingual typography. Therefore, a totally new set of definitions, classifications and terminologies are needed to refer to this unique feature or typographic elements. With this respect, despite the first problem where a terminology exists but because it is misleading it needs extensibility and standardisation; within the second set of problems, the field of bilingual typography excludes any terminology, since this field has not been defined and classified yet.

In addition, I experienced difficulty of mutual understanding of discussions on my research topic, when I presented my research on few international conferences worldwide[203] to audience's with experience of creating type design for their local language.

To pave the path for gaining a mutual understanding of discussions on 'bilingual typography' for the sake of this research and future communications, this research provides clarification on definition of 'bilingual typography' and appropriate terminologies. Due to the scarcely of resources on providing clarified notion of bilingual typography and terminologies, this research attempted to provide clarification on definition and terminologies, by investigating relevant fields such as 'monolingual typography', 'linguistics' and 'socio-linguistic'.

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[203] 8th Jan 2023 The 8th IAFOR International Conference on Education (IICE2022), Honolulu, Hawaii, USA SESSION JUDGE Session title: Curriculum Design & Development.

- 6th – 9th Jan 2023 the 8th IAFOR International Conference on Education (IICE2022), Honolulu, Hawaii, USA Publication Title: Deliver a WBL multidisciplinary module for Level 5 foundation degree students in Computing Technology.
- 28th Feb – 2nd 2020 13th Typography Day 2020, Applied Science Private University, Amman, Jordan Delivered a one-day typography workshop on 29th Feb 2020.
  Delivered a presentation on the subject of bilingual typography and its categorisation on 30th Feb 2020.
- 4th Jul 2019 Theorem 2019, Anglia Ruskin University: Cambridge, School of Art, United Kingdom, Presentation and Publication Title: Creating new agreed system of principles to achieve visual excellence in design quality of bi-script typographic composition including juxtaposition of Latin and Arabic scripts.
- 7 19th – 21st Jun 2019 (ICTVC 7) International Conference on Typography & Visual Communication, Institute for the Study of Typography & Visual Communication, Patras, Greece. Presentation and Publication Title: Lack of visual excellence in design quality of bi-script typefaces including Arabic and Latin scripts.
- 2nd – 4th Mar. 2019 12th Typography Day 2019, IITC Centre, Mumbai, India. Presentation and Publication Title: Lack of visual excellence in design quality of juxtaposed bi-script typographic 23rd Apr 2018 Change Agent Network (CAN) Conference Winchester University. United Kingdom. Presentation Title: *Students Technology Mentors and staff working together to build digital capabilities. It was p*resented with Learning and Teaching Innovation Centre at UH.
- 12th – 16th Sep. 2017 Atypi 2017, Montreal, Canada. Title of the Discussion Panel: Anatomy of Letterforms (Latin Script) The trip was funded by University of Hertfordshire.
- Nov. 2016 Multiscript typography for a global Citizenship, Universiteit van Amsterdam, Amsterdam.

Accordingly, as Haley et al., (2012:189) discussed,

> "most professions develop their terminology to facilitate communication of thoughts and ideas. All design practitioners need to be well versed in the language of typography so they can communicate clearly with one another, especially with others who work with typography or lettering. Designers also often need to explain their creative choices to those who do not have expertise in typography, and being able to champion and explain their design choices is an essential part of that process. Fluency in the language of typography indicates knowledge of the field, and ability to educate clients, and the capacity to help others appreciate the work of a type of designer."

AP1.1. Typography

A holistic approach on typography's definition, its practices and approaches

David Jury, a typography and academic on the subject of 'typography'; in his book 'what is typography', explored the development of typography in light of the development of digital technology (Jury, 2006). Per Jury's observations, digital technology has two significant effects on typography. Firstly, typography becomes more general detaching from printing industry (Walker 2001; Jury, 2006,). But nowadays, an important element to consider in typography is 'written material'[204] (Jury 2006).

It implies, no matter if the arrangement of the written material has been created manually without involving the printing industry, or if it is created digitally and has been printed, or if it is not printed and is available on a digital screen, it is still called typography. However some texts use the term 'lettering' for hand-written or hand-drawn typography.

In addition, practices and research on Kinetic Typography (Brownie, 2015) and typography in public (Kisman et al., 2010) show typography could happen in the temporal environment,

[204] Written material is open to interpretation. Jury has not clarified what he means by written material, but analysis of his book implies that he is thinking of texts. Walkers (2001) used the 'letterforms' to emphasis on the element of text on typography, And Southhall (1988) used the term 'marks' to deliver the same impression.

including installation of types as an architectural instalments with any texture, it is still typography as long as it could be recognised as a readable text/letterform in a specific angle. Therefore, typography is no more restricted to a tangible surface or material[205].

As the above discussions imply and as Jury (2006:9) states, 'One key element of typography is ''written'' elements.' But the 'written' no longer only refers to the 'handwritten'' as it primarily does (Jury, 2006). Digital technology provides multiple methods of presenting written languages such as email and text messages, and as Jury (2006:9) claims, "the word 'typography' subsumes all these methods of communication."[206] However, in this research typography considers arrangement and designing of written elements with professional consideration of layout's function, its objectives and audience's needs; the typography that designer's role in an appropriate design quality is evident. Therefore, not every written practice such as mere use of text-based communications would be considered as a practice of typography at this research.

Secondly, Jury shed light on the effect of digital technologies on enabling everyone to create a typographic layout, since the arrangement of written material may be made by 'typographers' or 'without them'. Jury (2006:7) distinguished typographers from non-typographers as 'in a professional capacity or recreationally.' Some may discuss the text-based signs, love carts, window-shop messages, handwritten emergency messages were considered as typography since time immemorial which implies the creators of these layouts such as workmen, business owners or lovers without any expertise or educational

[205] Per the function of a typographic layout in a static print environment, text may present on a variable solid material. Printing companies separate from providing different texture and thickness of papers; they also offer various materials, including vinyl, plastics, Foamex (PVC Foam Board), Aluminium, Plexiglas, Correx, Foam core, cardboards etc. Besides, the text may emboss or engrave on the material which brings a new aspect to the print outcome which is a natural cause of light 'shadow'. The shadows may have effects on the legibility of the texts. In addition, individual letterforms may be cut separately and installed in the juxtaposition of each other to present a name which is called 'CNC'; like the Shop signages. Although the texture and thickness of the material may affect the delivering of a message attached to a specific emotion, but the visual characteristics of the same text including, the 'size', 'colour', 'style' and 'form' on any of the above mentioned materials remain the same over the time. Audience action for reading the text over any of the mentioned materials is the same. For example, presenting a name in the English and Arabic languages on a paper, or Aluminium or Correx just required the knowledge of the reader to read and understand the English or Arabic language. Therefore, material is not an objective of this research because the level of effect that it has on the relationship between the audience and the bilingual layout is minor to the effect of material texture on delivering a message with specific mood, which is considered as the effect of print techniques rather than design or typography principles.

[206] A concern arises if an established typography convention could be applied to typographies with a different method of written communications? Or, as the effect of digital technology conventions or principles has to be defined per the analysis of the method of written communication? The answers to these questions will hugely affect the outcome of this research and will be discussed and analysed in more detail in the next chapters. As Sue Walker (2001:14) states: 'Historical study of conventions in typography, such a study would include a wide-ranging survey of practice to see what devices are widely used and understood.'

knowledge in the typography eligible to refer to as 'typographers' even before the digital era. Although the later view has credit, but Jury's discussion reveals a valid point that the growth of digital technology enables every individual access to computers to do typography with fewer skills ever needed[207].

Similarly, The head of the Department of Typography and Graphic Communication at the University of Reading, Sue Walker (2001) on her book *Typography and language in everyday life: prescriptions and practices*, in defining 'typography' has a similar view with Jury that due to the development of technology, expert typographers do not just control the shape of current graphic language and typography. Still, non-expert typographers play an essential role in shaping the existing visual languages[208]. Thereby, 'typography' is no more restricted to the work of 'typographers', but includes the typography created without typographers. This research aims to propose principles that guide not just identified typographer's practice, but those non-typographers whose practice is shaping the field[209].

Dr. Hilary Kenna, a Lecturer in Design & User Experience at the Institute of Art and Design + Typography in Ireland, on his P.h.D research on screen typography, *A Practice-led Study of Design Principles for Screen Typography – with reference to the teaching of Emil Ruder*, dedicated a short section on definition of typography. In defining the typography, she raised an ubiquitous discussion about the difficulty of divorcing typography from the practice of Graphic design. As she demonstrates, historically designer Emil Ruder (1967, in Kenna 2012:28), states, "Typography and design are virtually synonymous." However historically and contemporaneously researchers (Tywman, 1968; Jury 2001) agreed on this invalid point to not divorce typography and graphic design rely on the fact that both typography and graphic design involve the arrangement and structure of elements. Although arrangement of elements is the main activity in both disciplines, but there is a district variety of principles that apply on arrangement of image and text – Graphic Design – compared with

[207] For example, even for writing a manual text-based message or love card, a person with good handwriting and confidence in finalising the layout with fewer errors or less needed to repeat the job was always needed. But for writing the same message using computer-based software such as MS Word, the person's written hard skill is not required, except his knowledge in using computers. The facility of deleting and retyping without too much time or cost consuming improves individuals' confidence to arrange any written material.

[208] As literature review shows (AbiFarès, 2001; Almusallam, 2014) new knowledge emerges through practice, and is sometimes not recorded in academic texts, and so that is why you are looking at both theory and practice when identifying the gap.

[209] These group of people needs more training, since as Almusallam (2014:3) claimed, there is a lack of training sources for beginners of Arabic practitioners outside of school settings.

arrangement and design of texts and written elements – typography –. In this regard, AbiFarés (2001:16) mentioned "A good typographer is simply someone who works between these two specialised fields – Type Design and Graphic Design –, and who entertains a sensitive understanding of both."

Kenna argues that previous broader definitions of typography regarding the production methods have been affected by technology (Kenna, 2012). For instance, author and typographer Ellen Lupton (2004:8, states in Kenna, 2012) claims "Typography is a tool for doing things with: shaping content giving language a physical body, enabling the flow of social messages." However, Kenna (2012:28) comment more on the practice of typography that the textual matter proposes a 'meaningful aesthetic' layout for the 'primary function of the communication.'

Kenna's view on having a meaningful 'aesthetic' visual form is in contradiction with recent comments on the role of designers including typographers as a responsible and sustainable designer. Graphic Designer, Sophie Thomas (2019) creator of Thomas and Matthews, on a panel discussion with D&AD on *How creative industries can impact the climate crisis?* comments previously, with a design, we aimed to sell a product to people who do not need, with the money that they do not have, to get people who do not care. But our role has changed and as graphic designers we have to be responsible citizens. Our design should provide proper and good ideas to affect the ways that people live and eat (Thomas, 2019).[210] This means a designed typographic layout should go beyond the aesthetic aspect; propose a holistic approach, remain sustainable and respond to the eco-social challenges of our time and have effective communication with readers.

Per Jury's (2006) observations, a few factors that play an important role in identifying a work as a 'typography' include professional practice in conciliating between the content and the readership and adapting it to the function in a specific social context. Jury's definition restricted 'typography' to practices in which written elements are a bridge between the reader and the meaning of the text, which implies easing the reading conditions is the main factor. But practice of typography is not limited to this. In contrast, 'expressive typography' is a worldwide practice that provides the pleasure of feeling and gazing rather than reading.

[210] With this regard also Vaughan Hudge (2015) in a TEDex Talk comments it is the time to shift our perception to what art and design is capable of being beyond, being a decorative element of our life.

As typographer and tutor, professor Ozden Pektas Turgut (2017), in her article *Expressive Typography as a Visualisation of Ideas*, defined "Typography carried out as a visual communication tool not only in the function of reading but also in form. In this context, expressive typography is an art form where text is highly visual, or type becomes an image. Letters are not just abstract symbols, carriers of meaning; they are also real, physical shapes."

In this research the principles for 'typography / typography practice' address the practices that the written elements are a bridge between the reader and the message. The function of the layout readers to read the text and ease reading conditions. It is out of the scope of this Expressive bi-scriptual typography practice. It may be an interesting field of study for future research.

Finally, Walker (2001) in defining typography, emphasises the critical element of 'letterform' rather than 'text'. As she (2001:2) states: 'typography' is concerned with how letterforms are used: with how they are organised visually regardless of how the letters are produced.' Although it is apparent that Walker's use of 'letterforms' was intended to distinguish the method of written communication by using letterforms from all other interpretations that 'writing' is open to, such as writing could refer to using conventional graphic marks for intercommunications. So, her emphasis was on that Typography is an arrangement of 'marks' rather than the arrangement of any 'written materials' that may use conventional graphic signs. Walker (2001:10) defines 'marks', as, 'include characters of any particular script, punctuation marks, and other characters and devices.' But from her definition, we can extract that typography is not just refer to the arranges of a wide range of information such as words or blocks of paragraphs as we may know as 'text', but the arrangement of one letterform or few ones to articulate the information or demonstrate a shape or express a feeling is also called typography. In the field of bi-scriptual typography, it is a versatile practice to use individual letterforms of different languages in a layout, especially for logo designs, and training courses as researchers of bilingual typography (Dhawi, 2017; Zoghbi, 2015) shed light on the identification of factors that plays an essential role for those specific bilingual typographic contexts.

The head of the Department of Typography and Graphic Communication at the University of Reading, Sue Walker, published widely about 'typography'. In defining typography, she (2001:2) states: "The word 'typography' is traditionally associated with a design using type

and the design and production of the type itself." Her views follow Simons (1954 – cited in Kenna, 2012) adds a new factor to the notion of typography that it does not just refer to the arrangement of texts as Jury's discussed, but also similarly to Kenna (2012) includes practices on the production of the type. Kenna's (2012) analysis of famous type designer Fredric Goudy's Manifesto on 1931, *I AM TYPE*, interprets the role of typography in affecting the written communication and printed world, as design of letterforms. Her interpretation conveys that Goudy's definition of typography as a vast application that affects the world on all written communications from poetry to branding, is due to one of the typography's roles as designing the letterforms.

AP1.1.a. Remits of this research:

At this research the literature review shed light on all kinds of typographic practices including, those practices about type design, research on type production, and those focus on arrangement of texts and letters. However, the aim of this research is to propose principles only for bilingual typography practices involving arrangement of text or letters, regardless of how the types were produced. We are not aiming to propose solutions for creating a bi-scriptual typeface design. Although, the outcome may be useful for production or creating bi-scriptual typefaces for a specific bi-sciptual context.

We focus on arrangement of written material by typographers to mediate between content and readership, and adapt to the function per the social context, in any method, on surface or material. This research focused on bi-scriptual typography that invites readers to read the text by creating appropriate reading conditions.

AP1.1.b. Informative typography

To distinguish the typographic practices that involve arrangement of written elements, create a bridge between the message and readers by facilitating reading conditions, from other kind of typographic practices such as 'type design and productions', and from 'expressive typography', I use the term 'informative typography' at this research. In this research 'informative typography' refers to both practices that include arrangement of short or long texts, and also letterforms in all contexts.

AP1.2. Monolingual, Bilingual and Multilingual typography

The terms 'monolingual, bilingual and multilingual' have been defined in the field of psycholinguistic and sociolinguistic but not in the field of typography. Therefore, in defining these terms in typography, we are influenced by the definitions available in these two fields.

AP1.2.a. Monolingual, Monoglot, or Unilingual typography:

Per Charlotte Kemp (2009:13, cited in Aronin and Hufeisen, 2009), define monolingual as the use of one language which could happen in several different varieties of the language together with different registers in the variety or varieties they know, and of switching between varieties and between registers in the appropriate context. 'Monoglot' and 'unilingual' are alternative terminologies used for monolingual in other contexts such as language planning (Tchoungui 2000, cited in Aronin and Hufeisen, 2009) and psycholinguistic and language learning research (Ianco-Worrall 1972 and Ramsay 1980 - cited in Aronin and Hufeisen, 2009)[211].

'Monolingual typography', 'Monoglot Typography' and 'Unilingual Typography':

These terms refer to the typographic layouts that include only one language without different variant of the language. It's reader they all speak in the same language and same variety of the language. It means the typographic layout, excludes variant writing elements. In this research 'monolingual typography' use to refer this phenomenon.

'Monolingual Reader', 'Monoglot Reader' and 'Unilingual Reader':

These terms refer to audiences, users and readers of a typographic composition, who are only capable of reading and understanding one language only one variety. In this research 'monolingual reader' is used to refer to this group of audiences.

[211] For more information about different views on the use of 'monolingual', 'monolinguality', 'bilingual' and 'bilinguality' according to different traditions, see Li and Moyer (2008), and Aronin and Hufeisen (2009).

AP1.2.b. ‘Bilingual Typography’, ‘Extended-diglossia Typography’, ‘Diglossia Typography’:

Research by Kemp (2009:14) shows, “‘Bilinguals’ are often described as persons who use two languages, and bilingualism is the ability to speak two languages or habitual use of two languages colloquially.” This statement emphasises verbal communication skills, while Li and Moyer’s (2008) definition refers to any active or passive communications, which could include writing practices[212].

She shed light on the desire to use different terms at different times to distinguish between individuals and societal use of two languages. Per Kemp’s (2009) analysis, few socio-linguistic researchers such as, Weinreich (1953:67), Lambert et al., (1968:484), and Harms and Blanc (1989:60) – all cited in Kemp (2009) – used the term ‘bilingualism’ to refer to societies whose communities use two languages, and ‘bilinguality’ to refer to ‘the psychological state of an individual’ who knows two languages. Fishman (1967:34, cited in Aronin and Hufeisen, 2009), used the term ‘diglossia’ to refer to when ‘two or more varieties of the same language are used by some speakers, under different conditions.’ Per Kemp’s analysis, diglossia initially understood the use of varieties of the same languages or as bilingualism use of different languages. But Fishman used the term ‘extended diglossia’ to refer to the use of different languages and ‘diglossia’ to use varieties of the same language. Kemp concludes that because of political and cultural factors on the distinction between languages and variety of them, ‘diglossia’ nowadays refers to when users use a language differently or when two different languages use. Still, “there is a particular relationship between these related or unrelated languages” (Aronin and Hufeisen, 2009) concerning their use. The point is that two languages relate to each other or not plays an important role in bilingual individual’s behaviours and brain function. Therefore, different terminologies are used to refer to different situations of bilingualism depending on the relationship of the languages. The same phenomenon is true in typography, since different typographic elements and considerations needed for languages that their written elements relate to

[212] Li and Moyer’s (2008) definition could be considered as the pioneer in defining bilingualism, but it could not be considered as a contribution towards typography. As discussed earlier, typography at this research refers to arrangement of texts, distinguished from any other written practices. Therefore, not every writing including two languages could be considered as a bilingual typography practice.

each other and visually are similar, compared with those that the two languages do not share any common feature between their written, visual forms[213].

'Bilingual Typography', 'Extended-diglossia Typography': These terms refer to typography that includes two distinct sets of languages, or two varieties of one language. For instance, Farsi is used as Pashto and Dari each with different grammar and accent. Readers of bilingual typographic layouts may be readers of one language or variety of a language, or both.

'Bilingual readers': Audiences, users and readers of a typography, who are capable of reading and understanding the two languages used on the bilingual layouts. The readers of a bilingual typography are not necessarily bilingual. In fact, the existence of monolingual people is the reason for bilingual typography, otherwise there is no necessity for bilingual typography. However, the reader could be bilingual, but not capable of reading both languages on a bilingual typography, such as a bilingual English – French people read a bilingual typography including English and Arabic. Or they may be readers of both languages.

AP1.2.c. 'Multilingual Typography', 'Plurilingual Typography', 'Polyglossia Typography'

Typography that features more than two distinct languages or more than two varieties of a language within a single composition. At this research the term 'Multilingual typography[214], used to address this phenomenon. [215]

In the article by Charlotte Kemp (2008:9, cited in Aronin and Hufeisen, 2009) on 'defining multilingualism', states multilingualism could be defined differently compared with bilingualism based on two reasons: including 'those deriving from participants' complex situation concerning the nature of their use of various languages, and those deriving from

[213] This is another reason for the necessity of categorising the field of 'bilingual typography'. Analysis and details of these situations are available on Chapter 4.

[214] Research on socio-linguistic shows certain researchers such as (Saville-Torike, 2006; and Mackey, 1962:27 – both cited in Aronin and Hufeisen, 2009) agreed the numeric scale of using languages is meaningless in differing users; therefore, Saville-Torike (2006) used monolingualism as the use of one language, and used multilingualism as the use of more than one language; differently, Mackey (1962:27), used monolingualism as the use of one language, and used bilingualism as the use of more than one language.

[215] In the field of linguistics, the term 'Polyglot' is used to refer to 'multilingual' individuals (Kemp (2009:15). However, in typography, 'Polyglot typography' is interchangeable to refer to both bilingual and trilingual layouts. 'Plurilingual' and Polyglossia and triglossia are other terminologies used as an alternative (Harry, 1992; Kaye, 1994 – both cited in Kemp 2009) – Aronin and O' Laorire, 2004 – cited in Aronin and Hufeisen, 2009 –).

researchers' differing backgrounds, ideologies and purposes.' Reflecting on Charlotte Kemp (2008:9, cited in Aronin and Hufeisen, 2009) this fact in the typography, bilingual typography could be seen from three different aspects: the readers, the researcher, and the bilingual layout itself.

AP1.3. Readability

Academic Graphic Design tutor and Researcher, Stuart Gluth (2014) in research about typography and research-led practice, emphasised on the importance of readability in typography. He describes the process of readability involving at least three human distinct characteristics. Firstly, there is the physical structure of the eye, which includes focus, movement, sensation, and resolution. The very small part of the eye that is high enough in resolution to decipher type, the fovea (only about 15% of the visual field), is seen as a major limitation for the speed of reading because of the need for repetitive saccadic jumps between focusable areas of text (Dehaene, 2009; Pelli, et al., 2007). Secondly, perception is the neurological structure and processes that allows the information to be resolved, interpreted, remembered, made sense of, and stored. As Stanislas Dehaene (2009) and Pelli, et al., (2007) point out, this 're-assembly' of the 'bits' that the eye sees are an incredibly complex and multi-function process, but is essentially the same whether you are reading Mandarin or English. Thirdly, the psychology of perception relating to cultural experience, conventions, socialisation and human learning, such as the ability to recognize and read poetry or traffic signs, Arabic or Latin, or decipher the Kanji writing system.

One of the critical characteristics we need to consider is the 'non'-conscious nature of reading. According to Dehaene, (2009), we no longer sound out or read all the letters of a word or even a familiar phrase as we did when we were learning to read. The black squiggles on the page are directly transferred into ideas in our brains without us being aware of the process'. The process has become 'unconscious' (Dehaene, 2009). In fact, it becomes very difficult to read if you try and make yourself aware of the process while you are reading, as it intrudes dramatically into our ability to absorb the ideas, indicating how non-conscious it has become. While this is now much more contentious (Thurgood et al., 2010), this possibility may be particularly germane to the nonconscious process of reading,

which may be seen to be an equally ‘vulnerable’ process. This may be true of many such human factors and cultural values. Then again, based on personal observations, I can also say that many designers tend to ignore these issues, do not question them, or are not aware of them {i}. For that reason, designers need to consider what happens when the reading process is interrupted by poor legibility or readability, or how this affects people’s non-conscious evaluation or attitude to what they are reading.

AP1.4. ‘Display typeface’ – ‘Body-Text typefaces’

AP1.4.a. Display typefaces:

Strizver (2014) defined ‘display typeface’ as “type set larger than 14 point is usually considered to be "display" type, whether it appears on a billboard or poster, a book jacket or other packaging, or an advertisement in a magazine.” As Strizver observed the display typefaces may reduce the legibility and readability of the text in favour of aesthetic expression. Usually, display typefaces are only available in a limited range of characters. For example, a version of Latin display typeface, might only be available in UPPERCASE letterforms. The display typefaces are only used for titles or texts above 14pt (Strizver 2014).

AP1.4.b. ‘Body-text typefaces’, ‘text typefaces’

As expressed by Wilson (1993), “body text is the text forming the main content of a book, magazine, webpage, or any other printed or digital work.” In this case, the typefaces used in a body text should include non-alphabetic characters such as special characters, numerals, mathematical and punctuation marks to provide the same style within the typeface. I call these groups of typefaces body text typefaces or as Strizver (2014) called them ‘text typefaces’, which are usually provided by type foundries including all the Standard Unicode characters that are needed for the written form of a language. They are used for any text, from a very small font size like 6pt.

AP1.5. ‘Type family’ vs ‘bi-script typefaces’

The term ‘type family’ refers to different notions in monolingual Latin typography compared with bilingual typographic contexts.

The academic and typographer Gerry Leonidas, in a design panel discussing the challenges of bilingualism in typography, observed that ‘designers discussing the global state of non-Latin’ type, published in *Eye* magazine, used the term ‘type family’, to address typefaces that are available in more than one script. According to Leonidas (2015:81), “on one level we have seen the concept of a type family evolve. The most interesting developments have been in extending the concept of the ‘type family’ across scripts.” Similarly, the type of designer, Pascal Zoghbi (2015) in an article discussing approaches for simultaneous design of Latin and Arabic typefaces, addressed the Google ‘Adobe Arabic’ typeface as ‘type family’, since it is available in Latin and Arabic scripts. Nemeth (2006), on the analysis of typeface approaches for bilingual Latin and Arabic scripts used the term ‘type family’ similarly to Zoghbi and Leonidas.

In contrast, related to the definition provided for ‘type family’, by graphic designer and writer, Timothy Samara (2004:19), type family has nothing to do with the variation of scripts available with a typeface. It refers to variable widths and thicknesses available for a set of letterforms within one typeface like, ‘regular’, ‘italic’, and ‘bold’ weights. Samara’s discussion demonstrates that if a typeface includes different weights and styles, no matter if the typeface is available in one script or more than one script, the typeface could be referred to as a ‘type family’. Similarly, texts provided guidance for monolingual typography with Latin script used the ‘type family’ with the same understanding as Samara.

