Dialect Convergence in Egypt: The Impact of Cairo Arabic on Minya Arabic

Saudi Sadiq

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إهداء إلى ذكرى

أبي، وأخي، وحميّ،

حباً، وعرفاناً، واعترافاً بما علمتموني.

اللهَ -تعالى- أسألُ أن يجزيكم عني

خير الجزاء.

To the memory of

my father, brother and father-in-law,

in acknowledgement and appreciation of everything

you taught me. I ask Allah (SWT)

to give you the

best reward.

Abstract

This is a sociolinguistic study of the diffusion of Cairo Arabic (CA) in Egypt as exemplified by its spread in Minya Governorate. Focus has been placed on how and why Minya Arabic (MA) speakers converge on CA as regards five linguistic variables: (q), (KaLLiM), (XaLLiF), (WaSSaL) and (stress). The respective CA and MA variants are exemplified as follows: [ʔaːl] and [gaːl] *'he said'*; [kallɪm] and [kɪllɪm]/[kallam] '*he spoke to'*; [xallɪf] and [xallaf] *'he begot'*; [jɪ-wɑsˤsˤɑl] and [jɪ-wɑsˤsˤɪl] *'he gives a lift to someone'*; and [madˈɾasa] and [ˈmadɾasa] *'school*'. The data on which the study is based is quantitative (recorded sociolinguistic interviews with 62 MA participants sampled according to age, gender, education and place of residence) and qualitative (an online perception questionnaire answered by 61 participants and detailing why MA speakers converge on CA along with the associations with both CA and MA in Minya).

The quantitative data was statistically analysed via mixed-effects logistic regression in R. Results show that age and gender are hardly significant or altogether non-significant, while education and place of residence are almost always significant. This refers to two positive correlations: the higher the educational level of speakers and the more time they have spent living in town, the higher the convergence on CA. Results of the perception questionnaire are in harmony with those statistically-obtained. They confirm the significance of education and place of residence in inducing convergence on CA in Minya and associate CA with education and urbaneness. They also suggest that MA speakers converge on CA not only because of the dialect prestige but also for economic reasons and that their linguistic behaviour is affected by their marital status and exposure to CA on TV.

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Author's Declaration

I declare that this PhD thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, university. All sources are acknowledged as *References*.

I declare that part of the results of my PhD thesis was presented in these conferences:

- The First Postgraduate Academic Researchers in Linguistics (PARLAY) Conference held at the University of York on 6th September 2013
- The First Forum for Arabic Linguistics Conference held at the University of Essex on 29th July 2015
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- The Second Forum for Arabic Linguistics Conference held at the University of York on 12th December 2016

I hereby give consent for my thesis, if accepted, to be made available for photocopying and for inter-library loan, and for the title and summary to be made available to outside organisations.

Chapter One: Introduction

1.1 Introduction

In this Introduction, there is a synopsis of the linguistic situation in Egyptian Arabic (henceforth, EA), showing linguistic variation as is clear in the large number of regional dialects and the multiglossic situation resulting from the coexistence of Fuṣḥā[1] and colloquial layers/levels. Then, the diffusion of Cairo Arabic (henceforth, CA) across Egypt is touched upon, followed by the aim of the study, Minya[2] Arabic (henceforth, MA) speakers' convergence on CA in Minya.

1.2 The Linguistic Situation in Egypt

1.2.1 Egyptian Arabic dialects

Thanks to many descriptive studies on EA varieties, there is a clear picture concerning the linguistic variation in Egypt (Abu Farag, 1960; Maṭar, 1967; Maṣlūḥ, 1968; Khalafallah, 1969; Doss, 1981; Behnstedt & Woidich, 1985; Nishio, 1994; De Jong, 1996a, 1996b, 1996c, 2000, 2003). In particular, Behnstedt & Woidich (1985) is a monumental atlas covering 814 speech communities in the Nile Delta, Nile Valley and the Oases of the Western Desert. In this work, EA dialects are divided into the following dialect areas/glosses (see Map 1.2) showing phonological, morphological and lexical features:

NILE DELTA

WESTERN DIALECTS (WD) include:

- WD 1: eastern Beheira, Kafr El Sheikh, parts of Gharbia
- WD 2: Rosetta, Baltim and Burullus

[1] The term Fuṣḥā, literally '*eloquence*', is preferred here to *Classical Arabic*, *Standard Arabic* and *Modern Standard Arabic*. Classical Arabic is a loose, ambiguous term (Youssef, 2013). Standard Arabic, which is the high variety in diglossic terms (Ferguson, 1959), may be understood in a way similar to Standard English or Standard French, while it is actually not (Ibrahim, 1986). Modern Standard Arabic is still an obscure term that conceals the fact that many Arabs codeswitch between their mother dialects ('āmmiyya/dārija) and Qura'nic verses and religious phrases (e.g. ḥasbuna Allāhu wa ni'ma al-wakīl '*Allah is Sufficient for us, and He is the Best Disposer of affairs*'). Although there is no consensus on what Fuṣḥā is, as is the case in Egypt (Parkinson, 1991), the term is believed to be the best umbrella term under which all types of non-colloquial features (i.e. old or modern; grammatical, lexical or stylistic) can be listed.

[2] المنيا may be transliterated as Minia, Minya, Menia, Menya, Al-Minia, Al-Minya, Al-Menia, Al-Menya, El-Minia, El-Minya, El-Menia, El-Menya, il-Minia, il-Minya, il-Menia or il-Menya. This transliteration problem is clear in Google Maps where Minya, Menia and Al-Menia are all used. In *Encyclopedia Britannica* (Britannica, 2014), Minya is used throughout. Furthermore, searching for Minya online gives the biggest number of results; therefore, Minya is adopted in this study.

***Map 1.1**: Map of Egypt*[3] (http://www.nationsonline.org/oneworld/map/egypt_map.htm)

- WD 3: western Menoufia
- WD 4: Beheira, western Menoufia, western Gharbia and parts of northern Giza

NORTHEASTERN DIALECTS (NED) include:

- NED 1: Dakahlia, eastern Kafr El Sheikh, parts of Gharbia
- NED 2: eastern Dakahlia and Manazala dialects