The use of ‘type family’ in bi-scriptual texts for a new notion might be due to the lack of terminology in the field of typography for this phenomenon. Since available typefaces in different scripts do not play any role in mono-lingual typography, there is no term to define such a phenomenon. Also due to the lack of research and analysis in the field of bilingual typography, the practitioners borrowed terms from the monolingual field.

However, since in this research both notions play an important role, it is important to distinguish terminologies for each notion to ensure readers of this document gain a common understanding. Therefore, I coined the term ‘bi-script typefaces’ to refer to

typefaces available in two scripts. Consequently, used new terms ‘mono-script typeface’ and ‘multi-script typefaces’ depend on a variety of scripts available within a typeface.
I use the term ‘type family’ as defined in the field of mono-lingual typography to refer to the typefaces available in more than one state or ‘weight’.

AP1.5.a. Mono-script typeface / Bi-script typeface / Multi-script typefaces

‘Mono-script typeface’: Refer to the typefaces that are available only in one script, for example the typeface, ‘Kufi’ is available only in Arabic script.
‘Bi-script typeface’: Refer to the typefaces that are available in two sets of scripts, for example, the typeface, ‘Nazanin’ is available in Latin and Arabic scripts.
‘Multi-script typefaces’: Refer to the typefaces that are available in more than two sets of scripts, for example, the typeface, ‘Times New Roman’ is available in Latin, Arabic and other scripts.

AP1.5.b. Type family

This term refers to typefaces that are available in more than one weight. For example, Helvetica is a type family since it is available in Regular, Italics, Bold, Condensed, and etc. A ‘type family’ typeface could be a mono-script, bi-script or multi-script typeface. Alternatively, a solo-script, bi-script, or multi-script may not necessarily be a type family.

AP1.6. ‘Density’ & ‘ Grey value’ &, ‘balanced colour’,

Graphic designer and academic, Timothy Samara (2004:18), provides guidance in working with Latin script, and uses the term, ‘Grey Value’ to describe the texture or overall impression of colour is created by the balance of characters and white space in a composition. She used this term to refer to the ‘Grey value’ of a sentence’s influence on legibility of letterforms once they are juxtaposed together in a sentence. In the field of Bilingual typography, Titus Nemeth (2016), used the term ‘balanced colour’ to refer the same issue, not for individual Latin or Arabic block of text, but to express the importance of the overall texture that juxtaposition of Latin and Arabic letterforms creates on a layout.

‘Grey Value’, ‘Density’: At this research we use ‘Grey value’ or ‘Density’ to refer to the texture and balance of colour of a layout, including the texture individual scripts create, and the texture that both scripts may create overall. The reason for avoiding use of ‘balanced colour’ is because as literature review shows, the practitioners of bilingual layouts, used the term ‘balance’ to refer to other typographic matters, therefore, to avoid confusion and avoid to use of a term that may refer to different issues in different situations, we decided to use ‘Grey value’ and ‘Density’.

AP1.7. ‘Horizontal Matrices’

The typography system of each script includes some guidelines which play an important role in design and arrangement of letterforms. These guidelines, which are usually imaginary horizontal lines, define the resting point of letterforms, plus they define the highest and lowest height of the ascenders and descenders. Following the rules of these guidelines in creating new typefaces, help designers to achieve a balance and unity among the letterforms’ set. Chahine (2012:43) uses the terms ‘Ribbon’ or ‘Alignment zone’ to describe the typographic horizontal matrices that provide a consistent body size for letterforms, with definitive guidelines about baseline, ascender and descender lines, x-height and the cap-height line and body size. However, the term ‘baseline, کرسی’ and ‘typography rules’ has been used in different sources to refer to the same horizontal matrices (Mesghali, 2015; Carter, Day and Meggs, 2012; Blackwell, 1992). The term ‘guideline’ may be confused with ‘principles’, and therefore, I use the term ‘horizontal matrices’ in this research (Figure 70).
‘Horizontal Matrices’: The imaginary horizontal lines which specify the height and position of letterforms and their parts.

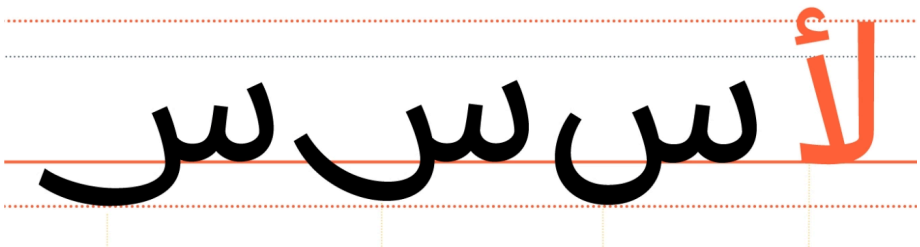


Figure 70. Typography Matrixes. Image created by Sahar Khajeh (2023).

AP1.8. ‘Pairing’ and ‘Matching’,

Pairing and Matching mean different things to different authors. Baki (2013) uses ‘pairing typefaces’ to address the action of creating a new bi-script Latin and Arabic typeface with a common style and identity. She also used ‘matching typefaces’ to address the action of choosing accurate Latin and Arabic typefaces from available mono-script or bi-script typefaces for a bilingual layout. Baki (2013) emphasises that is important in both pairing and matching typefaces to achieve ‘corresponding typefaces’ – similar style between the Latin and Arabic letterforms –.

However, Paek (2014), uses ‘pairing’ to refer to achieving harmony in juxtaposition of two typefaces with distinct scripts, which is an important approach in either creating a new bi-scripty typeface, or choosing available solo-script typefaces. AbiFarés (2010) has the same importance as ‘typographic matchmaking’. It is out of the scope of this research to propose solutions for creating ‘bi-script Latin and Arabic typefaces’ since there are variable research and articles already dedicated to this. Due to the needs of this research we use the term ‘correspondence typefaces’ similarly with the same understanding used by (Nemeth 2006, AbiFarés 2010, Kapp, 2011, Maag 2012, Baki, 2013).

AP1.9. ‘Character’, ‘Glyph’, ‘Joint’:

In this document Glyph and Character used in accordance with notions that used by AbiFarés. The Glyphs in Arabic typesetting means the extra strokes that connect letterforms together. And Characters means each set of letterforms that connected to each other (AbiFarés, 2015). However, Balius (2013:26) provided a different definition of Glyphs VS Characters, that:

> “Type designers create glyphs. A glyph is a particular graphical representation of an element of written language, which could be a character (like the letter ‘a’), part of it (like the diacritic ‘acute’ on the top of á), or sometimes several graphemes in combination (like the ligature ffi). Instead, a character is a unit of information that roughly corresponds to a

> grapheme, that is the smallest component of written language that has semantic value. In short, characters are what we type on the keyboard, glyphs are what we see."

According to Balius discussions (2013:175), 'Joint' used to refer to connecting glyphs.

AP1.9.a. Characters

To understand the context fully, an explanation about the system of Arabic script, the terminology used within this article is necessary. Arabic script consists of 28 alphabets, each alphabet based on its position in the word have 2 or 4 different shapes, including Isolated, Initial, Medial, and Final. Based on the position of each letterform, it might connect or disconnected to the previous or forward letters. According to Haralambous (1998:143), and Azmi et al., (2009:17), each individual shape of letters called 'types' and the stroke that connects each letter to another letter is called 'glyph'. While according to AbiFarés (2001:145), the different shape of letterforms is called 'characters'; according to her, 'each letter may be represented by more than one character. The Latin script has two characters (upper and lower case) to represent each letter of the alphabet. The Arabic script has four characters (initial, medial, final, and free-standing) to represent most letters of the alphabet.'

In this context, to address each different shape of Arabic letterforms, including the whole stroke and the dots, I apply the term 'character' (Figure 71).

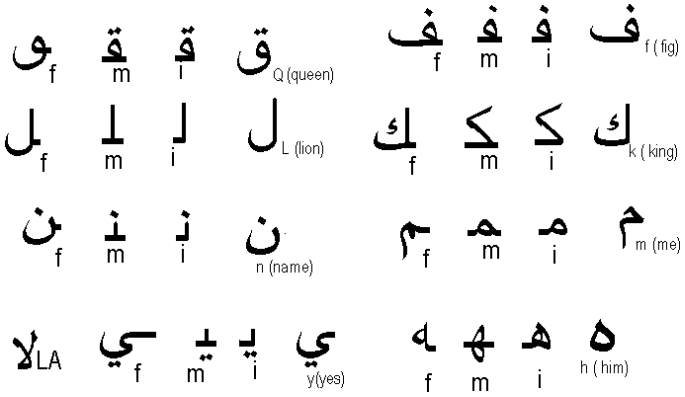


Figure 71. Few examples of Arabic Characters

AP1.10. Style

Arabic Script has different styles of writing. There are seven styles of Arabic script, including Kufic (Old Kufi-Ornamented Kufi), Thuluth, Diwani (Diwani and Diwani Djeli), Naskh, Nastalique, Ruqaa, and Maghrebi. However, AbiFarés (2001) proposed eleven different styles.

Despite some sources that refer to the seven styles as 'Script' or 'Calligraphy' (Mesghali, 2015), in this proposal, it decides to refer to them as seven 'Styles'. Since all these seven styles share a common alphabet and system of writing, while script refers to a distinct system of writing with different alphabets and elements.

AP1.11. Optical Disparities

In the system of Latin typeface design, compensation towards 'optical disparities' for letterforms is a critical issue; since it reduces eye distraction and improves the level of readability when letterforms sit together to create words and sentences.

Many designers agreed to improve readability. Each individual letterform needs minute optical corrections, specifically in the width of strokes, height, and shape of letterforms (Samara, 2004; and Noble and Bestley, 2005). For example, in the system of Latin typeface design, compensation towards the minute correction of optical disparities of letterforms effects on the height and shape of uppercase letterforms of 'E' and 'O'. As follows, the horizontal middle stroke within the uppercase letterform 'E' is shorter than the horizontal upper and bottom strokes. Also, the bottom counter within 'E' is larger than the upper counter. In another case, the height of capital letterform 'O' is higher than cap height and below than baseline. This optical correction in the height of 'O' optically presents the same height as squared form, in which the other letterforms' height is compared with that (Figure 72).

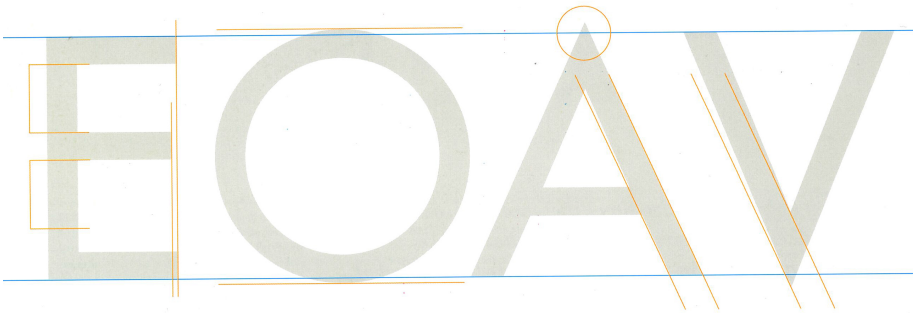


Figure 72. Minute corrections for Latin letterforms' optical disparities provided by Samara (2004)

AP1.12. Cursive

The Arabic script is cursive. As AbiFarés (2001:93), claimed, "[...] This fact causes the development of Arabic script up until now to consider the cursive feature." Ultimately, it is intrinsically cursive, because since it was recognised as Arabic script it was cursive and still is. The none-cursive style of Arabic script does not exist.

By accepting the fact that Arabic script is cursive, it includes unique features that only exist and comes to matter because of the cursive style of the script. For example, letterforms may connect to the former and previous letterforms within a word based on their position in the word. As a result, the Arabic script includes extra-thick glyphs with flexible width to join the letterforms together in a word. These two features that letterforms join, and extra flexible glyphs exist within the system of Arabic script, are neither deniable nor changeable, while playing an essential role in visual aspects of typographic composition. Also, Arabic script is a fluid script; the letterforms within a word may sit on different baselines.

The problem is the lack of minute corrections of optical disparities in the system of the Arabic typography system. This issue is more prominent and noticeable, specifically in bi-script typographic composition, where Latin and Arabic scripts sit together.

Analysis of recent popular projects focus on the juxtaposition of Latin and Arabic scripts, revealed all consistently agreed on simplification of Arabic script by reducing a horizontal matrix to achieve visual map between Arabic and Latin letterforms (Haralambous,1998; Nemeth, 2006; AbiFarés, 2010; and Gerry, 2015).

However, I believe the simplification of Arabic letterforms took the wrong approach because the designers applied Latin typographic systems to Arabic typographic system without paying attention to the issue of 'optical disparities' for Arabic letterforms.

Therefore, the outcome results in a bi-script typographic composition, including Latin and Arabic scripts. In contrast, the Latin script includes a professional level of readability, mainly because the minute corrections for optical disparities to the Latin typographic system have been applied. However, the Arabic script excludes the readability because, in simplification of Arabic scripts, designers just paid attention to the typographic matrixes without considering the issue of 'optical corrections.'

In this case, analysis older versions of Arabic typefaces like Nazanin (only available in Arabic script), revealed that the designer paid attention to 'optical correction.' Still, on the one hand, unfortunately, there is no academic source in the written version available to modern designers about this specific issue. On the other hand, simplification of Arabic script to achieve visual map between Arabic and Latin letterforms needs a new investigation to analyse the compensations towards the minute optical correction of Arabic letterforms in juxtaposition to Latin script.

AP1.13. Typographic Habits

Typographic habits used by Wittner et al., (2020), to refer typographic characteristics of a script such as reading and writing directions, its unique visual form of letterforms. I borrow this term for this research to refer to unique characteristic of a script which might be different or similar to juxtaposed script.

AP1.14. Design quality

As stated by Giangregorio (2019), in the field of project management, "the quality of each project depends on if the outcome achieved the objectives and the aim of a business case. In the field of design and typography, each brief or study case is like a business case." Therefore, quality is not about perfection or standardisation. It is about the outcome meeting the project requirements and objectives.

Appendix 2: Diagrams:

Thematic and chronological demonstration of sources used in literature review

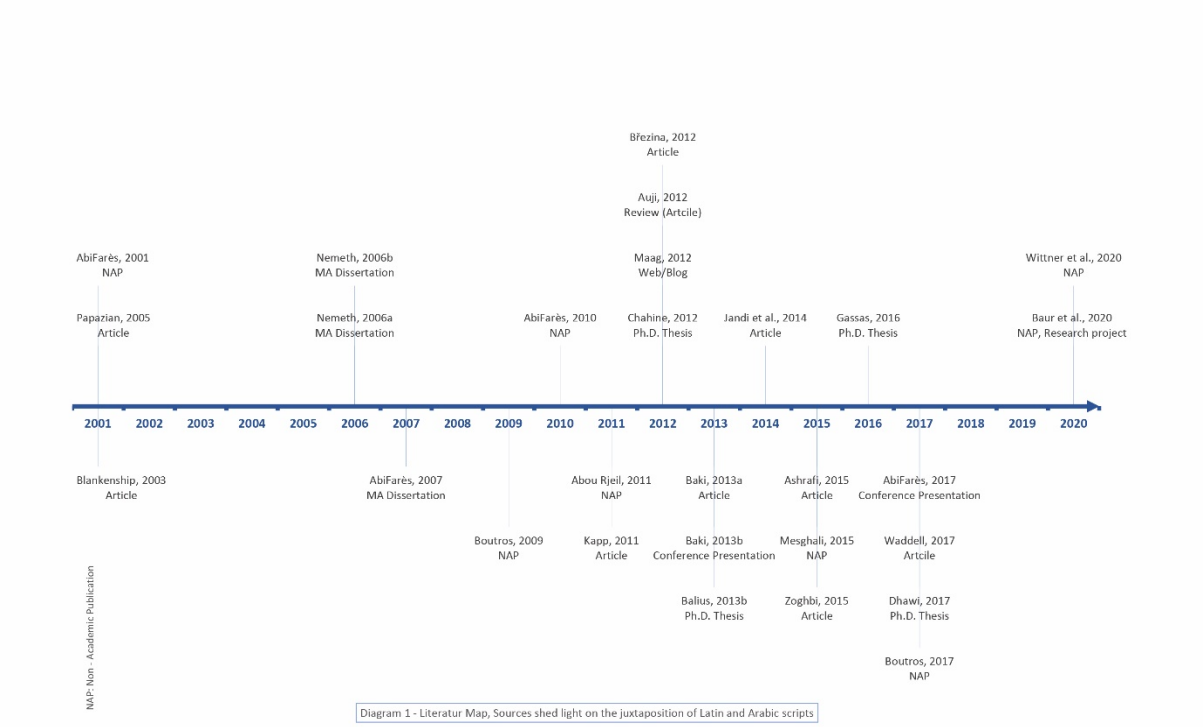


Diagram 1 - Literatur Map, Sources shed light on the juxtaposition of Latin and Arabic scripts

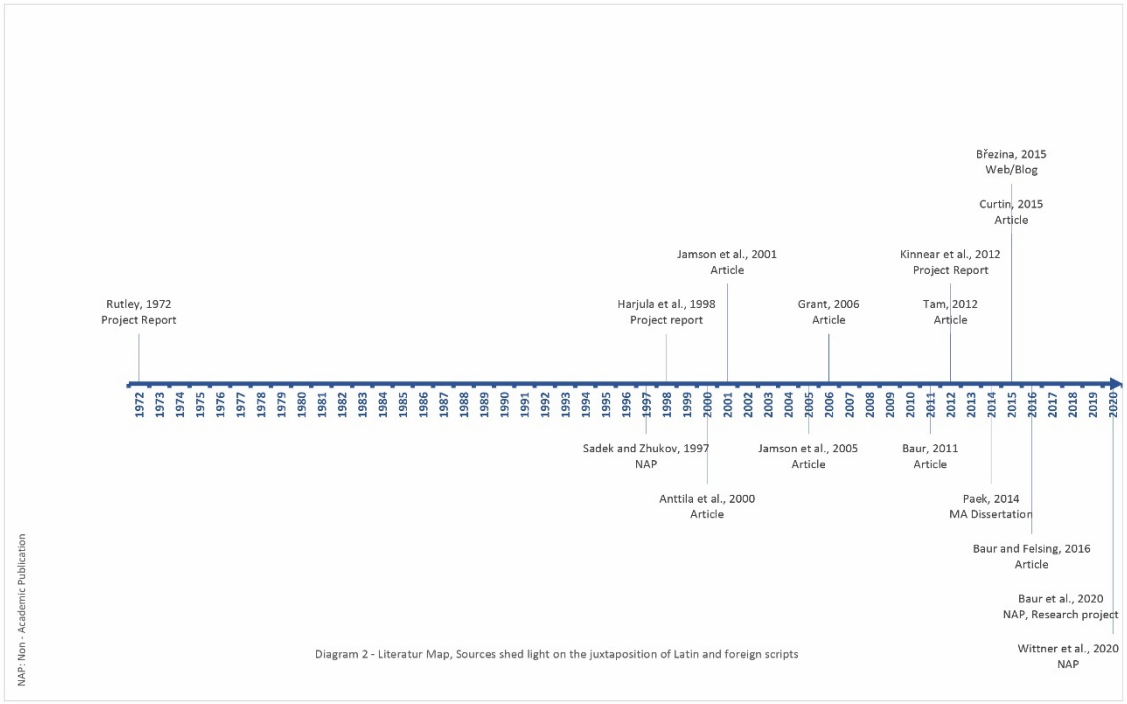


Diagram 2 - Literatur Map, Sources shed light on the juxtaposition of Latin and foreign scripts

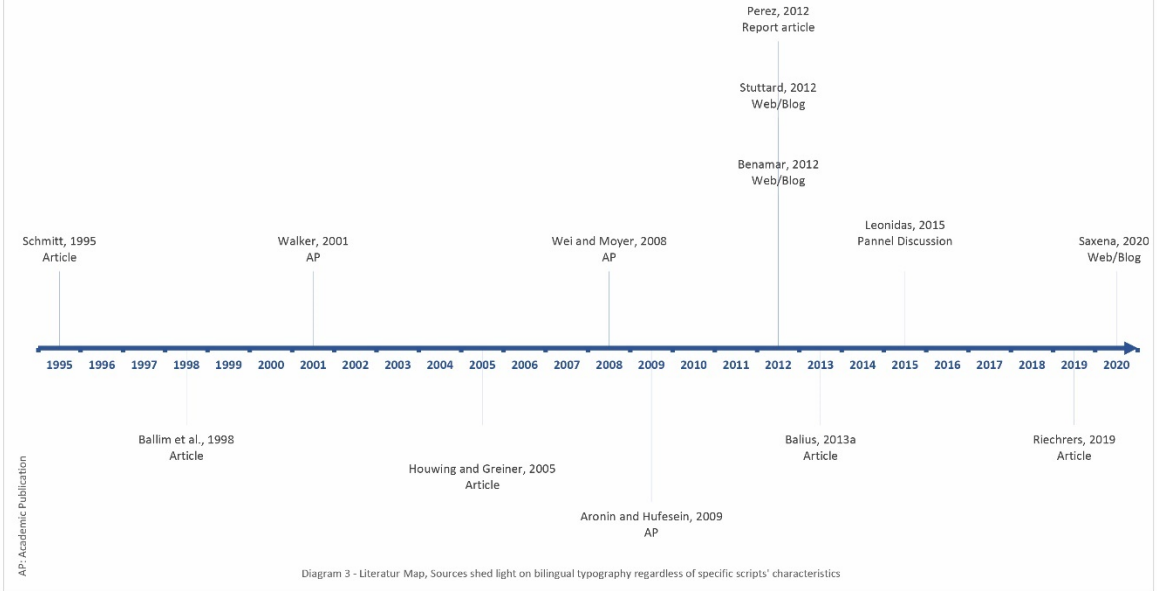


Diagram 3 - Literatur Map, Sources shed light on bilingual typography regardless of specific scripts' characteristics

Appendix 3: Primary Research: Photos from Istanbul, Turkey, 2022



Photo I. 1: Fatih - Alemdar Mh, Istanbul, Turkey, 2022. Semultaneous multi-scriptual typographic layout. Juxtaposition of Turkish, English, Kazakh, and Arabic languages or Latin, Cyrilic and Arabic scripts.





Photo I. 2: Beyoğlu – Tomtom Mh., Istanbul, Turkey, 2022. Semultaneous multi-scriptual typographic layout. Juxtaposition of Turkish, English, Kazakh, and Arabic languages or Latin, Cyrilic and Arabic scripts.



Photo I. 3: Beyoğlu – Sehit Muhtar Mh, Istanbul, Turkey, 2022.
I. 3-A: Cafe sign at the top, Simultaneous Bi-scriptual bilingual layout. Juxtaposition of English and Arabic languages or Latin and Arabic scripts.
I. 3-B: Fal sign at the bottom, Simultaneous multi-scriptual typographic layout. Juxtaposition of Turkish, Kazakh, and Arabic languages or Latin, Cyrilic and Arabic scripts.
I. 3-C: Small projection sign, bottom left corner, Simultaneous bi-scriptual bilingual layout. Juxtaposition of Kazakh and Arabic languages or Cyrilic and Arabic scripts.



Photo I. 4: Fatih – Balabanaga Mh., Istanbul, Turkey, 2022. Red Window Stickers. Simultaneous multi-scriptual multi-lingual layout. Juxtaposition of Kazakh, English and Arabic languages or Cyrilic, Latin and Arabic scripts.



Photo I. 5: Beyoğlu – Kocatepe Mh, Istanbul, Turkey, 2022. Simultaneous bi-scriptual multi-lingual layout. Juxtaposition of Turkish, Arabic and English languages or Latin and Arabic scripts.



Photo I. 6: Ayasofya Camii, Istanbul, Turkey, 2022. Simultaneous bi-scriptual multi-lingual layout. Juxtaposition of Turkish, English and Arabic languages or Latin and Arabic scripts.



Photo I. 7: Fatih – Sultan Ahmet Mh, Istanbul, Turkey, 2022. Simultaneous bi-scriptual multi-lingual layout. Juxtaposition of Turkish, English and Arabic languages or Latin and Arabic scripts.



Photo I. 8: Beyoğlu – Sehit Muhtar Mh, Istanbul, Turkey, 2022.

I. 8-A: bottom left sign above entrance, Simultaneous bi-scriptual multi-lingual layout. Juxtaposition of Turkish, English and Arabic languages or Latin and Arabic scripts.
I. 8-B: Main big sign at the top, simultaneous bi-scriptual bilingual layout. Juxtaposition of Turkish, and Arabic languages or Latin and Arabic scripts.



Photo I. 9: Beyoğlu – Gumussuyu Mh, Istanbul, Turkey, 2022. Simultaneous bi-scriptual multi-lingual layout. Juxtaposition of Arabic, English and Turkish languages, or Arabic and Latin scripts.



Photo I. 10: Fatih – Balabanaga Mh., Istanbul, Turkey, 2022. Simultaneous bi-scriptual bilingual Latin and Arabic layout. Juxtaposition of Arabic and Turkish languages or Arabic and Latin scripts.



Photo I. 11: Beyoğlu – Gumussuyu Mh, Istanbul, Turkey, 2022.
I. 11-A: Top two signs, Simultaneous bi-scriptual bilingual Latin and Arabic layout. Juxtaposition of English and Arabic languages or Latin and Arabic scripts.
I. 11-B: Bottom middle sign (Change Office), Simultaneous mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 12: Beyoğlu – Tomtom Mh., Istanbul, Turkey, 2022. Simultaneous mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 13: Veznecilar, Metro İstasyonu, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 14: Istanbul Airport, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 15: Beyoğlu – Kocatepe Mh, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 16: Beyoğlu – Kocatepe Mh, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 17: Fatih – Balabanaga Mh., Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 18: Beyoğlu – Huseyinaga Mh. Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 19: Veznecilar, Metro İstasyonu, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 20: Veznecilar, Metro İstasyonu, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 21: Fatih – Balabanaga Mh., Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 22: Beyoğlu – Gumussuyu Mh, Istanbul, Turkey, 2022. Simultaneous Mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 23: Beyoğlu – Sehit Muhtar Mh, Istanbul, Turkey, 2022.
I. 23-A: Top, Simultaneous mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.
I. 23-B: Vertical sign, bottom left, Simultaneous bi-scriptual bilingual layout. Juxtaposition of English and Arabic languages or Latin and Arabic scripts.





Photo I. 24: Fatih – Balabanaga Mh., Istanbul, Turkey, 2022. Simultaneous mono-scriptual bilingual layout. Juxtaposition of English and Turkish languages, both written in Latin script.



Photo I. 25: Veznecilar, Metro İstasyonu, Istanbul, Turkey, 2022. Simultaneous mono-scriptual multi-lingual layout. Juxtaposition of Turkish, English and Kazakh languages, all written in Latin script.



Photo I. 26: Beyoğlu – Kocatepe Mh, Istanbul, Turkey, 2022. Simultaneous mono-scriptual multi-lingual layout. Juxtaposition of Turkish, English and Kazakh languages, all written in Latin script.



Photo I. 27: Beyoğlu – Sehit Muhtar Mh, Istanbul, Turkey, 2022. Urban Bilingualism.



Photo I. 28: Fatih – Balabanaga Mh., Istanbul, Turkey, 2022. Urban Bilingualism.



Photo I. 29: Taksim Meydani, Istanbul, Turkey, 2022. Urban Bilingualism.

Appendix 4: Primary research, London, United Kingdom

Photos from North Finchley and Edgware Road, London, United Kingdom, 2017.



Photo L. 1: Shayan Restaurant. North Finchley, London, 2017. Shop sign and Projection sign. The name has a Persian root, and the Latin script is a Phonetic presentation of the Persian Name. Two different typefaces used for Arabic text. The typeface used for the Name 'Sahyan' in Persian is a simplified kufic style, with one baseline. However, the description if Persian ' asd' typefaces used is 'Nasta'lique', fluid with variable baseline. In compare, two different typefaces have been used for the Latin texts. The name 'Shayan' has been presented in a serif font all in capital, while 'restaurant' has been presented with the same typeface with initial in capital but the rest in lowercase. The description 'Persian cuisine, is presented in a san-serif typeface all in capital with a smaller size.
The whole name with description in Persian presents as 'Shayan Iranian Restaurant'. However, in Latin it presented as 'Shayan Restaurant' with extra line below presents 'Iranian Cuisine'. This shows inconsistent presents of the name and slogan in the juxtaposed scripts.
The list of foods and juices has been presented just in Arabic on the canopy. While the 'welcome' word is only presented in Latin. There is inconsistency in use of script for different messages.
The projection sign at the top used a different colour brand (Red, instead of Blue for the Latin), and advertised a different service (Shisha). The Arabic typeface is different to the typefaces used for Persian Text on the Shop sign.



Photo L. 2: Tehran Pars. North Finchley, London, 2017. Shop sign. The name has a Persian root, and the Latin script is a Phonetic presentation of the Persian Name. All the information including the name and the services presented in Latin capitals. In one side the business activity 'Supermarket' added under the name in English. However, in the other side, instead o the business activity, services in English language added under the Persian name. The name in Latin, has been presented in Serif while a san-serif font has been chosen for the services and business activity. It sems a reasonable approach since Sans-Serif typefaces are more readable in smaller sizes compared with Serifs. The choice of Arabic typeface rooted from Naskh style is appropriate decision since it provides more consistent body-size for Arabic script, which is more match with consistence to uppercase Latin Letterforms. The only information presented in Arabic script is the Name and the halal logo.



Photo L. 3: Esfahan Supermarket. North Finchley, London, 2017. Shop sign. The name has a Persian root. The Name 'Esfahan' in Latin script is a Phonetic presentation of the Persian Name. But the description 'Supermarket' is a translated. However, an exact description in the name and description in Persian is 'Esfahan Confectionary and Supermarket', but in English is presented as 'Esfahan Supermarket'. With additional description as 'Iranian & Mediterranean food' on the shop sign. Another description added on the canopy as 'Persian & Mediterranean food'. The word Iranian and Persian used exchangeable which cause confusion for foreign audiences. This lack of consistency in Persian and Latin messages affect on Persian users' trust and present an appropriate design quality approach.
There is inappropriate decision on the use of Typefaces. Persian texts presented in Bold with consistent weight of strokes. However, the Latin script in Serif with inconsistent weight of strokes.



Photo L. 4: Afghan Market. North Finchley, London, 2017. Shop sign. There inconsistency between information in Persian language compared with English language. The message in Persian presented, Afghan's Bakery at the top. Then below the big English name, it says Afghan, Iranian and Arabic in Persian language. However, the Name 'Afghan market' is only presented in Latin script. And the services including 'Asian Groceries, vegetables, Bakery and Calling Cards demonstrated just in English. The only message presented equally in both Arabic and Latin script in 'halal'. It seems, too much information and images presented in the limited space of the shop sign.
Since a Nasta'lig style used for Persian texts, the designer used a fancy script Latin typeface in lowercase to resemble cursive style of Arabic script, and fluidity of Arabic forms with fluid strokes in M, K and F. The other information in Latin presented in Uppercase. The English texts are superior due bigger font size compared with texts in Arabic script.



Photo L. 5: Afghan Market. North Finchley, London, 2017. Projection Sign. The text in Arabic presents 'Afghani Bakery'. Typographically has the same approach as the Shop sign on Photo L.4.



Photo L. 6: The Crown London. North Finchley, London, 2017. Projection Sign. The business name rooted in English. Surprisingly despite earlier cases, the name (Crown) in Arabic script, Persian Language is a phonetically presentation of the name in English. But the descriptions Estate and London have been translated. The name including the descriptions is not exact demonstration of the information in English. Since in English they add 'Estate agent and management'. But in Persian is just said 'Estate Agent'. This approach may be due to cultural difference of presentation of services and their details in different societies or for different audiences. For example, in Persia regions, Estate Agents do not mention 'management' however they provide it. But in English culture, the wording management is mentioning.
All information in English, are presented with the same san-serif typeface, per the hierarchy and important of the information they presented in different font size. The only Persian text is the business name.



Photo L. 7: Tavazo patisserie. North Finchley, London, 2017. Shop sign and Projection sign. The name has a Persian root, and the Latin script is a Phonetic presentation of the Persian Name. Two very different style of typeface and logo design used for the name in Persian compared with the Latin, which present a very different branding to Persian readers compared with English readers. Although the layout is neat and consist of appropriate proportion and position texts. The name is the only information represented in Persian.



Photo L. 8: '110' or '110 kako'. North Finchley, London, 2017. Shop sign. It includes Inappropriate inconsistent in presenting the information and typefaces. It is not clear what is the exact name. The website is presented at the middle with bigger font for '110'. However, the domain name is 110kako. If Kako is part of the name, it roots in Persian, but only presented phonetically in English! Underneath the website it presents 'Fresh Sandwiches' in Persian languages. There is different information, each presented in one script. There is no evidence of visual map between the juxtaposed English and Persian languages.



Photo L. 9: Waheed Supermarket. Surbiton, London, 2017. Shop sign. The layout presented an appropriate design approach. Not all the English information presented in Persian.



Photo L. 10: Beirut restaurant. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. A simplistic approach with professional design decisions about the typeface and style of the name in both Arabic and English languages. However due to different colours used for each language, a different branding presents to Arabic script readers compared with English readers. The domain presents a different name 'Maroush' which may cause confusion.



Photo L. 11. Alrazi Pharmacy. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. The business activity 'Pharmacy' given superiority compared with the Arabic counterpart by presenting it in much bigger size and encompassing 2/3 of the space. All the service presented in Arabic Language in tiny separated sign underneath.



Photo L. 12. Money Change. Edgeware Road, London, 2017. Projection Sign. The activity is translated in both languages. It is interesting all diacritics and sounds has been presented for the Arabic text. Since Arabic script is Abjad, and consonants do not need to present in writing system. For example, instead of 'Sarraf' it write as 'srf'.



Photo L. 13: 'Wonder Travel Centre'. Edgeware Road, London, 2017. Shop sign. The name in Arabic translated in English. The hierarchy of information, positioning Arabic at the top give the Arabic text a priority to read. But presenting the English text in nigger size and bolder typeface with consistent bold strokes' weight, put the English in superiority. If the Arabic texts were presented with a bold typeface with consistent weight of strokes, rather than the current typeface with inconsistent width of strokes, it may put both at the same foot.
Use of the red colour on blue for the services is not a smart choice.



Photo L. 14: Shazia Food Hall. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. Both Latin and Arabic presented equally at the same layer. This is due to the same body-size between English and Arabic Messages. And most importantly due to juxtaposition of the name side by side. Position of Arabic at the right and English at the Left is appropriate decision which facilitate reading conditions per each script reading and writing directions. Mix of code is also observed on this shop sign that the business activity is presented in English, but the services presented just in Arabic.
For instance, for me who is not reader of Arabic script, I cannot understand the services of the business. But if it was presented in English, I could have gain an idea from the services. Therefore, in bilingual layouts, we must consider the readers ability as a monolingual reader or bilingual.
Typographically, two different typefaces used for Arabic information for the name and the services. A better choice of typefaces for the services could benefit visual excellence of the layout.



Photo L. 15: 'Lordz Telecom'. Edgeware Road, London, 2017. Shop sign. I cannot see any link between the presented name in Arabic, phonetically presents as "Oskar Lelsiahat', with the English text 'Lordz Telecom'. They seem two different names and activities. Typographically, at the first glance, the priority given to the Arabic text by presenting the name in bug size. However, minority of Arabic text, since the "Oskar Lelsiahat' is the only Arabic text, put English readers in superiority.



Photo L. 16: Prince Pharmacy. Edgeware Road, London, 2017. Shop sign. This is the first approach that name In Arabic has been translated to English. A simplistic approach with professional design decisions about the use of equal space for both scripts. I assume the decision for the Latin typeface made to simulate cursive style of Arabic script, but it is not a proper match with the Arabic Typeface. Specially because the Arabic typeface has long 'glyphs' and high ascender line for the teeth of 'ye', and 'de', each Arabic letterform seems bigger and more legible. But the Latin typeface, remained with short body-height which reduced its readability. The visual map between the two scripts could improve by a use of more appropriate Latin Typeface.



Photo L. 17. Shazia Food Hall. Edgeware Road, London, 2017. Shop sign. This local shop have the exact name as the one presented in Photo L. 14. This presents how different space influence on design decisions. On Photo L. 14, higher hight of the shop sign allows juxtaposition of Latin and Arabic texts the top side by side, presenting the activity and services underneath. As it explained in captions of Photo L. 14, we observed how that design approach put both Arabic languages and English language readers at the same foot. However, in this picture, Photo L.17, the ling text In English including the name and the activities, compared with the shorter Arabic text present just the name, give superiority to English readers. To adjust the space, designer stretch the glyph of Arabic letter 'Sh'. But this approach makes more space between Arabic letterforms, with considering the fact the Arabic letterforms has variable body size, presents them bigger and more legible from distance. But since Latin letterforms all presented in uppercase, with small and consistent gap between the letterforms, especially because the letterforms that created the words "Shazia' in English have small counters, the Latin script looks smaller. For example, letterform 'O' due to bigger counter, and since is repeated twice in the word 'food', it makes the word 'FOOD' more legible from distance compared with the 'Shazia' and 'HALL'. If the bars of letterforms 'L' in Hall' was not cut out, it may present HALL more legible.



Photo L. 18: Beirut Cafe Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. This Lebnian food shop has the same name and spelling as the shop sign in Photo L. 10. The Latin typeface used has some qualities since it has inconsistent width o strokes similar to the Arabic ones. However, using uppercase letters with consistent body-size is not helping the visual map with the fluid Arabic typeface. Mix of codes- using different scripts for different information is evident. Although the activity mentioned as 'CAFÉ" in English, but in Arabic it presents as 'Lebanina Restaurant'.



Photo L. 19: Al-Mustafa Express, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. Interestingly the activity 's name 'Express' has root in English, and it is presented phonetically in Arabic. Considering the available huge space, a better decision about the design could be made. The name has been repeated for times including both English and Arabic versions. The same with the word 'Express'. Again, use of all uppercase letterforms could not help visual map between the Arabic and English, results in ununited branding for both Arabic and English language readers.



Photo L. 20: Al-Mustafa Express, Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. There consistent approach in present of the information in both scripts. It I sone of those exceptional cases that the description accurately and in detail translated to Arabic. Therefore, both English and Arabic information delivering the exact same information. Typographically, the typeface used for Arabic information, are Kufic, with presents tradition and old history. But the typeface in Latin is very creative and modern. It does not present the tradition and old history feeling that we get from the visual form of the Arabic letterform.



Photo L. 21: Amazon, Edgeware Road, London, 2017. Shop sign. The name has an English root, and the Arabic script is a Phonetic presentation of the English Name. The name presented in Arabic seems like a bi-scriptual Latin and Arabic Logo approach. However, the activity 'Supermarket' is presented in Latin rather than the name. Considering eh fact that the translated version of 'Supermarket' is presented above the Arabic name, seems like an unprofessional approach for a Logo. The use of different style of typefaces and colours for the name in English compared with Arabic implies different branding. Presenting the Name in English in bigger size, outline with a contrast colour, make it superior to Arabic. Presenting services in Arabic under the English name, and vice versa, Is not helping reading conditions. Due to oppose reading direction in English compared with Arabic script, mix of the to scripts on each side cause too much eye movement.



Photo L. 22: 'The Privilege Salon', London, 2017. Shop sign. This is another approach that name In Arabic has been translated to English. The sign just includes the Arabic and Latin name excluding descriptions and services. But inappropriate proportion of text in English compared with the Arabic, presenting the Latin in very small font size, in a very different typeface style and colour compared with Arabic, makes the English text looks like a description rather than the name of the business. Although the name was not selected wisely, it may be due to decision maker's lack of familiarity with English language culture. The working on the English version is like objectives.



Photo L. 23: Bureau De Cahnge. Edgeware Road, London, 2017. Projection Sign and Shop sign. The activity is translated in both languages. However, surprisingly the same activity 'AlJazirat-ol-Siahat' is repeated twice on the top and bottom of the board. In different typefaces and colours. The visual presence of the layout implies that there may be two different business with the same activity.

Typographically, the typeface used for Arabic word 'Saraf' has some quality considering the fat 'shoulders of the letterforms 'Sad' and bold steam of letterform 'fe'. It is similar to shape and thickness of bars in Latin Version letterform 'e' an 'c'. However due to nature of translation, all three words in French language, translates into one world in Arabic. This gives more space for Arabic line, help to present the word in Arabic in bigger size compared with Latin counterpart. Therefore, due to bigger font size of Arabic text for 'saraf' compared with 'Bureau De Change' the visual map is influenced and not presented perfectly.



Photo L. 24: Bureau De Change. Edgeware Road, London, 2017. Projection Sign and Shop sign. The activity is translated in both languages. Different typefaces used for each script on the shop sign compared with the same information in the same script on the projection sign. In addition, use of different colour for the Arabic text and for the background, it shows the designer did not consider the importance of consistency in design approaches and the lack of paying attention of demonstrating the same identify for the business by every approach. However, the shop sign has a multi-scriptual approach. Only Arabic is presenting in red, which means use of a different colour help designers to emphasis on the Arabic and make it superior in juxtaposed to other four languages.
The business name Cambio, just presented in English language, and only the activity presented in other languages.



Photo L. 25: Shazia Food Hall. Edgeware Road, London, 2017. Projection sign, for the local shop presented in photo L. 17. Although on the shop sign the name presented in both Latin and Arabic. But on the Projection sign, just the Arabic version is used, in companion with other information such as telephone number and opening time in English. In this example, a different weight of a typeface used to emphasis on important information. For example, '24' at he top corner presented in bold to attract readers attention. The position of the text '24 hours at the top right corner of the layout is a proper decision, since pe Geshtalt theory in User Experience Design, especially Latin language readers see the top corner prior to the other corners.



Photo L. 26: Slemani. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. At the first glance it seems to be a spelling mistake on the English. Since per frequency of Arabic language and from linguistics view, it seems weird to pronounce sounds 'S' and 'L' without any consonant. Per my experience it should either 'Solemani' or 'Seli/emani'. It may be due to unfamiliarity of the designer or decision maker about Arabic language.
Presenting Latin and Arabic names on two separate signs, may implies there are two different shops, rather than one branded shop. But the presence of the Latin name 'Slemani' vertically on the right side of the Arabic part' implies all are part of one business. The descriptions on the window and the canopy all presented in Arabic.
The vertical approach for the Latin version is interesting, since the same approach for Arabic script is impossible. For more information about different vertical approach for Arabic script refer to Chapter 1: Primary Research in Istanbul, Turkey.



Photo L. 27: 'Baghdad Gate Minimarket', London, 2017. Shop sign. This is another approach that name In Arabic has been translated to English. The sign includes the Arabic and Latin version of both the name, descriptions and services. But unsuccessful approach as observed in Photo L. 22, due to inappropriate proportion of text in English compared with the Arabic, presenting the Latin in very small font size, in a very different typeface style compared with Arabic, makes the English text looks like a description rather than the name of the business.
Arabic typefaces is Kufic style which deliver a very traditional and old concept.



Photo L. 28: 'Safeer Pharmacy. Edgeware Road, London, 2017. Projection sign. A Naskh style of Arabic typeface, where all letterforms sist on one baseline used, which makes it closer to Latin. The Pharmacy in Latin without presenting the name presented in Bol all in uppercase, which emphasis on the activity on the business. It seems the aim was to attract audiences and customers due to services they provide and advertising about their business activity as a Pharmacy, rather than marketing about their name. Informing foreigner customers about the name of the business was a secondary.



Photo L. 29: 'Wonder Travel Centre'. Edgeware Road, London, 2017. Projection sign, for the business presented in photo L. 13. The services are just presented in Arabic while the name is presented in both Arabic and English. I am not sure it the was supposed to be a bi-scriptual Logo design or not. If yes, the superiority given to English readers by resenting the name in English in bigger size and very bold typeface; specially with the fact that the name in Latin is shorter concerning the smaller number of letterforms compared with Arabic, but still more space given to the English Name.



Photo L. 30: 'Marble Arch Food'. Edgeware Road, London, 2017. Shop sign. The name 'Marble Arch' has an English root, and the Arabic script is a Phonetic presentation of the English Name. Choose of in contract typeface style for juxtaposed scripts, the English in bold weight and uppercase, compare to the tiny width of strokes in Arabic typeface, alongside positioning Latin at the top, gives superiority to Latin Script readers. Due to this approach, the juxtaposed scripts do not present united identity. It seems the design did not pay attention to the hierarchy and arrangement foo her information on the layout. The telephone number, opening hours and shop number are presented at the bottom without any divided sign. In contrasts to other shop signs that present the shop number at the top corner, this layout presents it at the top bottom right, which is the last position for Latin script readers, that eye see per eye movement on the layout.



Photo L. 31: 'Marble Arch Food'. Edgeware Road, London, 2017. Shop sign. The Latin version is translated version of the Arabic text. This is an exceptional sign that includes a separated log o apart from presenting the name in both English and Arabic. However, despite bi-scriptual approach for the name, the Logo which is typographic, is monolingual in English Language. A very different typeface styles, san-serif, used in Logo compared with the name in Latin script in Serif. Neither of the Latin typefaces, not the typeface in Logo, not the one used for 'King Pharmacy' at the left side of the sing, mapped with the typeface style used for the Arabic text. Two different typefaces also used for the Arabic text.



Photo L. 32: Aldar restaurant. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. The descriptions with accurate translation presented in both Script. The only concern is about the lack of visual map between the Arabic Typeface and the Latin for the name, since each presents different brand. Also different typefaces used in each script for the description compared with the typeface used for the name.



Photo L. 33: Palm Palace. Edgeware Road, London, 2017. Shop sign. This is another approach that name In Arabic has been translated to English, but the descriptions presented just in English. The difference style of typefaces used for English compare to the Arabic, deliver different branding.



Photo L. 34: Al Arz, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. A simplistic approach with professional design decisions about the typeface and style of the name in both Arabic and English languages. In both cases there bold consistent width in strokes.



Photo L. 35: Mahal restaurant. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. The descriptions with accurate translation presented in both Script. A simplistic approach with professional design decisions about the typeface and style of the name in both Arabic and English languages. It is an exceptional case that the Latin texts presented all in lowercase which perfectly woks to provide visual excellence. Considering the word 'mahal' with five letterforms' it was supposed to present in uppercase, it would present a bold and heavy name. But by present it all in lowercase, it perfectly makes a balance with the Arabic counterpart.



Photo L. 36: Lebanon restaurant. Edgeware Road, London, 2017. Shop sign. The name makes sense in both Arabic and English language, delivering the same connotation. The descriptions with accurate translation presented in both Script. A simplistic approach with professional design decisions about the typeface and style of the name in both Arabic and English languages.



Photo L. 37: Al Razi Pharmacy. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, and the Latin script is a Phonetic presentation of the Arabic Name. The approach to present Arabic version of each text in English underneath the English world is perfectly work. Interestingly, due to oppose reading direction of Arabic to English, this approach ease reading conditions. The superiority given to the English texts by positioning them at the top and make the Pharmacy in English bigger than the counterpart in Arabic. This approach implies, presenting eh business activity was in priority compare to reading and presenting the name.



Photo L. 38: Abu Zaad. Edgeware Road, London, 2017. Shop sign. The name has an Arabic root, but it only presented phonetically in Latin script. Due to the fancy and manipulated typeface used, it makes it difficult to foreign languages readers to anticipate the name. I assume, mostly Arabic script readers who may be familiar with this Arabic culture in using 'Abu' in the names, could identify the name and read it. Otherwise legibility of letterforms is a wonder. The Arabic name presented with standard typeface on the canopy is helping to identify the name.
The readability of the English description 'Damascene Cuisine' is diminished by the choose of inappropriate typeface.

Appendix 5: Primary Research, Juxtaposition of Latin and Arabic in History

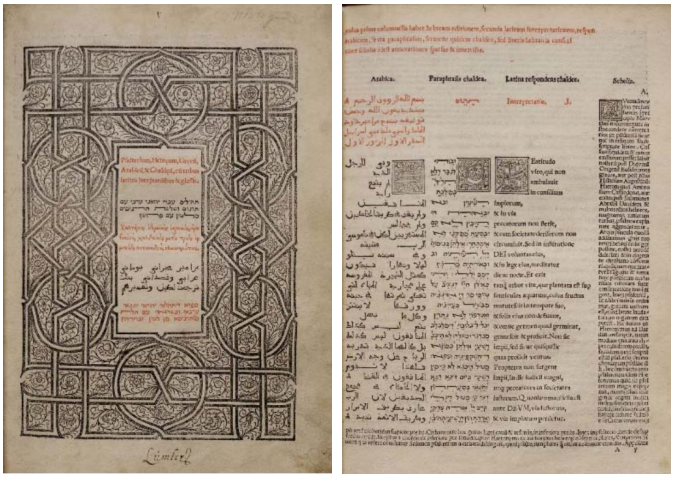
Samples of simultaneous juxtaposition of Latin and Arabic scripts in history.



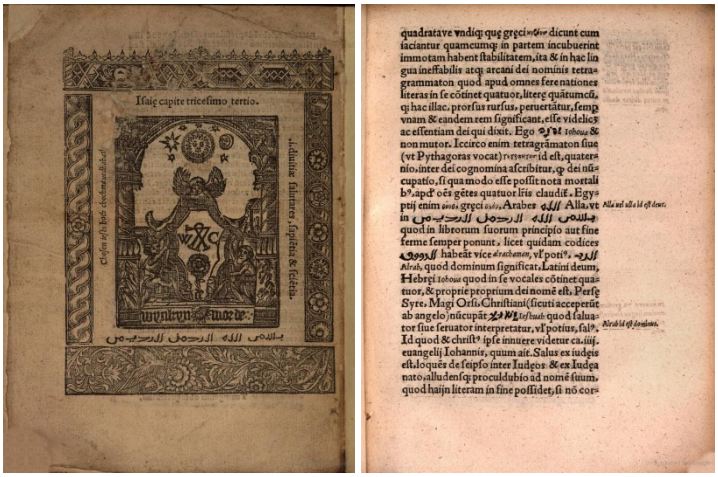
HJLA 1. Arte para ligeramente saber la lengua arauiga (Arabic Grammar), 1455, Spain. The first printed Arabic Alphabet. Simultaneous Juxtaposition of Latin and Arabic scripts. The woodcut Maghrebi Arabic letters have larger body size and counters compared with Latin texts. This results in wider white space around Arabic letters and make them superior to Latin. The Arabic text's size in closer to the Latin's title instead of the Latin texts in body size. The lines in Arabic, adopted to the double-sided alignment perfectly, without visual impairments since the Arabic presents in detached letterforms. Lack of consistent baseline for Arabic texts, and inconsistency of strokes' width for similar letterforms in different pages are apparent which must be due to difficulty of cutting fluid Arabic letterforms on wood. Both scripts' fonts, have variable stroke width in a letterform.



HJLA 2. Kitab Salat al-Swa'I (book of hours), 1514, Italy. The first Arabic book printed with moveable metal type. Simultaneous Juxtaposition of Latin and Arabic scripts. A handwritten style of Latin font used in juxtaposed to Arabic title in vocalised font. Both scripts' fonts use linear, thin and consistent width of strokes. The style of the Arabic texts specially in the main body applies that the curvish and fluid style of Arabic letterforms could not properly adopt to the printing technique, so the characteristics of the Arabic texts remain between geometric and fluid. Its like a beginner handwriting who are not yet fluent in drawing the beautiful fluent Arabic texts. The Latin footnote follows the same Latin font on the cover. Despite the childish primary looks like of the Arabic texts, a good decision about Latin text was made to adopt and resemble with cursive feature of Arabic script.
Some Arabic ligatures had to squeeze, some detached letterforms repositioned, and kerning adjusted to adopt the whole text to the double-sided alignment.

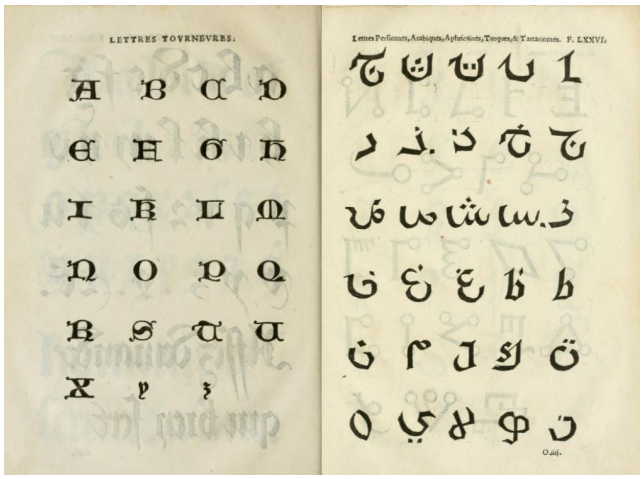


HJLA 3. Psalterium, Hebreum, Grecum, Arabicum, et Chaldeum, cum tribus latinis interpretationibus & glossis, 1516, Genoa. The first Polygot Bible. Simultaneous Juxtaposition of Latin and Arabic scripts. Double sided alignment of Arabic texts causes uneven rivers intervene readability and visual quality of the design. Although in some cases the Arabic texts' glyphs extended but it could not prevent the huge rivers. Probably its due to the short width of the column which cause including 2-3 words in a line. Interestingly the bigger width of column dedicated to the Latin text with different alignment approach. The inconsistency of column widths for the juxtaposed three columns in three different languages and different alignment approach for Arabic compared with Latin, maybe due to typesetting techniques for different languages, or the typesetter less familiarity with Arabic compared with other languages. The Arabic texts seems a bit bigger and blacker compared with juxtaposed scripts.

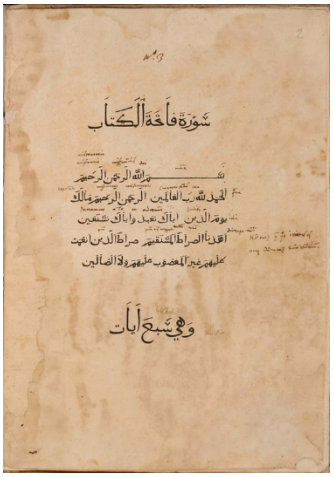


HJLA 4. Oratio de laudibus & vtilitate triu[m] lingua[rum] Arabicę Chaldaicæ & Hebraicę, 1524/1528, London. An unusual approach for Arabic script. The letterforms remain detached. Besides, the strokes of final position letterform of 'mim' ' م ', rather than drawing straight towards descender line, have been curved, with a rounded stroke touch the baseline. The final position ' م ', presents as middle position 'م', with a final position ' ن ', without dot. Except for Arabic script readers who are familiar with this popular verse of Quran, it interferes with legibility of the letterform for beginners. Besides, the middle position letterform 'ح', seems more like a ' د', due to unprofessional simplistic presence of the shape. It seems it was difficult to print complex shapes such as ' ', The Arabic font's style seems primary compared with the juxtaposed Latin due to miss position of letterforms in a line, inconsistent approach in shape and size of similar letterforms, and the gap in body size of Arabic compared with Latin.

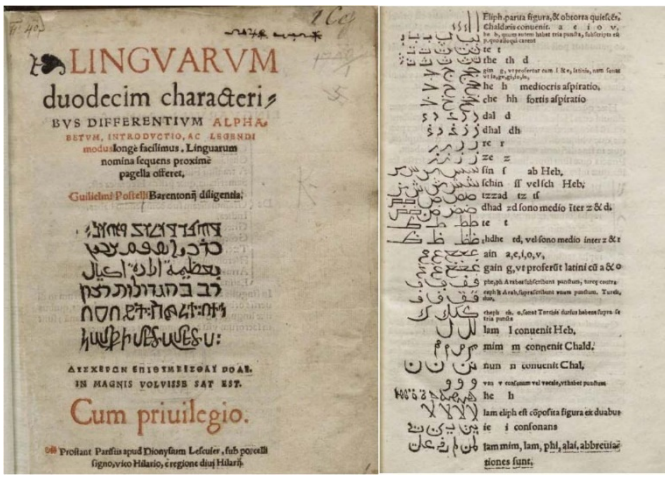
AbiFarés (2001), claimed this is the first book with Arabic quotations, but after analysing the book, it remained unclear what she meant by 'first Arabic quotation'.



HJLA 5. Le Champ Fleury, 1529, Paris. In 184 pages in French, with 1 page (P 171) including woodcut Arabic alphabets with translation of the letterforms in Latin in the facing page. The bigger size of Arabic letterforms, and different style of Arabic fonts compared with Latin makes it difficult for these two scripts to marry. Compared with the image 'HJLA 4', this approach shows the designer attempt to maintain fluidity of Arabic script and a try to make it less geometric. But lack of knowledge about anatomy of Arabic letterforms is obvious, since the anatomy of similar letterforms that present different soucd by adding dots, remain different, on the other hand ignoring some important of strokes for some letterforms sucha s 'ghe', make it more similar to 'te do noghte'. The wide counters in some letterforms such as 'he 2 chashm' ' he ahar' and 'sin teeth', may result in unbalanced visual compensation when these letterforms sits together to create a word or a sentence.



HJLA 6. The first Koran by Alessandro Paganini, 1537-1738, Venice. There is small, annotated texts in Latin which is unclear if it is a handwritten or a printed text as Translation. This Holy Koran shows reserved Arabic attitudes in printing with movable type.



HJLA 7. Linguarum duodecim characteribis differentium alphabetum, 1538, Paris. Arabic texts curved on wood. The text presented in multi scripts, at middle on the image at Left, shows design intention of achieving visual similarity between the scripts written elements. E.g., all follows consistent width of strokes, with almost similar body size. However, the san serif approach with consistent width of strokes, does not common feature with the widespread serif Latin type on the page. It seems the middle multi-script texts, created and curved together, juxtaposed to properly an existing Latin font.
The juxtaposition of Arabic and Latin on the image at the right, did not consider visual excellence between the Arabic and Latin, due to a quite considerable difference in the Latin size compared with Arabic.



HJLA 8: Grammatica Arabica by Guillaume Postel, 1539, Paris. Arabic fonts are woodcut, after Guillaume could not manage to purchase printing types from Alessandro Pannini. Again, different body size of Arabic texts compared with Latin is the first thing catch the eyes. Due to the technique used 'woodcut' Arabic texts seems more geometric and do not present its fluidity. The bigger leading 'line gaps' between lines including Arabic text compared with those without Arabic is also obvious. Additionally, bigger word spacing between Latin and Arabic when they juxtaposed observe compared with the word spacing in lines that only include Arabic or just Latin. In those pages that a paragraph presented in Arabic as the translation of the Latin text, the different amount of information in Arabic per the nature of translation is apparent.



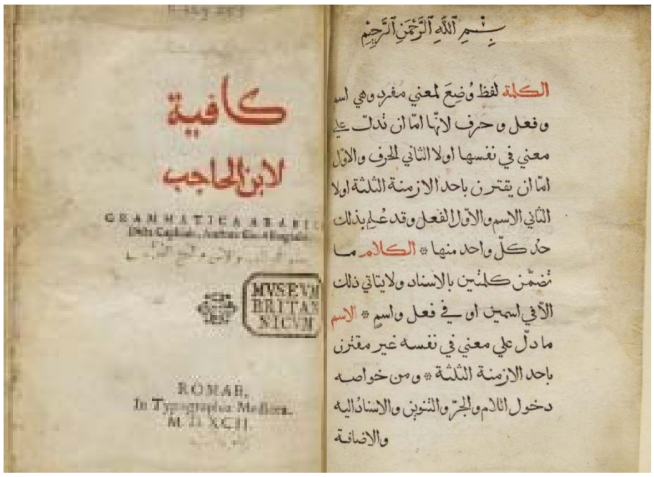
HJLA 9: Iʿtiqād alamānah alurtūduksīyah kanīsah rūmīyah [sic]—Fidei orthodoxae brevis et explicita confessio quam Sacrosanta Romana Ecclesia docet, 1566, Rome. To keep visual balance, both scripts, have been aligned in centre, using red and black. The colour used in pattern for every other line in Red instead of using colour code for texts of similar notation. A wider leading applied to Latin to match with Arabic leading needs. The English texts still seems much smaller and secondary compared with Arabic. The Arabic font seems more primary compared with Latin.



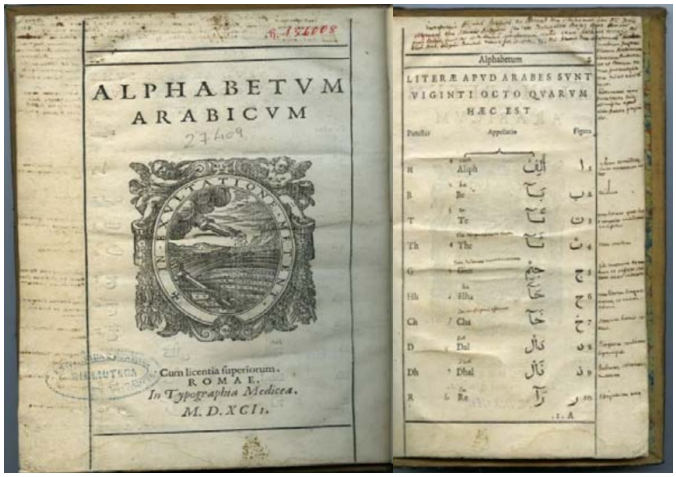
HJLA 10: The Brevis Professio by Francesco Zanetti, 1580, Rome. Using the famous 'Tipografia del Collegio Romanpo's Arabic moveable type. Compared with previous samples, this Arabic type reserved a better fluid and cursive characteristics of Arabic script. Still in compared with the Latin type, the Arabic seems much bigger and less official. The Latin included much less leading compared with Arabic.



HJLA 11: Stamperia Medicea, 1590-1591, Rome. This book is one out of nine religious boos that Typographia Medicea published. A good decision on use of different Arabic type 'Arabica Grande' for titles compared with the type 'Arabica Piccolina' used for body text. The type used for would be less legible in smaller size due to being very cursive feature, being vocalised with tight tracking, very low descenders and reverse strokes for 'ye'.
The religious context of the book adjusts the reason for the very small use of Latin texts as translation of he Arabic. The Arabic fonts used on this book, use in many other publications after this. The typesetting done by a member of graduation classes from Maronite College in Rome. A very consistent of leading all over the pages.



HJLA 12: Kafiyah li-Ibn al-Hajib, 1592, Rome. The book of Arabic grammar. This is the only copy identified. Apart from juxtaposition of Arabic and Latin on title page, it is unknown if bilingual approach exists in other pages. The Arabic type here presented a better culture of Arabic script due to its fluidity and adaptation of Arabic fluid shapes with its delicate curvature anatomy to the printing. The Arabic type in terms of style, size and colour does not match with Latin on the title page. But it may be an acceptable approach for a title page, since the presented information in Latin include the name of the publisher, the city and an explanatory description of the book, which is avoidable to present in Arabic.



HJLA 13: Alphabetum arabicum, 1592, Rome. For such a context as teaching Arabic Alphabet, it is wise approach to present Arabic letterforms in much bigger size.

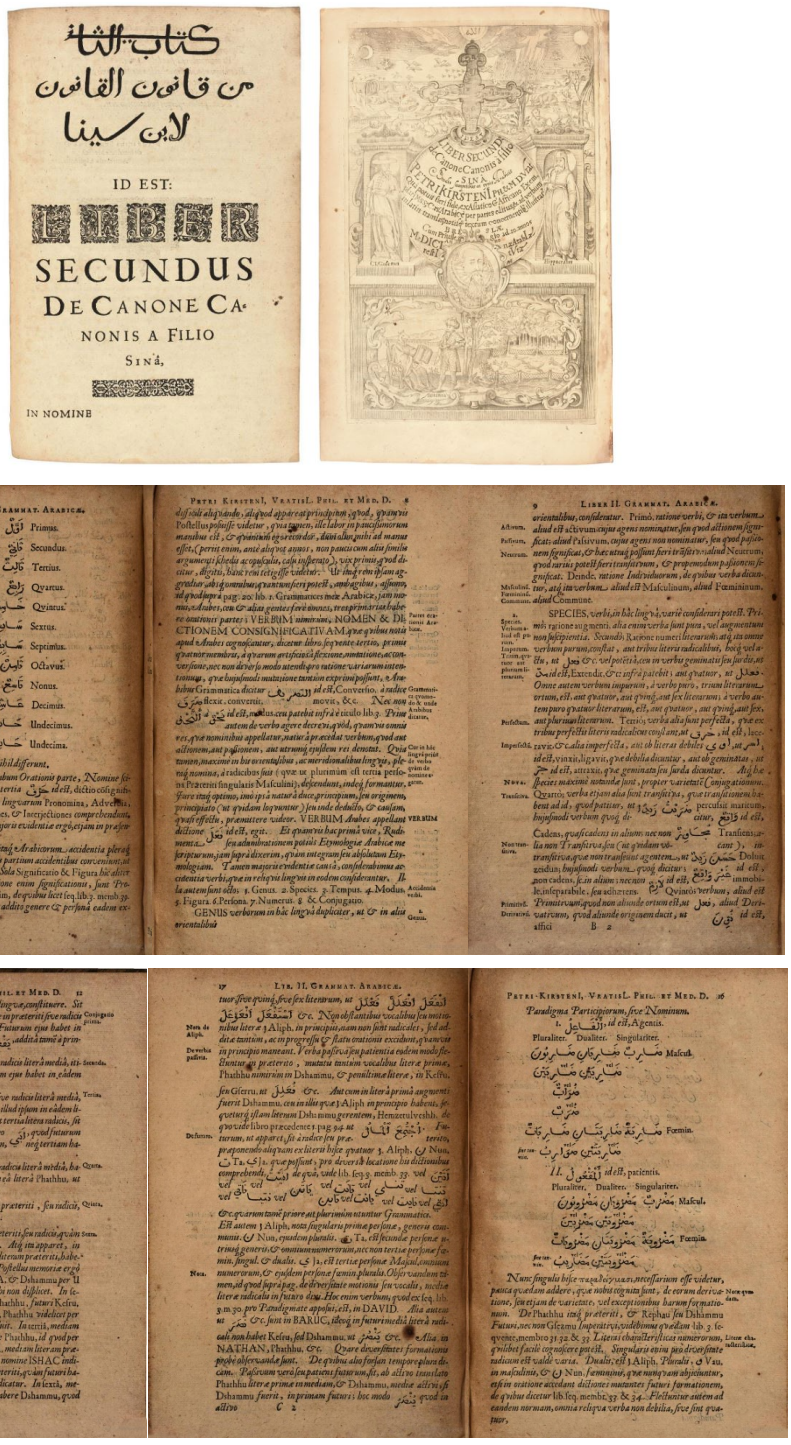


HJLA 14: Avicenna's Canon of Medicine, 1593, Rome. This book is in Arabic script except a very little presence of Latin on the title page. The Arabic type used fo r'Ibn Sina' positioned centred in middle, is a better match with the seriousness and official look of the Latin type. It is due to a better joint connection of letterforms. Since the type used for the top title, include a very rounded angle of connection points, makes it unstable on the baseline. A more angular connection points in the type used for 'Ibn Sina' make the text stable on consistent base line makes it more serious. Compared with the previous books, it managed a readable Arabic type in small size with consistent leading.



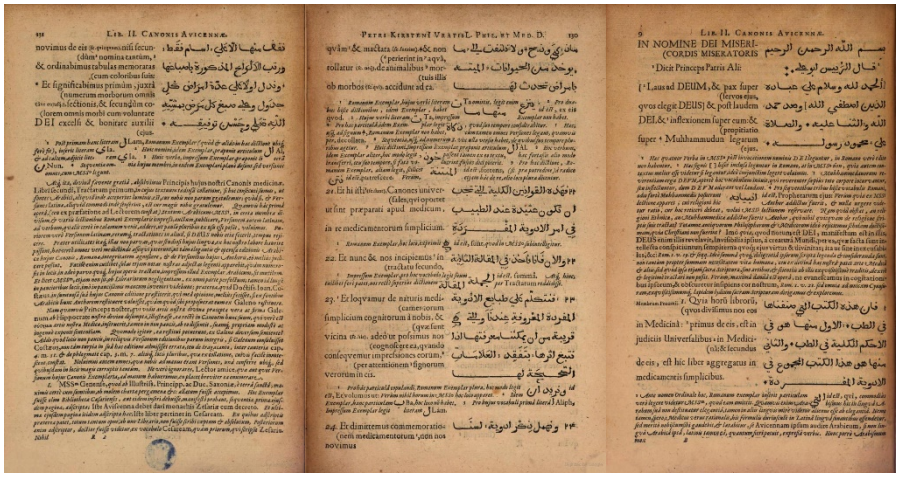
HJLA 15: Specimen Characterum, 1595, Leiden, Holland. The Arabic type created by Franciscus Raphelengius as the result of scarcely of Arabic types in Holland. He runs the printing press for the Leiden University and the font was created as imitation of Arabic types designed by Granjon. His type design approaches attracted Arabic language tutors, which on its own as receiving confirm from someone familiar with the language, is proof its design appropriately responded to the cultural needs and readability concerns. Again, the large scale of the Arabic texts compared with juxtaposed Latin is justified by the nature of the context, but double-sided alignment of the Arabic texts, results in unnecessary word spacing and unpleasant rivers.

Although Arabic text is primary, but page numbers presented in Latin and despite a very wide bottom margin they squeezed to the tight top margin.

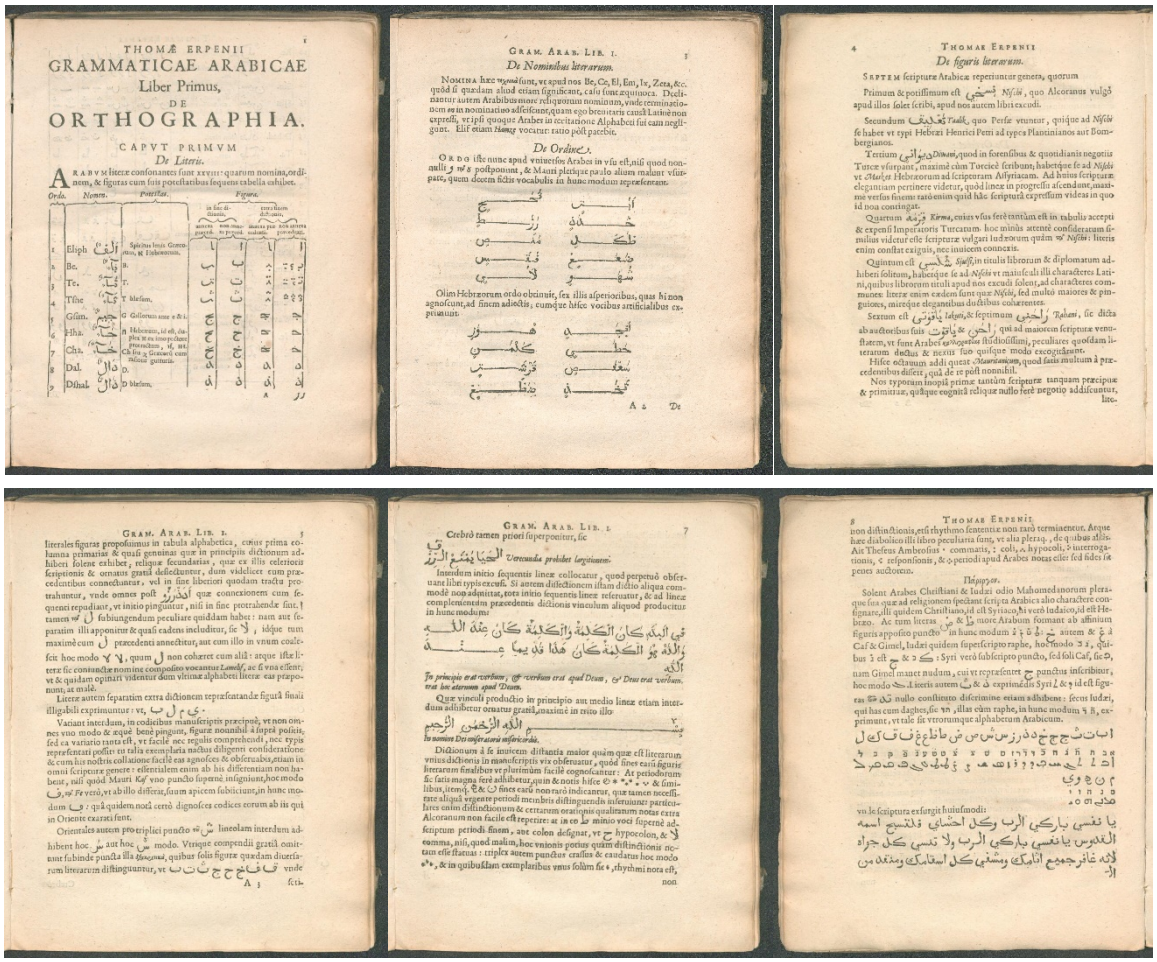


HJLA 16: Gramatices Arabicae, 1608, Germany. The Arabic font created by Peter Kirsten influenced by Granjon fonts. There is a misposition of Arabic texts siting above or below a line – more obvious on the second image from end – this cause inconsistent spacing. The Arabic texts managed to have a better match with the size of Latin texts compared with previous samples.

Different leading applied for sections that Arabic and Latin sits in separate lines face to face compared with the body-text that includes both mono-scriptual and bi-scriptuals Increased leading for facing lines per Full vocalised Arabic script needs, allowed consistent leading. It is understandable smaller leading applied for body text since not all of them include Arabic. However, it caused inconsistent leading for body text since the Arabic needs larger leading compared with Latin.



HJLA 17: At-tani min Qanun al-Qanun id est: Liber secundus de Canone Canonis studio, 1609, Germany. Learning Arabic language got a strong interest in universities and many professors started to create their own Arabic font with their own expenses, such as Peter Kirsten who created this type. In this case, these typefaces named after the professor who create it rather than getting a typographic name. This publication has a better approach in double alignment of Arabic by using long glyphs to avoid unpleasant rivers. Still inconsistent leading effected by presence of Arabic script is the main issue.



HJLA 18: Grammatica Arabica, 1613, Netherlands. Use of stretched glyphs to achieve equal length for Arabic letterforms on the second image on the first row. Use of stretched glyphs in other pages also helped management of rivers, having less eye disturbing spaces. It perfectly helped balance and design of the page. A better decision about leading for paragraphs with switch code approach.



HJLA 19: The Doctrine Christiana, 1613, Italy. Unbalanced page layout for the juxtaposed scripts. From these two spear pages samples, it seems Latin scripts positions in middle vertically, while for unknown reason Arabic positions on the top of the axis. The different spaces on bottom and top of each script compared with other, cause eye circulation on the page and lack of focus for reading.



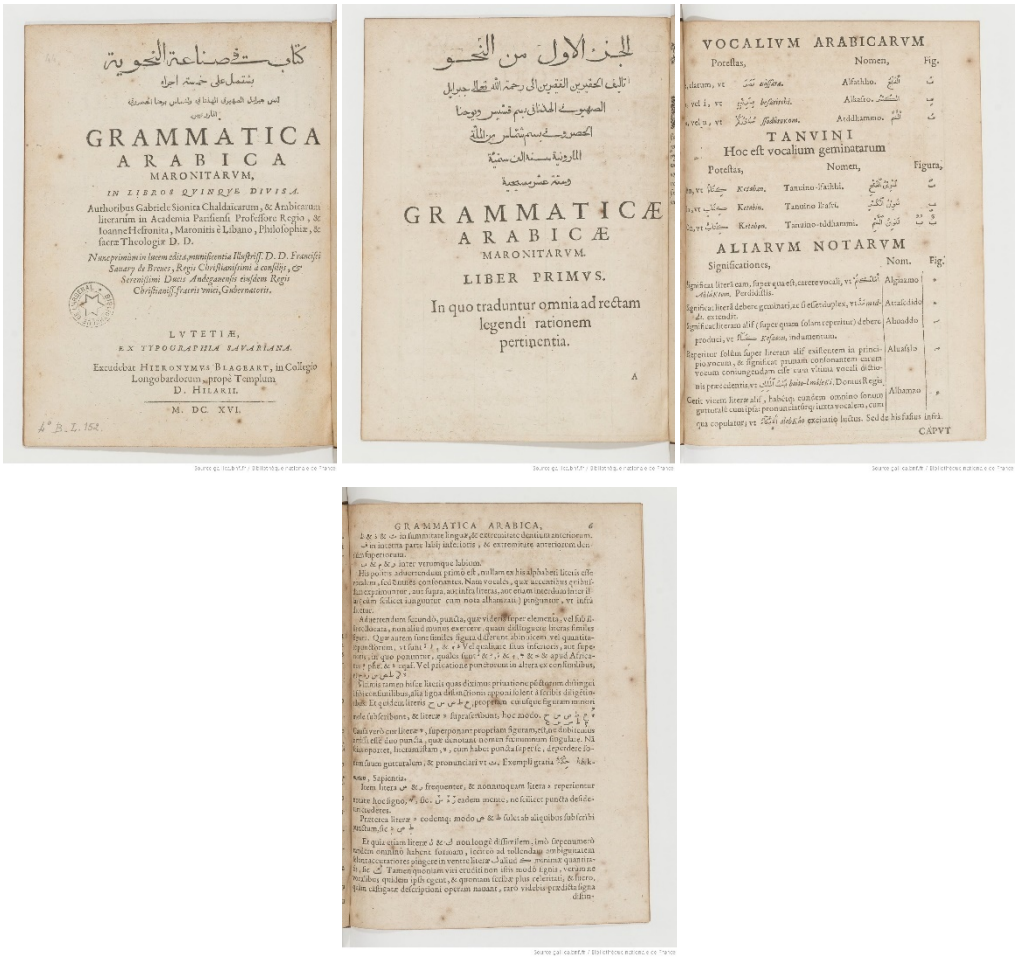
HJLA 20: Translator, 1614, Rome. An interesting manual adjustment of Arabic letterforms in the middle image, which helped extra kerning for Arabic letterforms with wide counter. For instance, the 'Ze', and 're' in Mazameer, both should have the exact same anatomy, but the 'ze's descender rotated towards the baseline, prevented unpleased kerning in juxtaposition to 'Alef'. In normal case, having 'alef' after re or ze' will cause unpleasant kerning. However, this approach cause illegibility of letterform, and makes it readable by understanding the word. In addition, the 've' has considerable shorter descender compared with 're' and which again helped in reducing unpleasant spaces between letterforms. This approach makes the Arabic words more united.

Although the Arabic text on its own seems ok, and well designed, but in juxtaposition to the Latin on the last image, a much bigger size of Arabic title compared with the Latin title, and bogger leadings due to use of vocalised Arabic type compared with Latin did not help harmony of the page.

Image at the right on the second row, shows the tiles page only presented in English without providing Arabic equivalent. But the Arabic translation only provided for the main body-text.



HJLA 21. Kitan Al-Amthal, 1614, Netherlands. Erpenius used vocalised Arabic font of Raphelengius for this publication, but he cut his own fonts and established his own press afterwards. The Arabic text is not established on one baseline. The same ligatures such as 'Lellah' has different anatomy and body size in different positions specially in the last line. This is a good example of having hyphenation in Latin, but the hyphenations do not exist in Arabic. It is obvious that no attention paid to the bilingual design. The Arabic texts are double sided aligned with right alignment of the last line. However, the Latin has centred alignment for last line of a paragraph.



كتاب صناعة النحوية

GRAMMATICA
ARABICA
MARONITARVM,
IN LIBROS QVINQVE DIVISA.
Authoribus Gabriele Sionita Chaldaicarum, & Arabicarum literarum in Academia Parisiensi Professore Regio, & Ioanne Hesronita, Maronitis e Libano, Philosophiæ, & sacræ Theologiæ D. D.
Nunc primùm in lucem edita, munificentia Illustriss. D. D. Francisci Sanary de Breues, Regis Christianissimi à consiliis, & Serenissimi Ducis Andegauensis eiusdem Regis Christianiss. fratris unici, Gubernatoris.
LVTETIÆ,
EX TYPOGRAPHIA SAVARIANA.
Excudebat HIERONYMVS BLAGEART, in Collegio Longobardorum propè Templum D. HILARII.
M. DC. XVI.

الجزء الاول من النحو

GRAMMATICÆ
ARABICÆ
MARONITARVM.
LIBER PRIMVS.
In quo traduntur omnia ad rectam legendi rationem pertinentia.

VOCALIVM ARABICARVM
Potestas, Nomen, Fig.
TANVINI
Hoc est vocalium geminatarum
Potestas, Nomen, Figura,
ALIARVM NOTARVM
Significationes, Nom. Fig.
CAPVT

GRAMMATICA ARABICA, 6

HJLA 22. Grammatica Arabica Maronitarum, in libros quinque divisa, 1616. Paris. Use of long glyphs on title page. An unusual approach for the ‘t’ at the end of ‘ketabat’, it presented in end position ‘te’ right after end position ‘be’ instead of using ‘te do hashm’. It may be due to inadequate knowledge in Arabic letterforms. The layout of both scripts’ paragraphs matched presented a centred. A bigger size of Arabic fonts used for equivalent Latin titles that presented all in capital. The first two images show, the possibility of tracking in Latin. Since the letterforms are detached, by adding equal space between letterforms the words’ length could increase without visual disparities. Which is difficult for Arabic since letterforms link and width of a literature in each word is different. Besides due t wide counter of end positioned letterform, therefore adding tracking results in unequal spaces between each word. At this sample, there is more gap between the word ‘Men’ with the previous work compared with the following word.

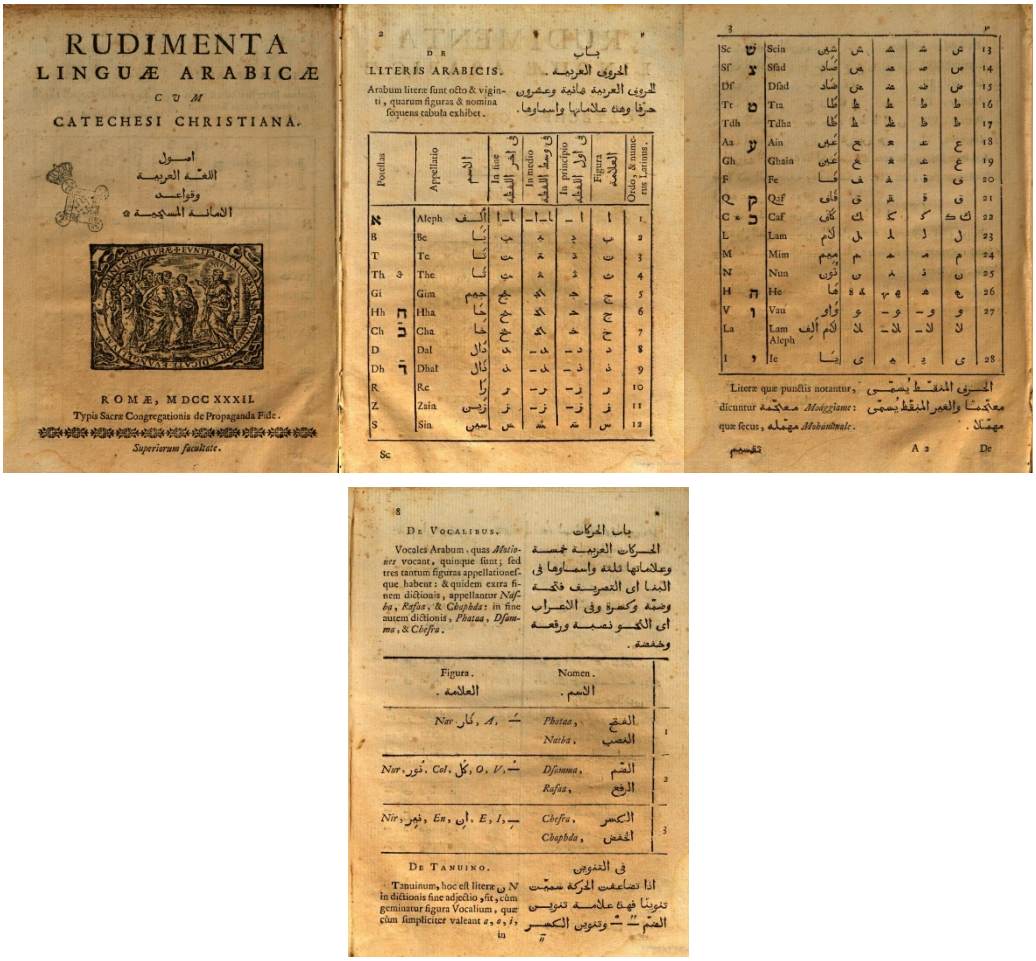
A good decision about the Arabic size in the main body, however the different leading in sentences including Arabic compared with those excluded Arabic is observed.



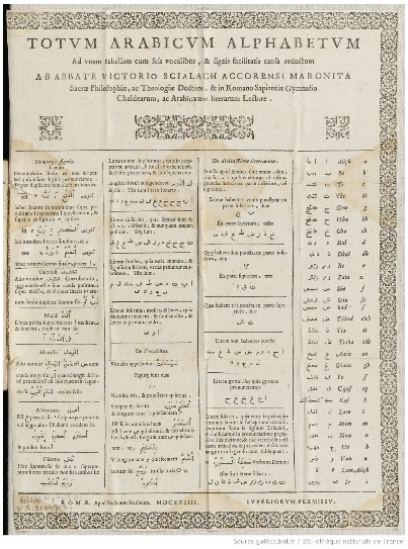
HJLA 23. The New Testament, 1616, Dutch Republic. For the first time an attempt in matching Latin and Arabic scripts is observed. A different Latin type used for the text 'Arabice', used a cursive Latin font to probably resemble Arabic script fluidity and cursive feature.



HJLA 24. Historia Josephi Patriarchae ex Alcorano, 1617, Dutch republic. This book and the previous one (HJLA 23) both published by the same press; therefore, it is not surprise that both have the same approach on the title page for use of a different Latin front for 'Arabice' to resemble Arabic script characteristics. Different font size used for Latin scripts in different pages. In the second page the Latin fonts are smaller, compared with the third image. The difference is that in the second image Arabic texts presented in separate lines, therefore there is no Arabic text mixed with Latin in the Paragraphs, however the third page include Arabic text mix with Latin in a sentence. This may be influenced the decision to use bigger font size for the later, to match the with the Arabic size and have a better control of leading. Surprisingly the last images include very smaller Latin text compared with Arabic mixed in one line. The decision about the different Latin size may also influenced by the content or function of the text in each section. Finally, the Arabic texts seems bolder and blacker, due to use of small counters, with Nasta'lique approach in small font size.



HJLA 25. Rudimenta Linguae Arabicae, 1620, Netherlands. A real development in use of appropriate Arabic font inside diagrams. Arabic and Latin positioned vertically as titles in the diagrams, but each in different direction, Arabic from top to bottom, but Latin from bottom to top. A better use of stretched glyphs for Arabic in double aligned paragraphs with less visual disparities which usually cause by river. No attention paid to importance of consistency in different pages. In the title page the Arabic looks secondary due to smaller body size, but in body text, it seems primary due to bigger body size.



TOTVM ARABICVM ALPHABETVM

Ad vnam tabellam cum suis vocalibus, & signis facilitatis causa reductum

AB ABBATE VICTORIO SCIALACH ACCORENSI MARONITA

Sacræ Philosophiæ, ac Theologiæ Doctore, & in Romano Sapientiæ Gymnasio Chaldæarum, ac Arabicarum literarum Lectore.

HJLA 26. Totum arabicum alphabetum, ad unam tabellam cum suis vocalibus et signis, facilitatis causa, reductum, ab abbate Victorio Scialach, PDF:1622, Online sourse: 1624, Rome. The expertise of Arabic text scholar is apparent. The page contains an appropriate layout with equal columns. Smaller use of full vocalised Arabic fonts fit with appropriate level of readability. However, bigger body size of the Arabic font, probably influenced by the full vocalisations, compare to Latin make Arabic primary and make it difficult to achieve consistent leading. Latin paragraphs aligned left adopt to reading direction of the Latin script, however, Arabic's cauterised. Perhaps left alignment may not be appropriate approach for Arabic texts due to different reading direction of the text compared with Latin. But centred approach juxtaposed to left aligned Latin texts does not help the design. Different alignment approach for juxtaposed scripts affects equality of the two scripts and on the function of the texts. E.g, for monolingual readers, who are capable of reading only Arabic the question arises if the centred Arabic text is equivalent translation of the Latin text, or this different approach tend to visually highlight necessary information.



Oratio Simeonis Sacerdotis.

Nunc ô Domine mi dimitte seruum tuum cum pace secundum eloquium tuum, quoniam oculi mei iam viderunt salutem tuam, quam præparasti ante faciem omnium populorũ, Lumen reuelatum est gentibus, & gloriam populo tuo Israel.

FINIS.

Primus Modus.

Secundus modus.

HJLA 27. Introductio and grammaticam arabicam, auctore abbate Victorio Scialach, 1622, Rome. A good use of long glyphs for the double aligned Araphic paragpah in the first image at left, helped to avoid unpleasant rivers. However, the very long glyph at the almost last double aligned line, interrupt readability, due to very long glyph it turns to a line and eye needs to search for the next letterform. It is against intuitive readability.

Besides, since Latin and Arabic has opposite read direction, starting left aligned sentences with Latin, but ending the sentence by Arabic, without applying appropriate marks such as '.', makes it unclear about where the sentence is finished. Visually it is not intuitive to identify the end of sentence (Third image from right). In some cases, the sentence cut in middle, keep Latin in a separate short line, and then continued with Arabic text in a separate line, continue in Latin in next line (Second image). The unequal body size of Arabic compared with Latin texts, which cause bigger leading is also apparent.





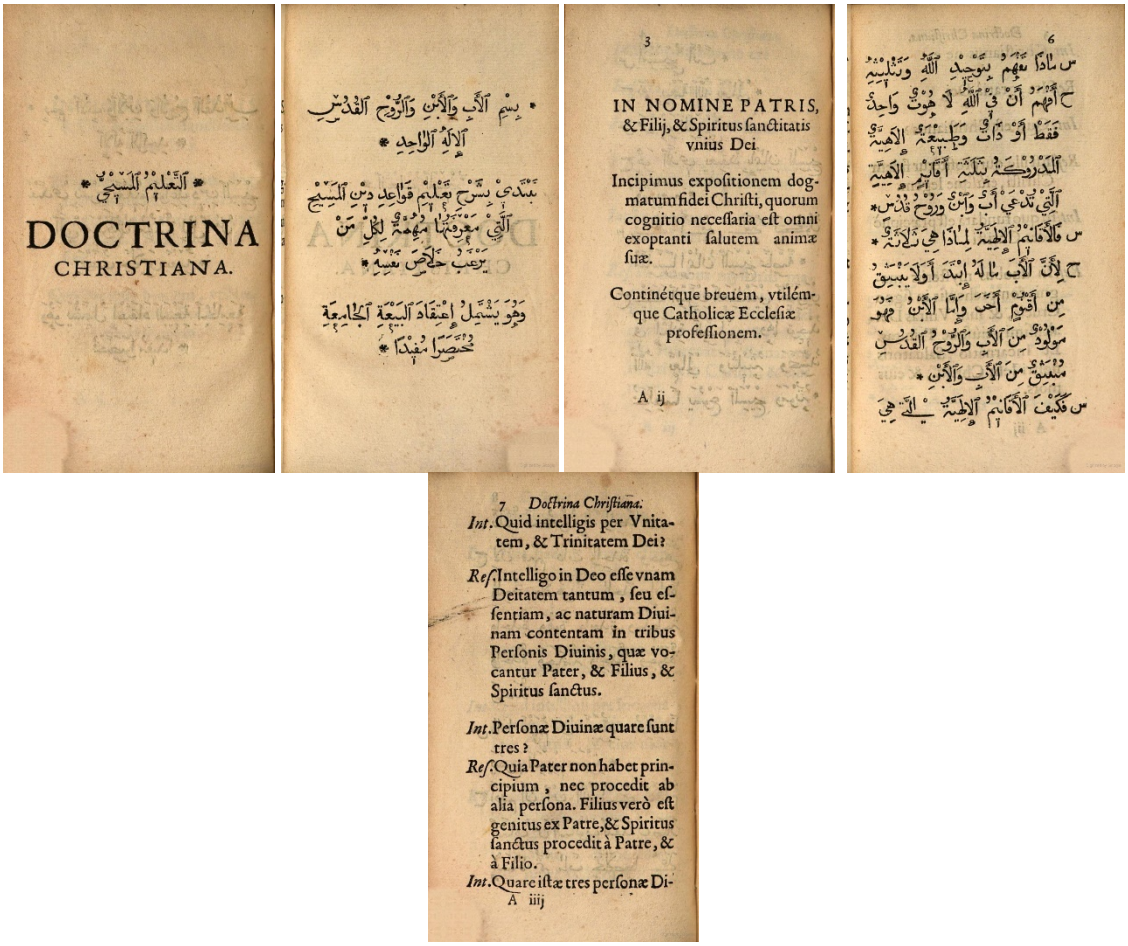


HJLA 28. Bible. Polygot (Known as Polygot bible of Paris), 1628 to 1645, Paris. A wise decision about position Arabic column at the very left end, juxtaposed to the Latin text at the Right; since it helped start reading point of both scripts starts from the same point. The beginning sentence of Arabic read from right to left, juxtaposed to the beginning sentence of Latin read from left to right. It seems a proper approach for juxtaposing Latin and Arabic in different columns side by side.

A zoom out version of the bottom section, presented in bottom image, shows mix of Capital letters, lowercase, Italic in titles, and using large capital for initial of sentence in body text for Latin section, visually helped intuitive distinction between main title, subtitle and start of body text. Although all written with the same typeface. But since Arabic script excludes variation body-size for one set of typefaces, which provide by lowercase and uppercase of the same size font in Latin, also since different paragraph characters such as using initial in Capital, or initial in bigger capital does not apply to Arabic script, and finally since the used Arabic font exclude variable weight such as Italic; it make it difficult to visually distinguish the main Arabic title from subtitle and from the main body. The visual appearance of the script does not demonstrate the level and role of the text.

In addition, although both scripts at the bottom are double aligned, and both used equal space between verses by using Latin numbers in between; in Latin this achieved a balanced approach and the spaces before and after numbers are not distracting eye. But this contrary the spaces seem unpleasant in Arabic text, since the body-size of the Latin numbers with the same size to the Latin texts, is much shorter compared with the Arabic body-size. Therefore, the proportion of used Latin numbers, present unbalanced approach, and unequal spaces. Instead, a bigger ornamental element used at the end of verses, which seems too big since it is almost equal to the teeth hight of Arabic letters. Use of Arabic numbers may have been a better approach.

Comparing body text of Latin text compared with Arabic, shows Arabic body size is still bigger. But this time the bigger size of text didn't make Arabic primary, instead the visual variety of text approach in titles compared with Body text makes Latin primary and keep the Arabic with common approach for the titles and body text secondary although it seems bigger.



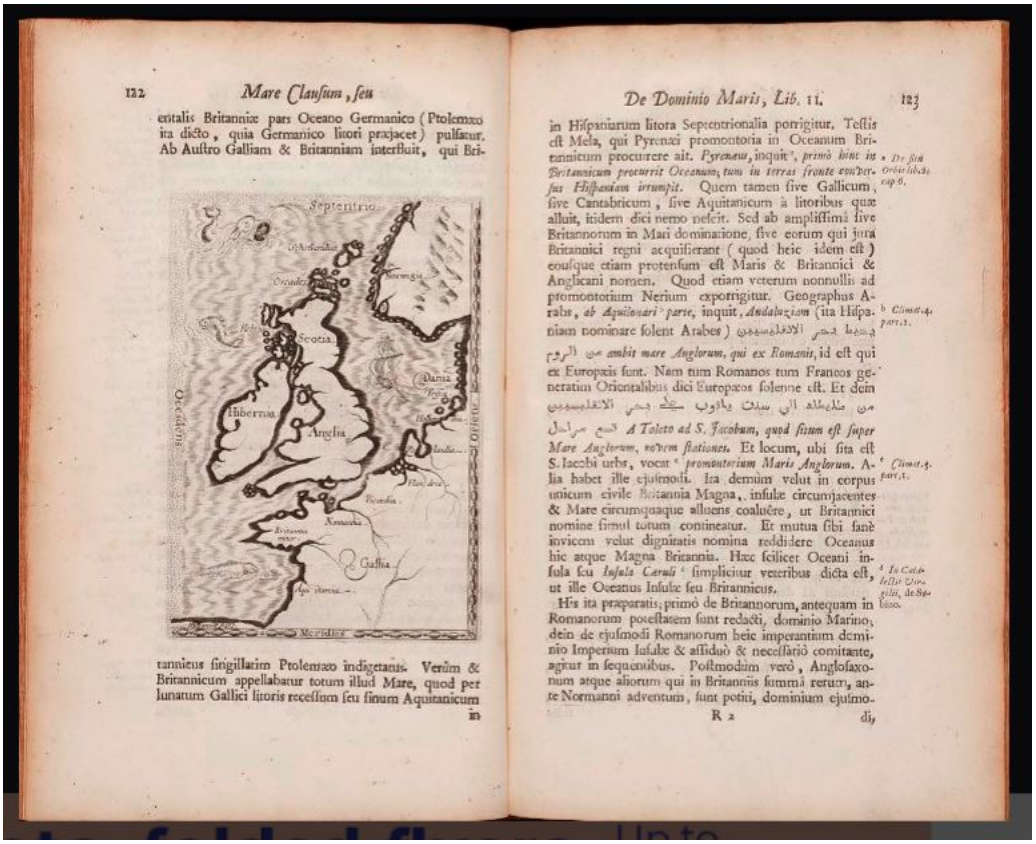
HJLA 29. ‘Doctrina Christiana’, 1635, France. Different alignment of information in first section compared with middle and bottom section in the Latin page (Third image) and mix of Uppercase and lowercase visually demonstrate the role of each section, as title, description and etc., but consistent centred approach for all Arabic texts (second image) is not visually help the role of each section.

Additionally, comparing the fourth and fifth images with indention, in Latin the use of italic and dot, perfectly visually distinguish the ‘ref’ and ‘int’ from the main text. But in Arabic although it attempts to resemble the same indention by use of ‘س’ and ‘ح’, but due to similar weight and lack of dot ‘.’ The two letters visually mixed with the main body text. In addition, the indention in Latin text seems more visible, since the letters at the beginning of each line perfectly sit at the same line and due to similar x-height of all Latin letterforms the consistent height of each line demonstrate a clear line at the beginning of the paragraphs. But this indention is not very visible in Arabic text. Since the Arabic with much variable ascenders, descenders and use of many dots, and vocalisations, majority of letterforms, excludes x-height. Therefore, an Arabic line could not present a defined height. For instance, in Latin, the body height of letterform ‘I’ from ‘Int’ is similar to the uppercase letterform of each paragraph. Beside the ‘Int’ sits on the same baseline as every other lowercase and uppercase letters. But the two letters used in Arabic as indention, sits on a different baseline, and there are different ascender hight for different letters in a line.

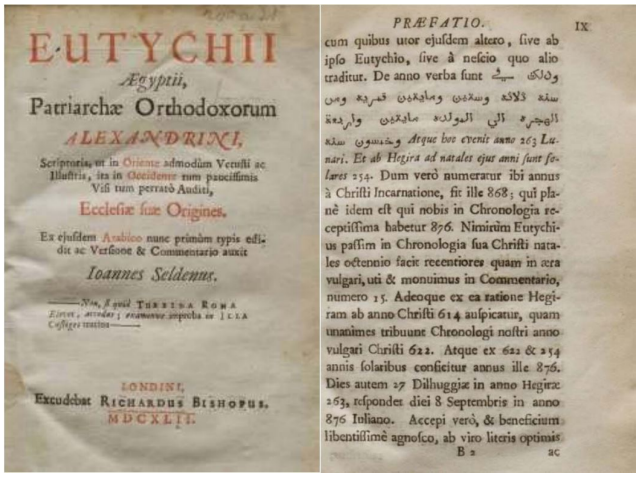
Finally, in Latin ‘Ref’ and ‘Int’ are abbreviations, but it is doubt if letterforms ‘س’ and ‘ح’ be equivalent terminology for those.



HJLA 30. Kitab Aja ib al-maqdur fi aghbar Timur, 1636, in Netherlands. Use of different colour for titles help visual distinguish of title, specifically since Arabic lacks equivalent Latin's uppercase. The Uppercase Latin title 'TIMURI' has tracking. Tracking refers to apply extra equal space between all letterforms in a word. But this approach is impossible for Arabic, since only few letters depend on their position on the word may be potential to extended glyphs. Therefore, applying Tracking, results in stretching glyphs for some letterforms, but may detached other letterforms from former or before letters that the must remain connected.



HJLA 31. Mara Clausum, 1635, England. The Arabic texts seems thinner than Latin. The inconsistent stroke weight is more prominent compared with previous publications presented earlier. These differences in the Arabic text appearances perhaps resulted in using new technology 'Metal Type'. Although the Arabic presented lighter, thinner and a bit smaller, still inconsistent leading due to Arabic's bigger body-size is apparent.



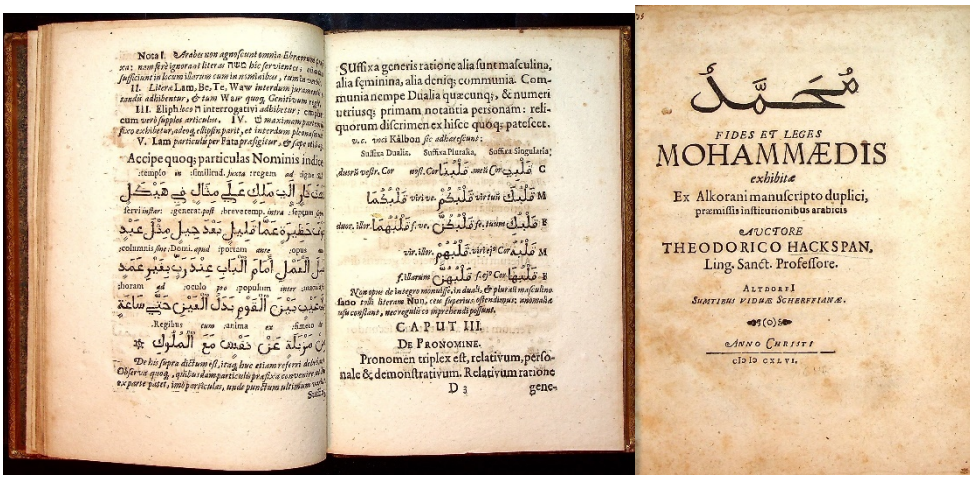
EUTYCHII
Ægyptii,
Patriarchæ Orthodoxorum
ALEXANDRINI,
Scriptoris, et in Oriente admodùm Vetuſti ac Illuſtris, ita in Occidente cum pauciſſimis Viſi tum perraro Auditi,
Eccleſiæ ſuæ Origines.
Ex ejuſdem Arabico nunc primùm typis editit ac Verſione & Commentario auxit
Ioannes Seldenus.
LONDINI,
Excudebat RICHARDUS BISHOPUS.
MDCXLII.

PRÆFATIO. IX

cum quibus utor ejuſdem altero, ſive ab ipſo Eutychio, ſive à neſcio quo alio traditur. De anno verba ſunt وذلك سنة ثلاث وستين ومايتين قمريه ومن الهجره الي المولده مايتين واربعة وخمسون سنه *Atque hoc evenit anno 263 Lunari. Et ab Hegira ad natales ejus anni ſunt ſolares 254.* Dum verò numeratur ibi annus à Chriſti Incarnatione, fit ille 868; quî planè idem eſt qui nobis in Chronologia receptiſſima habetur 876. Nimirùm Eutychius paſſim in Chronologia ſua Chriſti natales octennio facit recentiores quàm in æra vulgari, uti & monuimus in Commentario, numero 15. Adeoque ex ea ratione Hegiram ab anno Chriſti 614 auſpicatur, quam unanimes tribuunt Chronologi noſtri anno vulgari Chriſti 622. Atque ex 622 & 254 annis ſolaribus conficitur annus ille 876. Dies autem 27 Dilhuggiæ in anno Hegiræ 263, reſpondet diei 8 Septembris in anno 876 Iuliano. Accepi verò, & beneficium libentiſſimè agnoſco, ab viro literis optimis

B 2 ac

HJLA 32. Eutychius, 1642, England. Double aligned approach caused more considerable unarranged rivers for Arabic compared with the Latin. Change of reading direction in a line that consist of both Arabic and Latin is considerable. For instance, in the sixth line from top, ‘وخمسون سنة’ read from right left guide eyes towards the binding, then it must return to the middle of the page to read the Latin text from ‘Atque’, from left to right guide eyes towards the edge of the page. This change of reading direction in middle of a line effect on reading experience and reader engagement.



Nota I. *Arabes non agnoſcunt nomina literarum* ... *non ſerè ſignorant literas* ... *hîc ſervientes* ... *ſufficiant in locum literarum cave in mutandis* ...
II. Literæ Lam, Be, Te, Waw *interdum juxtaponendæ* ... *addibentur, & tam* Waw *quam* ... *Genitivum regit.*
III. Elif *hoc* ... *interrogativi addibetur* ...
IV. ... *maximum partem* ... *ſæpe excluditur, adeoq; elliſim patit, et interdum plenè* ...
V. Lam *particula per Fata præfigitur, & ſæpe aliis.*
Accipe quoq; particulas Nominis indic. ... *templo* ... *ſimilitud. juxta regem ad* ...
... *ſervi ingen.* ... *generat. poſt* ... *brevet emp. intra* ... *ſequm* ...
... *ſcalmus ſive Domi. apud portam ante ... populum ...*
... *thoram ad oculo pro populum inter ...*
... *Regibus cum arima ex ... meo ...*
De his ſupra dictum eſt, itaq; hoc etiam referri debet. Obſerva quoq; quòd ubi dam particulæ præfixæ convenire videntur ex parte patti, imò ſæpe ſolent, unde punctum ultimum vulgi ...

Suffixa generis ratione alia ſunt maſculina, alia fœminina, alia denique communia. Communia nempe Dualia quæcunq;, & numeri utriusq; primam notantia perſonam: reliquorum diſcrimen ex hiſce quoq; patebit.

Sc. 1mæ Kâlbon ſic adhiberi ſolent:

Suffixa Dualia.	Suffixa Pluralia.	Suffixa Singularia:
duarū perſar. Cor	*verſ. Cor* قَلْبُهُمَا *multi Cor* قَلْبُهُمْ	قَلْبُهُ C
	virium قَلْبُكُمَا	قَلْبُكَ M
duar. ſillar. قَلْبُهُمَا	*f. rum* قَلْبُكُنَّ	قَلْبُكِ F
	vir. illar. قَلْبُهُمْ *virtej. Cor*	قَلْبُهُ M
	f. illarum قَلْبُهُنَّ *fœf. Cor*	قَلْبُهَا F

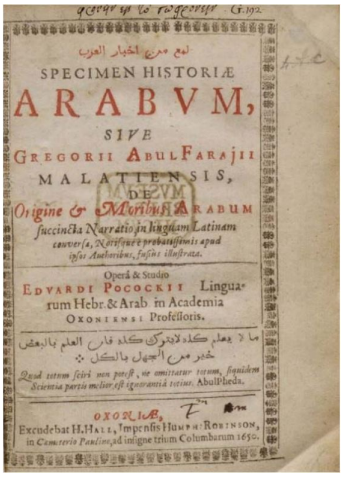
Nonnunquam de hoc genere nominibus, in dualis, & pluralibus maſculinis ſuetis tribi literam Nun, cum ſequentes affectionum nominale uſu conſtant, nec regulis ea imprehendi poſſunt.

CAPUT III.
De Pronomine.
Pronomen triplex eſt, relativum, perſonale & demonſtrativum. Relativum ratione

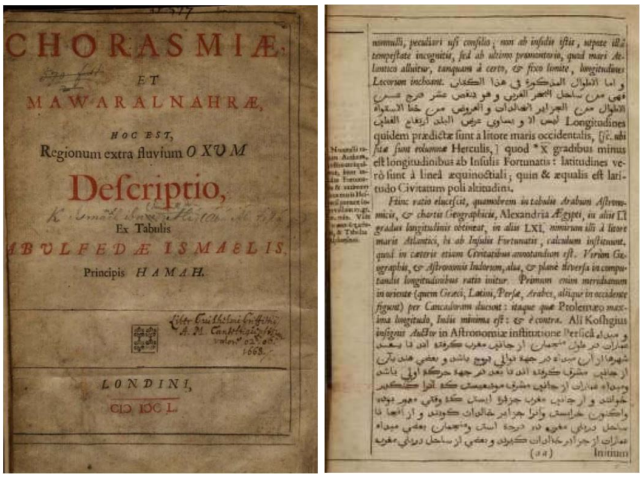
D 3 gene-

مُحَمَّدٌ
FIDES ET LEGES
MOHAMMÆDIS
exhibitæ
Ex Alkorani manuſcripto duplici, præmiſſis inſtitutionibus arabicis
AUCTORE
THEODORICO HACKSPAN,
Ling. Sanct. Profeſſore.
ALTORFI
SUMTIBUS VIDUÆ SCHERFFIANÆ.
ANNO CHRISTI
CIↃIↃ CXLVI.

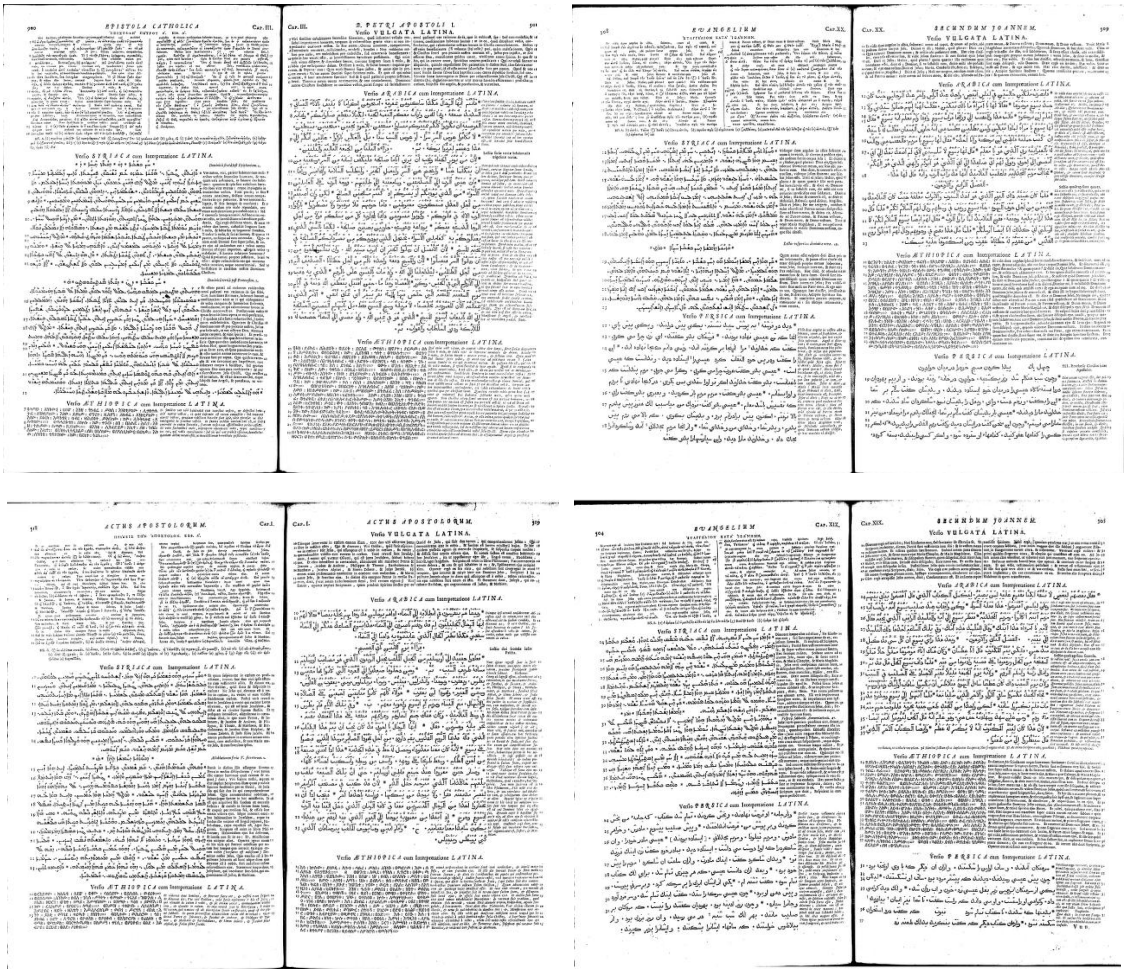
HJLA 33. Muhammadun, fides et leges Mohamdis, 1646, Germany. The Arabic fonts are more geometric, resembling Kufic style. But it works with double aligned arrangement of the text. There is no distracted rivers without using long glyph for Arabic. The Latin texts at the beginning of paragraphs are indented but is does not have the same approach for Arabic. The reading direction of each script perfectly considered by presenting Arabic texts in a separate paragraph.
An unusual approach for mispositioning the initial position of ‘me’, on the title ‘محمد’. The baseline of initial position ‘م’ instead of joining the baseline of middle position ‘ح’, joined the shoulder of ‘ح’. It makes the text to have two baseline rather than one and interact the legibility of the letterform ‘ ح’.
In Nata’liq style of Arabic it is common to have the same approach for connecting initial ‘م’ to middle letterform ‘ح’, But in that case, the bowl of ‘م’ shall draw above the horizontal stroke, the stroke shall draw diagonally, and the middle position ‘ح’ will disappear and change to three diagonal strokes continue to a middle form ‘م’.



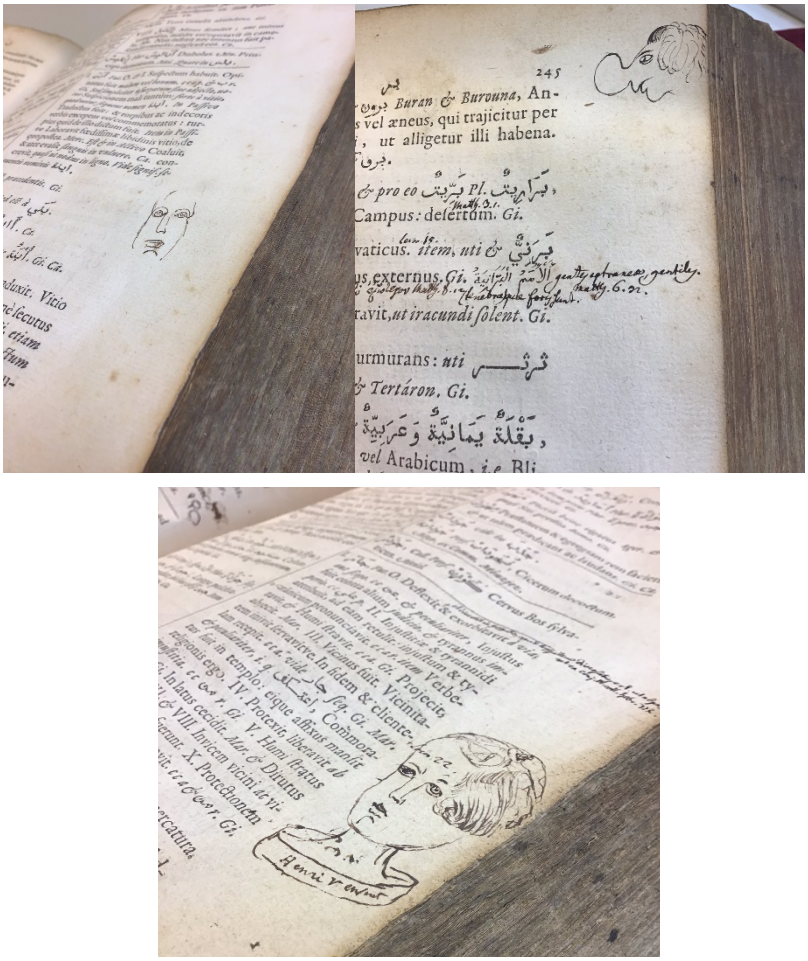
HJLA 34. Specimen Historiae Arabum, 1650, Oxford. The only evidence of this source with minimal use of Arabic text on the title page. According to Atallah, 2008) this new source of studying Islam in Europe, included Arabic texts with facing page translation in Latin. But the copy of inside pages was not found during the course of this research.



HJLA 35. Chorasmiae et Mawaralnahrae hoc regionum extra fluvium Oxum, 1650, London. Arabic fonts are fluid resemble Naskh or Rogha style with a better arrangement of body size. Use of non-vocalised font help simplicity for Arabic script in juxtaposed to Latin. The Arabic looks fluid with wide counters, while the Latin looks stable and condensed. A good management of leadings. The different reading direction in lines that mixed Latin and Arabic is a concern. More details provided in previous samples.



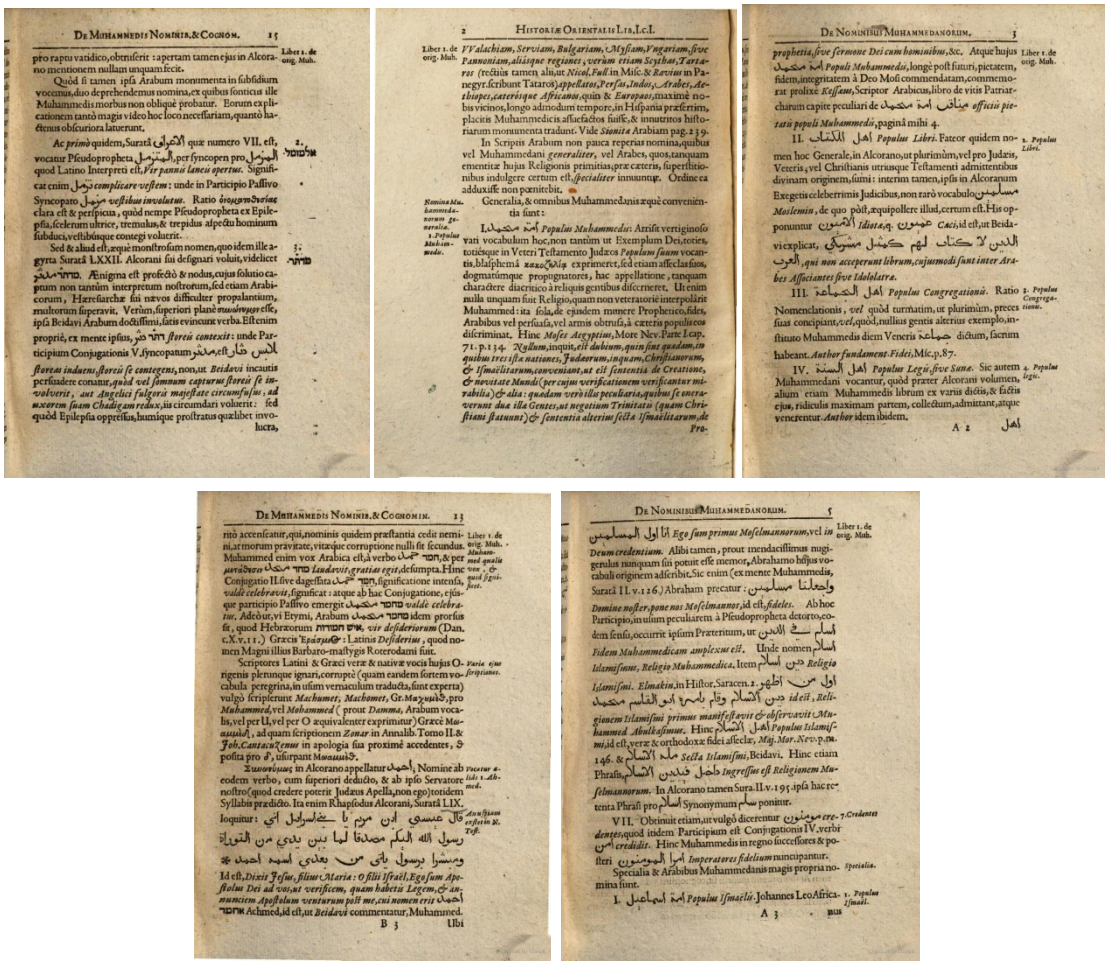
HJLA 36. 'The London Biblia Sacra Polyglotta, 1652, England. The same Arabic font used in Paris. Polygot (HJLA 28). A good arrangement of such a diverse text in one page. The Arabic font seems much bigger compared with other scripts. It is a good sample of presenting the same text is Arabic took much bigger space mostly due to the appearance of font and perhaps the nature of translation compared with other scripts. In addition, it is a good example of the extend that Latin and Arabic could present in small size, that Arabic could not be presented as small as Latin, perhaps due to vocalisation and anatomy of letterforms, it makes it difficult for printing and readability.



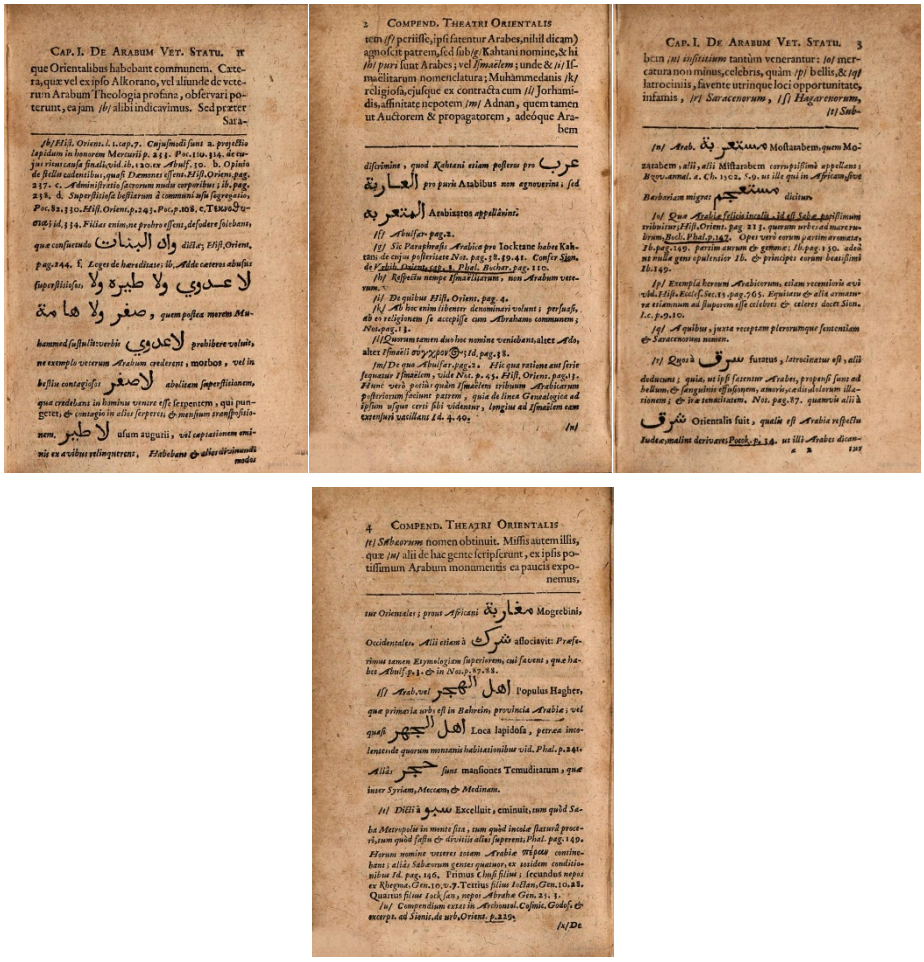
HJLA 37. Golius Dictionnary: Lexicon Arabico-latinium, 1653, Leiden. The nature of dictionary makes it acceptable to have short lines with unbalanced presence of texts. From these only evidences, different approach for anatomy of Arabic letterform ‘ر’ in different positions is observed which is not appropriate for such a context that the audience may be foreigner or beginners of reading Arabic script.



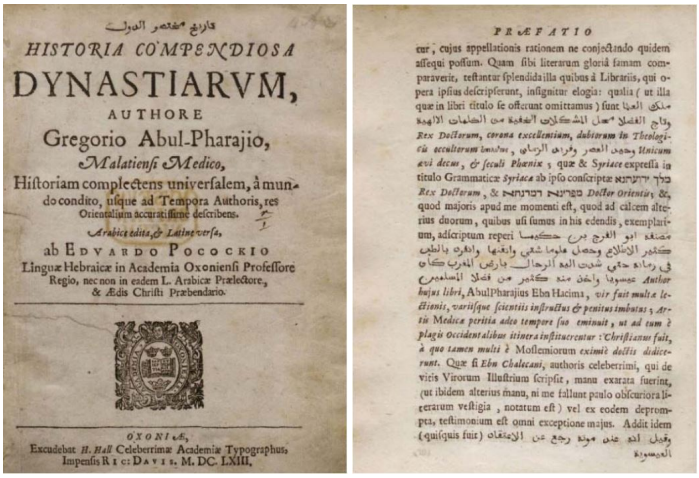
HJLA 38. Promtuarium sive Bibliotheca Orientalis, exhibens Catalogum, 1658, Germany. The Arabic seems primary due to bigger font and wider leader compared with Latin. Using long glyphs to manage rivers in doubled alignment approach for Arabic. Per the very smaller font of Latin texts and consequently more information presented in the page, it seems the equivalent text in this Arabic font needs more than one page.



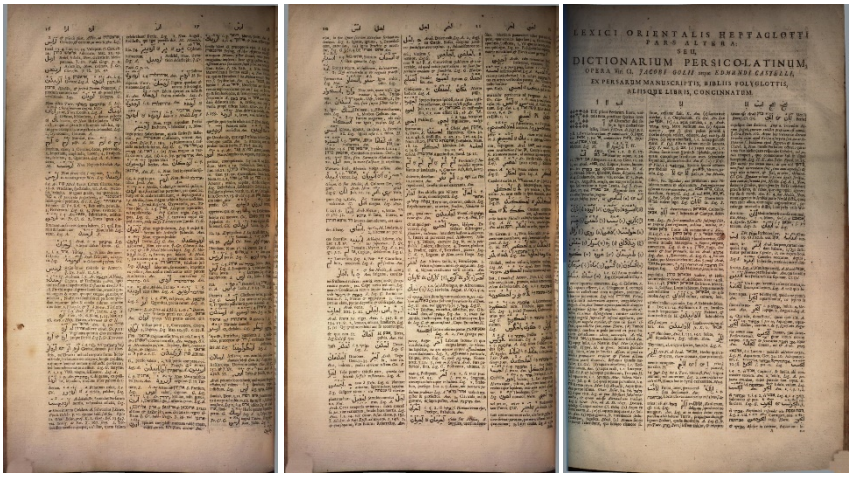
HJLA 39. Historia orientalis: Quae Ex Variis Orientalium Monumentis Collecta, 1660, Germany. The reverse ending ‘ye’, and wide counters of final position letterform ‘ne’ makes Arabic to become more fluid and spacious compared with Latin. A different use of Arabic anatomy used for Arabic texts mixed with Latin is a Line, compared with occasions that Arabic separately to adopt to the shorter Latin leadings. For instance, the ‘ن’ in ‘المومنين’ at the third line from bottom at the first image on the last row, has lower descender a smaller counter, compared with the ‘ن’ on ‘من’ in the eleventh line at the same image, or on the final image. Therefore, there is inconsistency of leading in line mixed with both scripts compared with leading of solo-script approach.



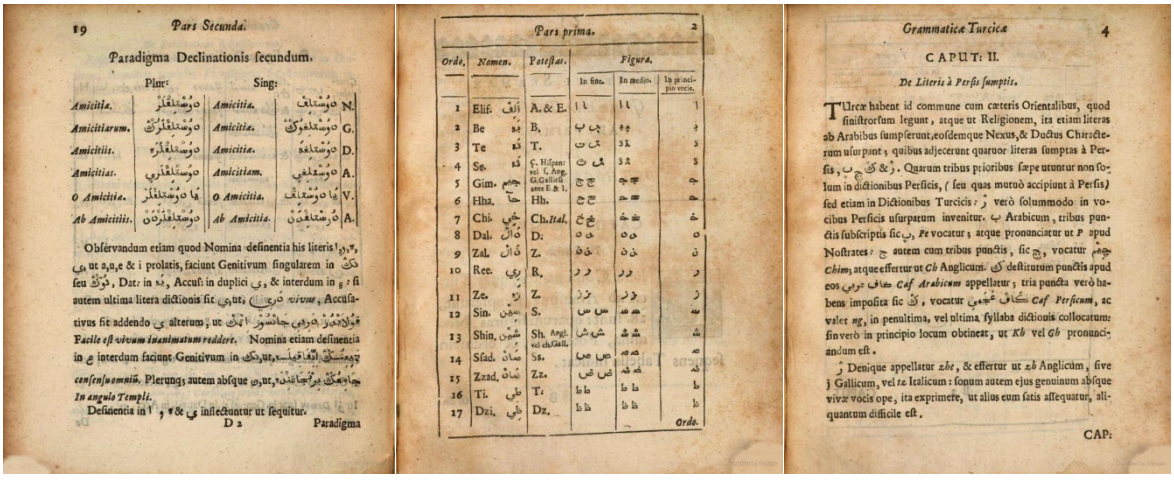
HJLA 40. Apxaio [lambda] o [gamma] ia orientalis, 1662, Germany. The lack of visual harmony, or matchmaking between Arabic and Latin fonts is obvious. There is alack of proper typesetting for Arabic fonts since characters of one-word mispositions on a line. The anatomy of Arabic letterforms does not present appropriate characteristics of Arabic script.'



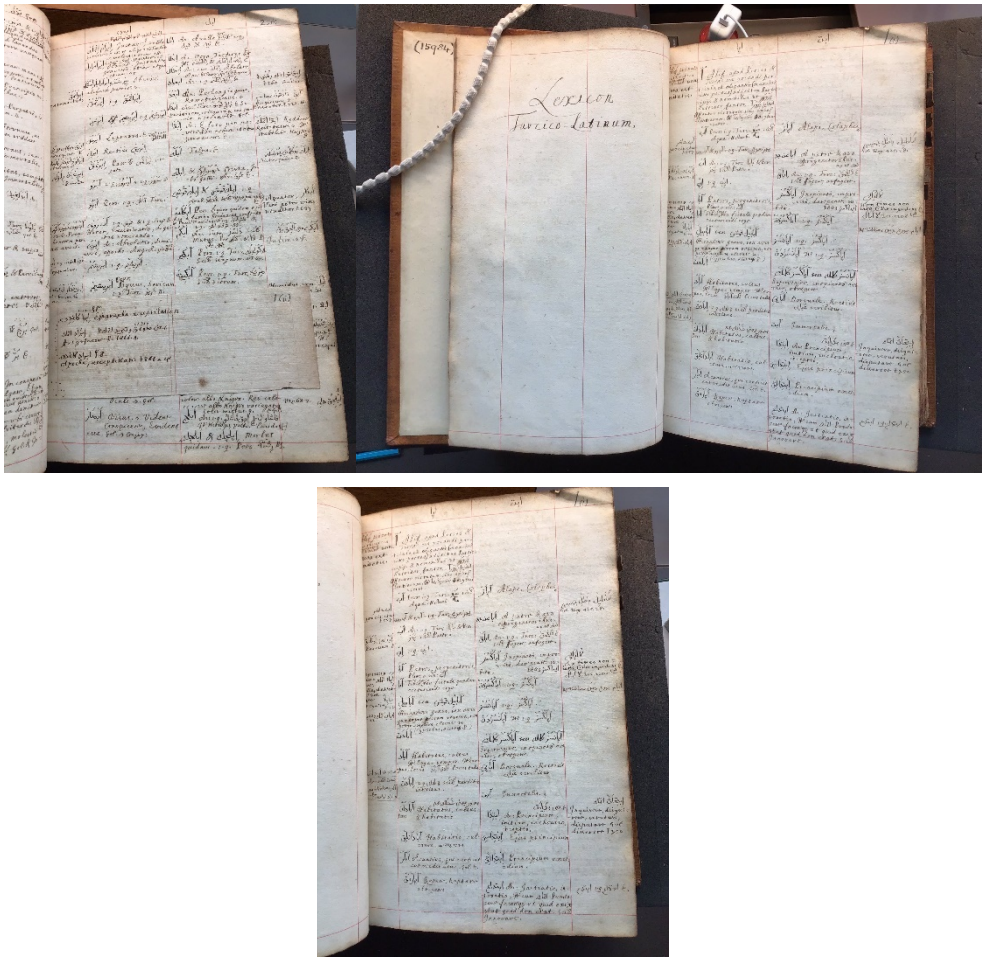
HJLA 41. Specimen Historiae Arabum', 1663, England. The leading for Arabic texts matched with the Latin text's leading. Neither of the scripts superior the other, perhaps due to less fluidity of Arabic script. Compared with precious publications, the Arabic letterform at this publication has more consistency in ascender and descender height, and the characters managed to sit on one baseline. This help with the mood of the text juxtaposition of both scripts present similar mood.



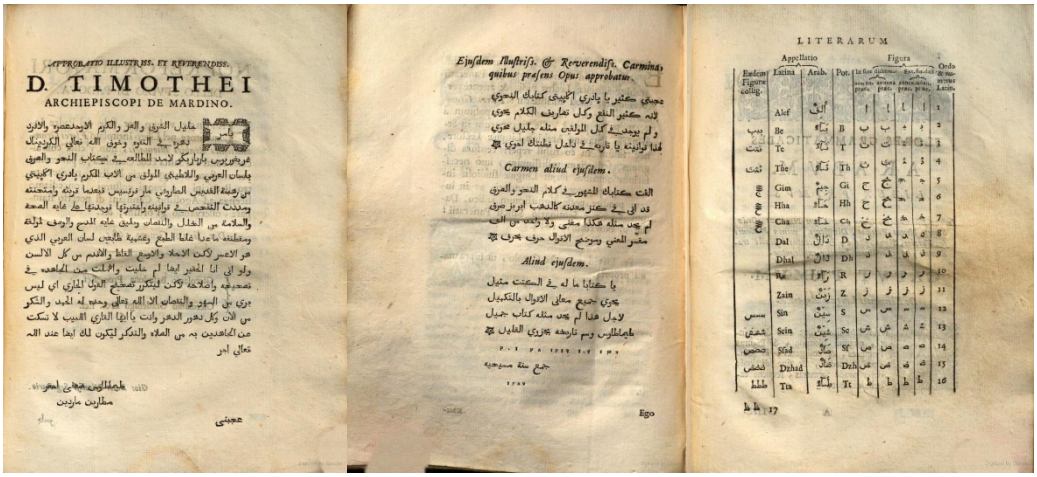
HJLA 42. Lexicon Heptaglotton, 1669, England. This multilingual dictionary used the same type format and type used in London polygot bible (HJLA 36). Using different length of Arabic text, only one letter, or a word or more than one word mix with Latin in a line, results in different inconsistent spaces between Arabic and Latin texts in different lines.

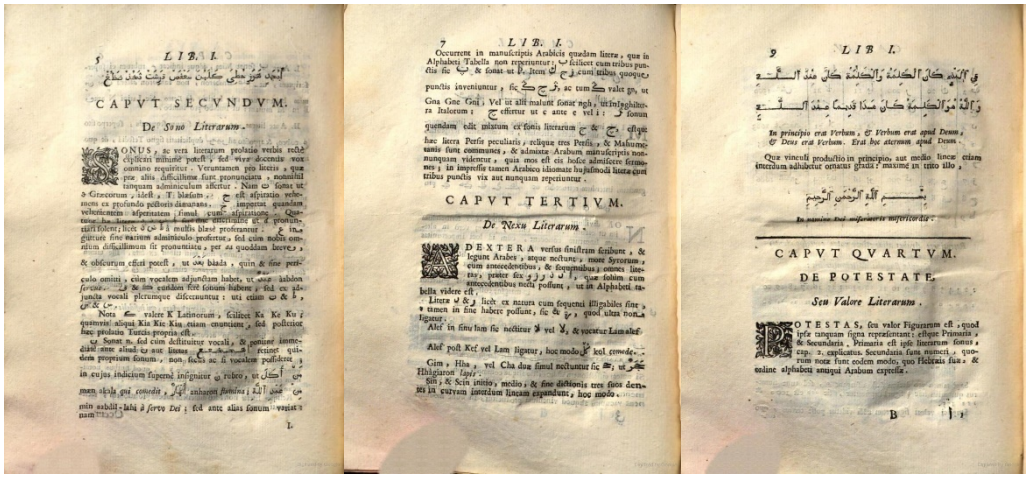


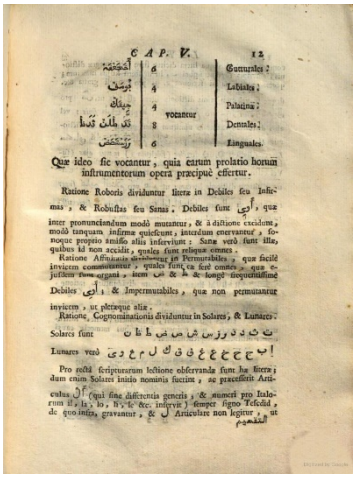
HJLA 43. Grammatica Linguae Turciae, 1670, England. The dots under descenders of some Arabic letterforms caused bigger leading compared with lines that excluded Arabic descenders with dots. For instance, the leading of fourth line on the first image is bigger due to 'ي' of 'دري'. This shows the effect of language on the layout of a page. For instance, if the Arabic texts used in this publication write in 'Persian language instead, it wonts cause this inconsistency of leading, since the letterform 'ى' in Persian' excluded the diacritics – extra two dots below the bowl of 'ى'.



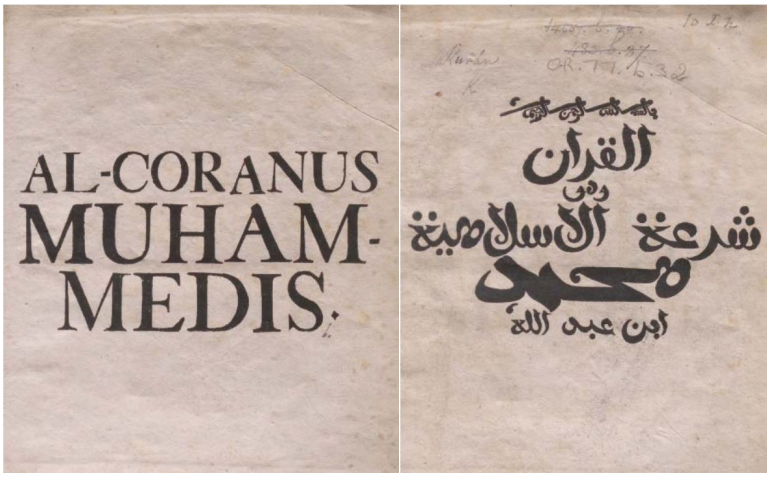
HJLA 44. Unpublished version of HJLA 43. Grammatica Linguae Turciae, 1670, England. A very neat, geometric handwritten of Arabic script. The author perfectly paid attention to having consistent ascender and descender in use of vocalisations and dots. The Arabic script in this unpublished version seems neater sit on more consistent baseline compared with the published version.



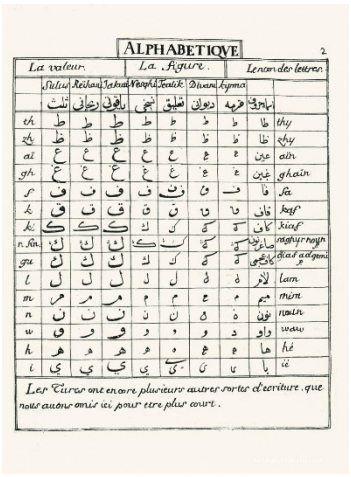




HJLA 45. Flores Grammaticales Arabici Idiomatis, 1687, Padua, Italy. Apart from mis position of some Arabic letterforms which may be due to mistakes in typesetting, this publication includes an appropriate and neat layout. The inconsistency of leading for lines including Arabic text compared with Latin lines is apparent. A different alignment of titles, with extra space to above and followed paragraphs helps intuitive identification of titles visually.



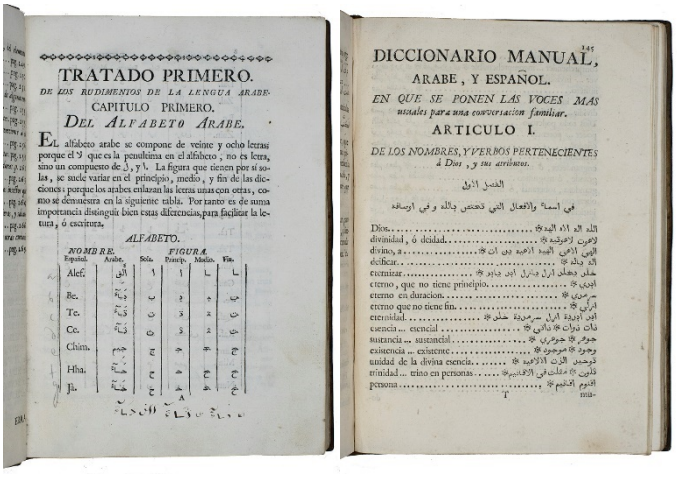
HJLA 46. The second Quran in Arabic script, 1694, Hamburg. The first evidence of ornamental Arabic typeface. This use of funny font for the holy book of Islam 'Quran' is an interesting approach. The mood and style of the typeface demonstrate the Islam religious as a less restricted concept and invite readers from younger and variable age and background. The mood of this typeface inviting reader to read the holy Quran without worrying about complex and restricted rules within Islam. It seems reading this Quran is fun! However, there is contradictory mood between what the Arabic font present compared with the Latin. The Latin typeface instead present a historical, heavy and antique belief that must take seriously. The same approach as the HJLA 33. Applied for 'Mohamamd'.



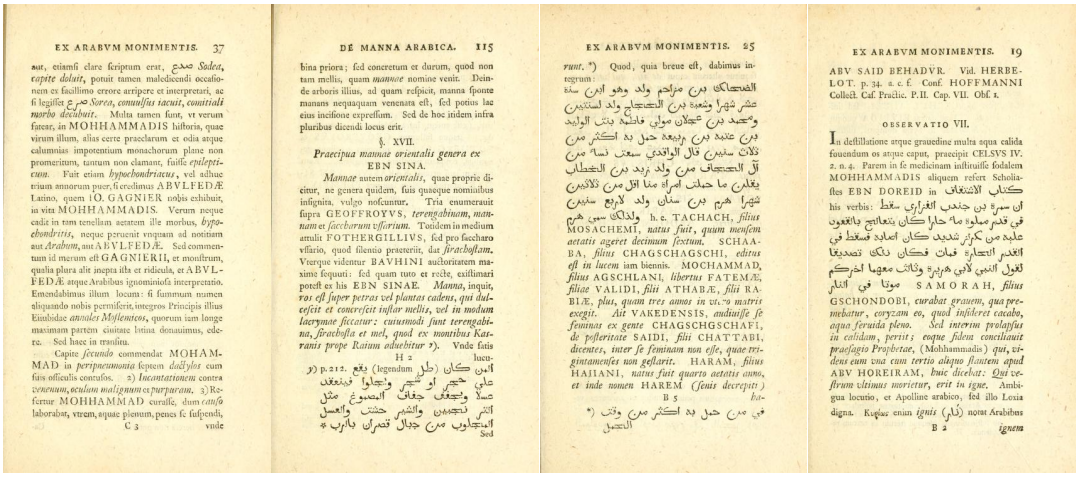
HJLA 47. Turkish-Arabic dictionary, 1728, Istanbul, Turkey. The Arabic font used in this publication claimed to be the first font preserved the beauty of Arabic script compared with Arabic fonts published by Europeans. The familiarity of the creator with the script in reading and writing, seems played an important role in creating a font that present its culture and true characteristics.



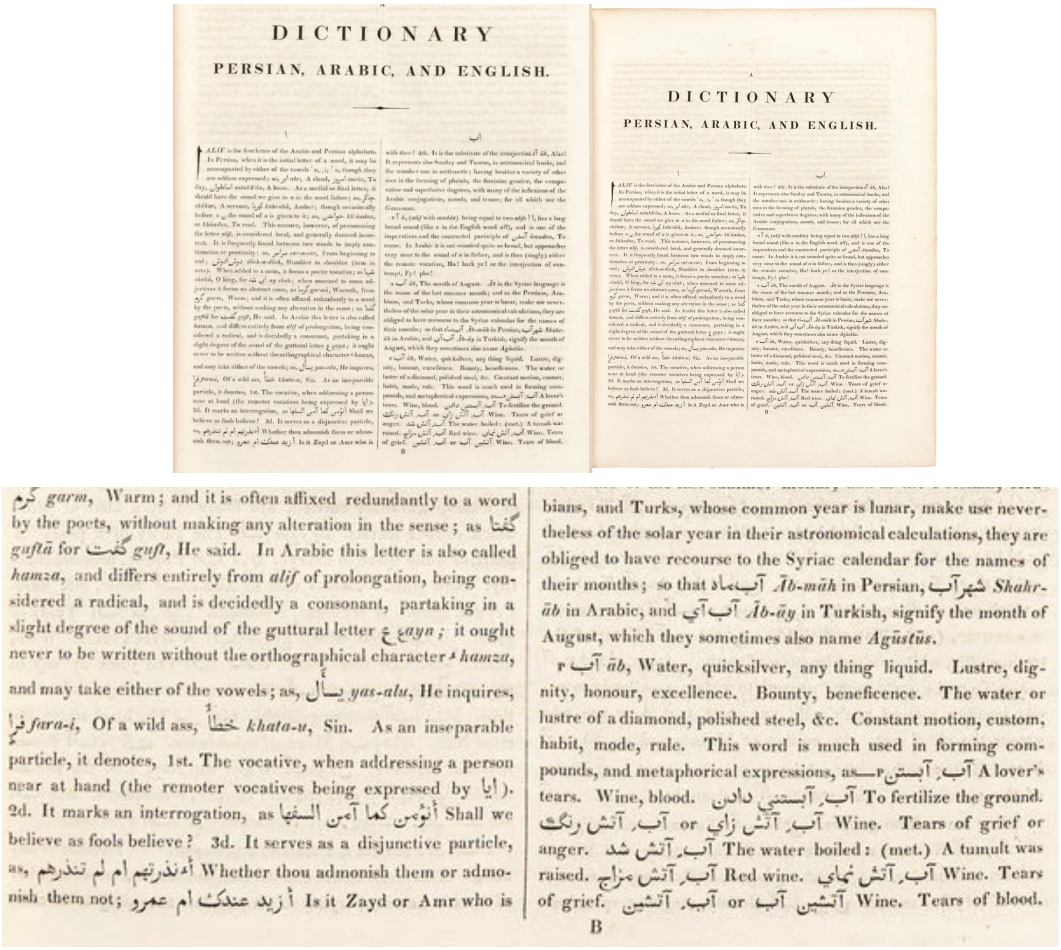
HJLA 48. Al-Magalah, Colloquia Arabica Idiomatis, 1730's, Germany. Compared with the previous publication in Turkey, this Arabic text seems unmature in terms of design and anatomy of typefaces. Inconsistent leading, and use of Latin numbers between the Arabic verses influenced the visual harmony of the layout.



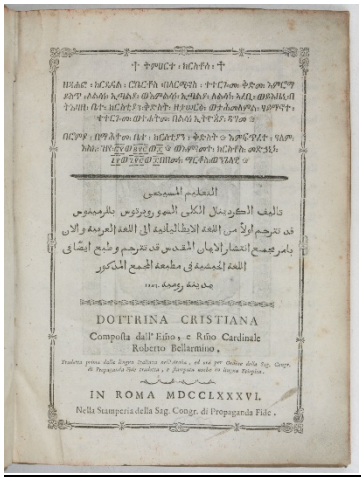
HJLA 49. Grammatica Arabigo-Español Vulgar y Literal, 1775, in Madrid. Frist evidence of juxtaposition of Arabic and Latin in index. It shows the different amount of text in each script due to nature of translation, than not always one script would be longer or shorter. This example perfectly shows in some cases few Arabic words need to explain one word in Latin, but in other cases it may results in equivalent amount of text or shorter. The title, subtitle and texts in Arabic all present in the same size and style, just hierarchy of the information demonstrate its role as the first line preserve as title. But the Latin texts, beside the hierarchy, used different style (uppercase and lowercase) and different size, to visually distinguish titles from descriptions and texts.



HJLA 50. Reiske, 1776, Leipzig, Germany. Different style of Latin script including mix of uppercase, and lowercase used to emphasise on specific words. However, due to lack of variety of written style within one font in Arabic, these emphasise is missed. Similar to some pervious publications, bigger size of Arabic font and leading, and primitive design of the font, the layout excludes visual harmony between the Arabic and the Latin.



HJLA 51. Persian-Arabic-English dictionary, 1777, Oxford, England. The Persian type looks much bigger compared with Latin. In some cases, that the leading remain consistent, the ascender of Persian texts touch descender of above lines and distract legibility of the text. In other line bigger leading applied to avoid touch above or bottom characters. This cause inconsistent leading. The Persian text seems to have potential of presenting in 2 smaller fonts, however they may have been avoiding since in smaller font the strokes may seems ok, but the tiny dots may not be visible properly.



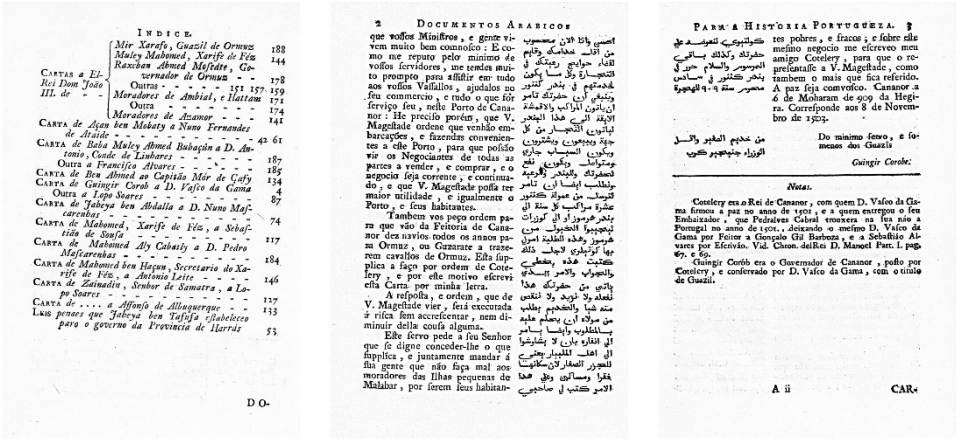
DOTTRINA CRISTIANA

Composta dall'Eminentiss. e Reverendiss. Cardinale Roberto Bellarmino.

IN ROMA MDCCLXXXVI.

Nella Stamperia della Sag. Congr. di Propaganda Fide.

HJLA 52. Dottrina Cristiana, 1786, Rome. The development of designing Arabic type considering the importance of consistent ascender and descender is obvious. Again, different size and styles used for Latin texts at the bottom, but Arabic all presented in the same size and style.



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DO-

2 DOCUMENTOS ARABICOS

que vossos Ministros, e gente vivem muito bem comnosco: E como me reputo pelo mesmo de vossos servidores, me tendes muito prompto para assistir em tudo aos vossos Vassallos, ajudalos no seu commercio, e tudo o que fôr serviço seu, nesse Porto de Cananor: He preciso porém, que V. Magestade ordene que venhão embarcações, e fazendas convenientes a esse Porto, para que possão vir os Negociantes de todas as partes a vender, e comprar, e o negocio seja corrente, e continuado, e que V. Magestade possa ter maior utilidade, e igualmente o Porto, e seus habitantes.

Tambem vos peço ordem para que vão da Feitoria de Cananor dez navios todos os annos para Ormuz, ou Curarate a trazerem cavallos de Ormuz. Esta supplica a fago por ordem de Cotelery, e por esse motivo escrevi esta Carta por minha terra.

A resposta, e ordem, que de V. Magestade vier, será executada a risca sem accrescentar, nem diminuir della cousa alguma.

Este servo pede a seu Senhor que se digne conceder-lhe o que supplica, e juntamente mandar á sua gente que não faça mal aos moradores das Ilhas pequenas de Malabar, por serem seus habitan-

PARA A HISTORIA PORTUGUEZA. 3

tes pobres, e fracos; e fobre elle mesmo negocio me escreveo meu amigo Cotelery, para que o reprefentaffe a V. Magestade, como tambem o mais que fica referido. A paz seja comvosco. Cananor a 6 de Moharam de 909 da Hegira. Corresponde aos 8 de Novembro de 1503.

Do mimimo servo, e fo-menos dos Guazis

Guingir Corobe:

Notas.

Cotelery era o Rei de Cananor, com quem D. Vasco da Gama firmou a paz no anno de 1502, e a quem entregou o seu Embaixador, que Pedralves Cabral trouxera na sua ida a Portugal no anno de 1501., deixando o mesmo D. Vasco da Gama por Feitor a Gonçalo Gil Barbosa, e a Sebastião Alvares por Escrivão. Vid. Chron. delRei D. Manoel Part. I. pag. 67. e 69.

Guingir Corób era o Governador de Cananor, posto por Cotelery, e confervado por D. Vasco da Gama, com o titulo de Guazil.

A ii CAR-



6 DOCUMENTOS ARABICOS.

N. III.

COPIA DA CARTA,

Que ElRei D. Manoel eſcreveo aos moradores de Azamor em idioma Arabico.

AOs Benemeritos, Ancioãs, Maiores, Principaes, Administradores, Conſelheiros, Plebe, e mais moradores de Azamor.

Nós D. Manoel por graça de Deos, e fua mifericordia Rei de Portugal, e dos Algarves, Senhor de Guiné; Conquiſtador dos Climas Occidentaes, Cidades, Ilhas, e mares d'elles: Climas, e Cidades da India, e Perſia: Huma fasdação igual á voſſa vos enviamos. Depois da qual vos damos a ſaber, que chegou-nos a voſſa Carta, e eſtamos inteirados da voſſa narração.

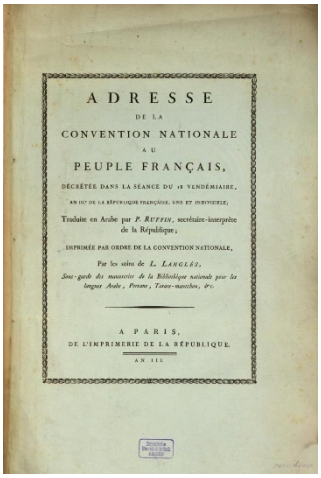
Nella nos dizeis que eſtais arrependidos do ſucceſſo, que aconteceo no voſſo porto, e do que obraſtes, e que os voſſos corações eſtão unanimemente conformes, e a voſſa palavra he huma, e nos pedis perdão do acontecido, e que eſtiveſſemos pela paz, e pacto, que entre nós eſtá eſtabelecido, e conſeſſaſtes a voſſa culpa, pedindo-nos, que vos aceitaſſemos, e que guardareis a boa fé no noſſo

HJLA 53. Documentos Arabicos, 1502-1528, Para a Historia Portugueza, 1790, Lisbon. Using narrower column for Arabic compared with Latin aid a balanced texture between Arabic and Latin. The Arabic text due to its bigger body-size may seemed superior if the same column width as the Latin applied to the Arabic. But by reducing the column width it controlled the texture of the scripts.



HJLA 54. Kitab Tafsir-Al-Zabbour – Al-Ilahi – Al – Sharif-Ibn-Al-Raja-Al-Jalil, 1792, Vienna. Different leading makes the facing juxtapose Latin and Arabic lines sits on different baseline. The use of initial capital of the Latin text is not wise unless for emphasise on superiority of Latin script. Since the is a lack of such a typesetting for Arabic script. The different arrangement of final lines for Latin compared with Arabic gives emphasise on Latin text. This makes the eye catch the Latin script prior to the Arabic.





HJLA 55. Adresse de la convention nationale au peuple français, 1794, France. A use of red and black colour in Arabic text help emphasis on preferred words. However, the Latin page remain solely black with a different broader. It is interesting that the boarding for each script perfectly match with the script culture, but these different approaches for facing Arabic and Latin pages keep them ununited. It seems these two scripts purposely remained unmarried and ununited.


امثال لقمان الحكيم

LOCMANI
SAPIENTIS
FABVLÆ
ET
SELECTA QVÆDAM ARABVM
ADAGIA.
Cum Interpretatione Latina & Notis
THOMÆ ERPENII.

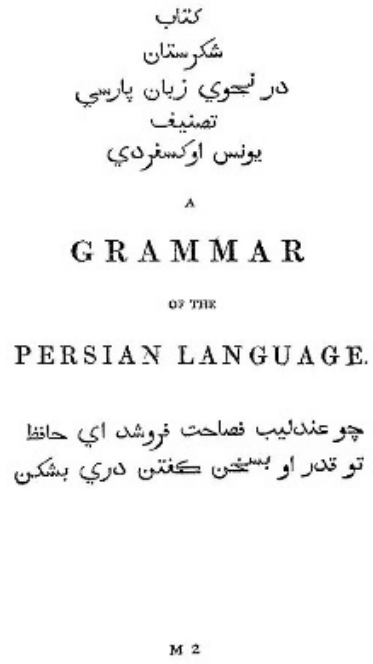
LVGDVNI BATAVORVM,
APVD IOANNEM MAIRE.
cIↃ IↃ CXXXVI.

أمثال لقمان الحكيم

FABVLÆ LOCMANI
SAPIENTIS.

أسد وثوران

HJLA 56. Fables of Luqman, 2nd ed, 1795, Cairo. It is difficult to assess the design quality of bi-scriptual approach from the two-page due to minimal bilingualism approach is each page. However, it is considerable that although similar leading applied to all Arabic text, but due to variable vocals and dots in each Arabic ligature, the leadings seem inconsistent. An interesting attempt for stimulating Latin's ornamental initial letter approach for Arabic. However, the whole word used instead of singular letterform.

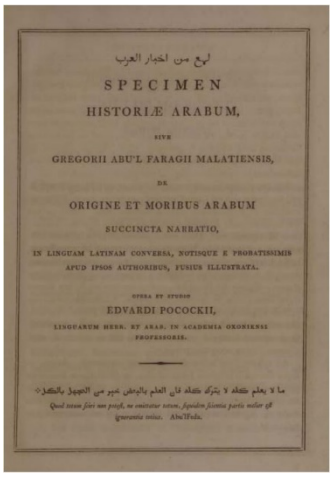

كتاب
شكرستان
در نحوي زبان پارسي
تصنيف
يونس اوكسفردي

A
GRAMMAR
OF THE
PERSIAN LANGUAGE.

چو عندليب فصاحت فروشد اي حافظ
تو قدر او بسخن گفتن دري بشكن

M 2

HJLA 57. Sir William Jones's Grammar of the Persian Language, 1807, Cambridge. England. The design of the Arabic font seems primitive. It seems the designer attempted to make the fluid shapes of Arabic more Geometric. Th same approach as the 'م' to 'ح' in HJLA 33, and 46, applied here for letters before 'ح' and 'خ'. It seems connection of middled positioned anatomy of 'ح' was a challenge for designers.


لمع من اخبار العرب

SPECIMEN

HISTORIÆ ARABUM,

SIVE

GREGORII ABU'L FARAGII MALATIENSIS,

DE

ORIGINE ET MORIBUS ARABUM

SUCCINCTA NARRATIO,

IN LINGUAM LATINAM CONVERSA, NOTISQUE E PROBATISSIMIS APUD IPSOS AUTHORIBUS, FUSIUS ILLUSTRATA.

OPERA ET STUDIO

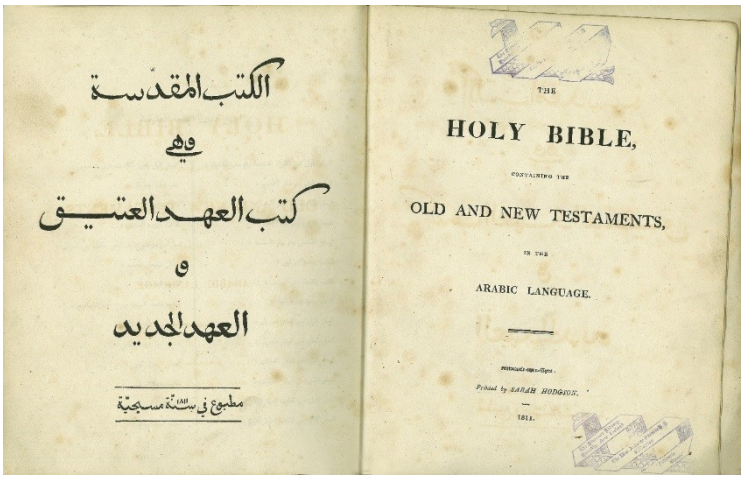
EDVARDI POCOCKII,

LINGUARUM HEBR. ET ARAB. IN ACADEMIA OXONIENSI PROFESSORIS.

ما لا يعلم كله لا يترك كله فان العلم بالبعض خير من الجهل بالكل

Quod totum fieri non potest, ne omittatur totum, siquidem scientia partis melior est ignorantia totius. Abu'l Feda.

HJLA 58. Specimen historiae Arabum: Accessit Historia veterum Arabum. 1806, Oxford. The second edition of HJLA 28. the previous book, it is interesting to see in this version the layout's quality improved by a better decision about the Arabic typeface its size and arrangement of layouts. The development of Arabic typeface design in managing smaller ascenders and descenders and readability of Arabic is smaller size is apparent.


الكتب المقدسة

وهي

كتب العهد العتيق

و

العهد الجديد

مطبوع في سنة ١٨١١ مسيحية

THE

HOLY BIBLE,

CONTAINING THE

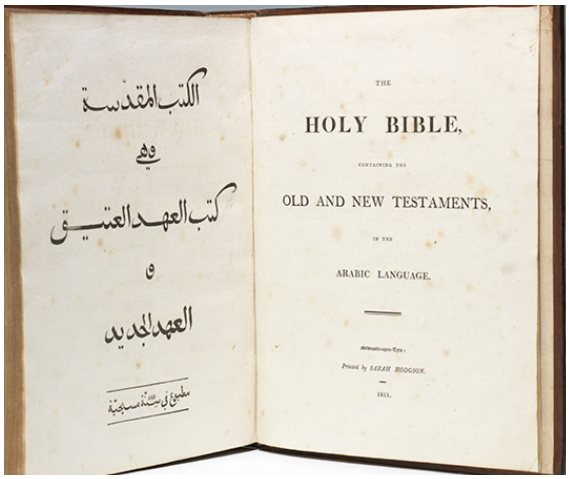
OLD AND NEW TESTAMENTS,

IN THE

ARABIC LANGUAGE.

Printed by SARAH HODGSON.

1811.


الكتب المقدسة

وهي

كتب العهد العتيق

و

العهد الجديد

مطبوع في سنة ١٨١١ مسيحية

THE

HOLY BIBLE,

CONTAINING THE

OLD AND NEW TESTAMENTS,

IN THE

ARABIC LANGUAGE.

Printed by SARAH HODGSON.

1811.

HJLA 59. Arabic bible, 1811, Newcastle. Designers' expertise in working with Arabic layout is appraisable. It used Wilkins-martin Arabic types. The font present Nasta'liqu style of Arabic. Use of variable stroke width of Arabic match ed with the Latin serif font. Different font sizes used for Arabic, however there is a lack of resembling the bold version of the Latin for the main title.

Appendix 6: Principles in Temporal Environment

Not only the different combinations of scripts in a bilingual layout affect a designer's decision about how to arrange and apply typographic elements. But also, the stability and movement of the type – static or kinetic –, alongside if the stabled or motion type is presented within a two-dimensional or three-dimensional layer – print, digital, or temporal environments –, provide variable design challenges which require a different arrangement of typography elements and type decisions. Thereby, bilingual typography in a static environment requires a different typographic guideline compared with bilingual typography in 'temporal environment'.

I investigated bi-scriptual Latin and Arabic approaches in a temporal environment to identify similarities and differences in guiding principles in a static typographic environment compared with a temporal environment. Temporal typography refers to either the type presented in the digital environment, but it might not be in motion (serial presentation), and the animated letterforms and type (Kinetic typography) (Brownie,2015)[216].

Depending on the situation, the type in temporal may include Static text in digital environment[217] that text presents in two different layers such different pages of a website. As expressed by Wong (1995), cited in Brownie (2005), 'such text is only apart from its cousins in print by the fact that its appearance links to a particular moment in time.' This suggests the text displays in websites and blogs could follow typographic principles that rules static, traditional print typography. However, the technology specifically with the growth of AI, could facilitate more reading conditions which may not be available in the p rint environment. In a digital environment, users could have the facility to enlarge the screen, change the text's font size, change the typeface and colour of the background of the text. For example, the Oman government published the first interactive online Quran (2017), which allows the audience to change the typographic elements of the text[218]. Therefore, the layout and message are static, and does not require motion of the reader, but the typographic elements could be changed. In this case, for the same project, content

[216] Categorisation of temporal typography proposed by Barbara Brownie (2015: Xii)

[217] Temporal environment also includes texts in 3d or urban environments.

[218] See digital Quaran published by the government of Oman, which enables the audience to apply the different calligraphic style of Arabic script to the text based on their preferred visual taste. https://www.aa.com.tr/en/middle-east/oman-unveils-world-s-1st-interactive-calligraphic-quran/842512.

and readers, there are more than one typographic layout proposal on the same platform. It hugely aids designers to respond to different needs of different audiences.[219]

Considering the argument of Ikonen (2003), a distinctive line between static, traditional print typography and temporal environment, specifically kinetic approach, is 'text motion[220],' or as it is expressed by Woolman and Bellantoni (1999, as cited in Brownie, 2015), it is called 'type in motion'. The action of movement and inconsistency provided to the applied typography elements due to the movement of the text, over time, add a layer of expressive quality to type (Worthington, 1998). The letterforms may become 'kinetic' (Helfand, 1997), which allows designers to present a text in an exaggerated and expressive way (Kac, 1995). Express a mood by the visual 'behaviour of letterforms[221]' rather than the literal meaning behind the words.

An investigation on bi-scriptual kinetic typography, carried out during phase one of this research – found no evidence of simultaneous juxtaposition of Latin and Arabic Kinetic typography[222]. But there is evidence of asynchronous bi-scriptual Latin and Arabic approaches in kinetic typography including morphing Latin letterforms to Arabic Letterforms such as the practice of Khajavi (2018) in Figure 42. Due to the lack of simultaneous Latin and

---

[219] Nowadays, considering dyslexia in User Experience Design is a key role. As responding to readers with dyslexia, Microsoft offers an option, allowing users to change the background's colour to yellow on MS Word.

[220] According to Brownie (2015) motion typography is called kinetic typography.

[221] According to Brownie (2005:6) the behaviour of letterform refers to the value and feature of a letterform movement and reformation.

[222] Catherine Dixon (2002:8) in analysis of Latin typography in different environments observes, "text is increasingly found in the environment outside of print". However, it is believed that while typography moved towards temporal typography in the West, Arabic script took a different approach in order to bring the typography outside of print. In *In praise of the world: Political Graphics in and through the 'Arab Street' of the; 60s and 70*, Zeina Maasri discusses the use of text to create spaces for critical public (political) debate in the 'Arab Street' through posters and graffiti. Fadi Shayya's *production of a pseudo-public space: A Reading of Park Closure in Beirut* and Todd Reisz's *They Say There is No Public Space* discuss the appropriation of public space and taking territories from opposite angles. Two designers – graphic designer Gerrd Hadders, in *Don't Panic! Keep It Clean! Monumental Type and the Pleasure Principle*,' and architect Sinan Hassan, in *Architecture and Language: Geometry as Poetry, Typography as Typology, and Designing as Writing* – write about the integration of text and language in the urban environment to enhance spaces or engage the public, either in the rejuvenation of delinquent spaces in the city or the creation of spectacular landmarks. In addition to the points raised by the aforementioned authors Hashim Sarkis, in *Inscriptions* discusses the integration of inscriptions and graphics into the surface of architecture and role text plays in mediating the structure and navigation of a site or architectural space. In addition, Howayda Al-Harithy (2010) mentioned that Arabic inscriptions have played an important role in the architectural production of the medieval Arab cities since their first appearance in the Dome of the Rock in Jerusalem (691AD). At first, inscriptions were always religious ones, especially Quranic Verses but after a while, they took political significance as well. Initially, inscriptions were only placed inside religious buildings, addressing the faithful Muslim population. But after a while inscription were part of the production of outside urban space. For example, throughout Cairo, whether ceremonial avenues or major market streets, were marked by distinct, legible writing charged with religious, political and social meaning. (Typographic Matchmaking in the City, 2010).

The existing projects about the function of Arabic typography out of Print environment sheds light on the use of type in architectural spaces in a static way, such as the 'Typography Matchmaking in the City', which was mentioned previously (AbiFarès, 2010).

Arabic approach, I investigated monolingual Kinetic approaches to identify the typographic similarities and differences between Static traditional print approach.

The result shows that the Arabic world has not produced as much kinetic typography as the English-speaking world. In the opinion of Harik (2019), 'we are still witnessing a modest Arabic temporal typography, by far unequal to its Latin counterpart.' Moreover, there are a limited number of techniques used in modern Arabic temporal typography, mostly used fade in and fade techniques but no more elaborate Kinetic transformations (Kinetic typography, 2012; and Dreambox, 2012). For example, according to the Arabic Kinetic typography proposed by Dreambox, the mentioned technique has been used on the TV credits in Arab Channels, with an additional effort to present the writing direction of the word. There is not much that I have identified so far, sophisticated Kinetic typography or transformations. Almost all Arabic Kinetic Approaches consider one word as a ligature and apply the techniques into the whole concept. As Khajavi (2019) observes that, 'the limited number of contemporary Arabic animations emphasizing that most of them display fundamental temporal events.'

These typographic aspects, such as 'behaviour of letterforms', 'and use of typographic digital techniques' are not applicable in static typographic approach. Mutually, printing material and tangible substrates[223] which are inseparable part of traditional print typography is not tangible and applicable in kinetic approaches. Furthermore, different units of type use in kinetic approach compared with static typography. For instance, smallest unit of type use in kinetic approach in strokes[224], and use of individual letterforms is a superior approach compared with use of a word or sentence. However, I didn't not observe any evidence of using Arabic strokes in Arabic Kinetic approaches, while there is much evidence of using Latin Strokes in Latin Kinetic approaches. But in the statistical environment, especially informative typography, the smaller unit of type used is letterforms. Strokes do not play a role in arrangement of a typographic layout, unless in practice of typeface design. Instead, letters, words and mixture of words in a sentence or paragraph are considerable. Since bigger units of type use in Static typography compared with Kinetic approach, minute corrections[225] become more complex.

[223] For more information about Substrates (Surface) and materials in Print typography refer to Appendix 1, AP1.1.
[224] Strokes are the smallest part from the anatomy of a letterforms.
[225] For clarification on minute corrections in typography refer to Samara (2014).

Relationship between audiences and typographic layout is different in a temporal environment compared with a static environment. In a temporal environment, the information may only be available for a limited time. [226]

Besides, motion of either audience or typographic layout may be a necessary action to decipher readable content in a temporal environment.

As research by Brownie (2015) about a new direction in kinetic typography shows that a typographic construction may not be recognisable in a static situation; such as kinetic typographies that requires the audience action to decipher appropriate moment and angle for the typographic text to become recognizable. The point is, in either of these typographic sample's stability or movement of either factors – the bilingual layout, the audience or both – in different bilingual contexts provide different aspects for designers to consider. Stability of both typographic layout and the audience, or movement of one or both, influenced the audience experience in reading the data. Which consequently affects the bilingual layout's objectives and the designer's decision about typographic elements. The main factor that causes the difference is 'movement'.

Analysis of 'scrolling typography[227]', shows the arrangement of type remains consistent, but the whole text moves in relation to a frame (ibid, p;7). For example, the type may move from top to bottom as it is presented in Film title credits. In this case, the typography elements as in print, including typefaces, point sizes, line length, leading, tracking and Kerning, remain the same. Imagining a bi-scriptual Latin and Arabic in scrolling typography, different move in relation to frame may need for Arabic compared with Latin, depends on readability issues influenced by digital screen typography. I assume approaching visual excellence between Latin and Arabic, and arrangement of texts may follow totally different rules due to movement and limited reading time.

Analysis of 'Dynamic typography' revealed an interesting challenge in bi-scriptual approaches. Dynamic typography refers to the situation that a letterform or a single word moves individually, independent of other letterforms and words within the type (Brownie,

[226] As part of the relationship between the audience and typographic layout, of course desired decision about the location and position of the layout plays an important role. Since these issues are excluded on typography principles, it is out of the scope of this research to analyse it in more detail. The important issue for designers to consider is that depending on the relationship between the audience and the layout, audiences may not be able to justify the reading time and speed.

[227] Brownie's (2015) categorisation, of the sub-categories of Kinetic typography is global motion, which is divided into two groups of 'scroll typography' and 'dynamic layout.'

2015). Because of this, some letterforms or words might remain static, while the rest are in motion, as well as the motion style or behaviour of one letterform or word might be different from one another. Notably, in this specific situation, as described by Brownie (2015:11), 'Dynamic layout treats the space between letters and words as flexible. It assumes that there is no fixed spatial relationship between the forms on the screen.' This statement, which describes the features and characteristics of dynamic typography, is the most challenging issue for bilingual typographers, especially if it deals with a bi-script bilingual typographic composition like Latin and Arabic, which respectively write in Block Letter and Cursive style. This characteristic to break the fixed space between letterforms and make it flexible works with Latin letterforms, since, by nature, the letterforms within a word are disconnected. But Arabic script is a cursive style, letterforms based on their position in a word, may connect to the previous and forward letterform via an additional stroke called 'glyph.' In this case, the disconnection of letterforms within a word affects the readability. As follows, the challenge for designers is not only the visual excellence between the shape of letterform but considering the readability of the texts within a cursive script. This factor also may require an in-depth investigation in the files of Cursive script temporal typography to analyse the behaviour of letterforms of a cursive script.

I have observes that there are not any attempts in current Arabic temporal typography to break down each letterform, which I feel is particularly important because any exploration of different letterforms into these two scripts requires thinking about letterforms in their parts.[228]

Construction typography is a subcategory of fluid typography from the branch of local kinetics of Kinetic typography. Constructions refer to the situation that the anatomy of letterforms breaks into different meaningful parts, each position in a separate layer. The alignment of the whole parts introduces the identity of a letterform. In construction typography, the text requires an action to reveal itself, either by the movement of the letterforms or the movement of the audience. At this specific kind, the connection between the type and audience is a mutual relationship. It is only in a particular position and point of view the type might not be readable at all. Still, it exists, just waiting for the audience to

[228] This may be due to the lack of defined anatomy of letterforms for Arabic script. Full analysis of Anatomy of Latin and Arabic letterforms is available in Chapter 5.

decipher and recognize the correct position that the text would be legible. Construction may rest in a 3D or 2D environment, or as a 3D object. Imagine a bilingual 3D object, including Latin and Arabic script. Latin script is geometric, and all letterforms consist of Vertical, horizontal, diagonal, and curved lines. While Arabic script is fluid and letterforms include undefined lines, which is a mixture of primary and straightforward lines. In this case, a new investigation is needed to identify if the different anatomy of Latin script compared with Arabic allows achieving bi-scriptual Latin and Arabic in a construction typography.

A gap identified within this area of research, that of the need for bilingual kinetic typography stem from the understanding that possessing an appropriate static typography system in Latin Typography has been an important issue to move towards kinetic typography. According to Ford et al (1997:269) – in Brownie (2015), "Existing taxonomies of 'typographic forms' for the screen have largely been based on the 'tradition of print typography." Latin script achieved a proper system of static typography before it moved towards temporal typography. As Brownie (2015) stated in her writing on Latin temporal typography, "static typography has been thoroughly categorized. Existing classification systems provide typographers with valuable tools for understanding their medium, and a language with which artifacts and experiences of artifacts can be efficiently described." Thereby, the categorisation and analysis of the artefacts in static environment bilingual typography would feed future research on analyse of bilingual motion – Kinetic – Latin and Arabic typography[229].

Research (Bringhurst, 2002; Wong, 1995) shows, typography elements for static environments are different compared with temporal typography. According to Bringhurst (2002: 107), typography elements in static typography include 'typefaces, point sizes, line length, length, line-spacing (leading), and letter-spacing (tracking), and adjusting the space between pairs of letters (Kerning).'

Hilary, Kenna (2014), discussed a major difference in principles of screen typography and printed typography is the time, motion and sound, which are not applicable to the printed ones. Besides, Wong (1995), mentioned, in the temporal environment, the typographic elements of print influenced by the behaviour of letterforms. According to Brownie (2005:6)

[229] Analysis of the Anatomy of Arabic letterforms and providing a comparison with the anatomy of Latin scripts, is also beneficial for practitioners of Arabic and Latin kinetic typography.

the behaviour of letterform refers to the value and feature of a letterform movement and reformation. In this case, Studies (Ikonen, 2003; Worthington,1998; Helfand, 1997 and Kac,1995) show the movement and behaviour of the texts provides a layer of expressive quality to the letterforms.

This new feature, 'behaviour' of letterforms, is exclusive to the kinetic typography principle; and required a distinct set of research to evaluate the 'behaviour' of movable Arabic letterforms juxtaposed to moveable Latin letterforms. It is a complex issue since in moveable Arabic messages the letterforms may connect to each other, and one word may be considered as one glyph – Character[230]–. While in moveable Latin script each letterform is considered as a separate glyph. This means in juxtaposition of Latin and Arabic scripts, the 'behaviour' of one Arabic glyph may include multiple letterforms linked to each other while in Latin, it considers a single independent letterform.

Research by (Wong, 1995; Bringhurst 2002) proves the capacity of the human mind to read and remember information in a stable situation is different compared with a situation where either the text or the human body is in movement. For example, film credit titles are linear; over time audiences lose the data since they cannot control the progress of presenting the information. But the information presented in a website, 3D kinetic examples, provides readers with the opportunity to control the process of the displayed information according to the time needed for reading. Therefore, in a bilingual typographic layout with linear process, presence of the information, the level of simplicity of typefaces, font sizes should be considered in line with the lower capacity of the human mind to read and remember information compared with a print/static typography.

Movement of text which affects the audience experience and human capacity on reading and remembering the data is more considerable in temporal typography compared with a static environment. Other factors, such as, increasing reading time, and movement of audience when the layout is static are existing in both static and temporal environments, but their effect on audience experience and designer's decision about typographic elements are totally different. For example, the reading time in a temporal environment that the recognition of the type depends on the audience's action to decipher the readable moment, not only depends on the typographic element, but it largely depends on the audience's

[230] For definition refer to Appendix 1, Section AP1.9.

correct movement, his experience, intellectuality and the interior design of the space. Therefore, 'movement' is one of many objectives that hugely effects on the audience's needs and experiences in reading a bilingual layout.

A published project report by Kinnear et al. (2012), in the subject of 'analyses of the bilingual signs on road safety in Scotland,' draw attention to human's limited processing capacity which results in the influence of bilingual and multilingual road signs on the safety risk of drivers.

In conclusion, the difference in 'typography elements' in a static environment compared with a kinetic environment, needs a different bilingual typographic guidance for a static environment compared with a kinetic environment.

There are two issues to consider for the development of bilingual typography in the kinetic environment. First, bilingual kinetic typography requires distinct 'typographic guidelines' compared with static typography. Secondly, to achieve high-quality typography in a Kinetic environment, a good knowledge of principles of design in static bilingual typography is required. With this regard a good knowledge in the anatomy of letterforms is necessary to deal with behaviour letterforms in a kinetic environment. Hopefully, this research, by developing principles of bilingual typography in a static environment, paves the path for further studies in bilingual kinetic typography.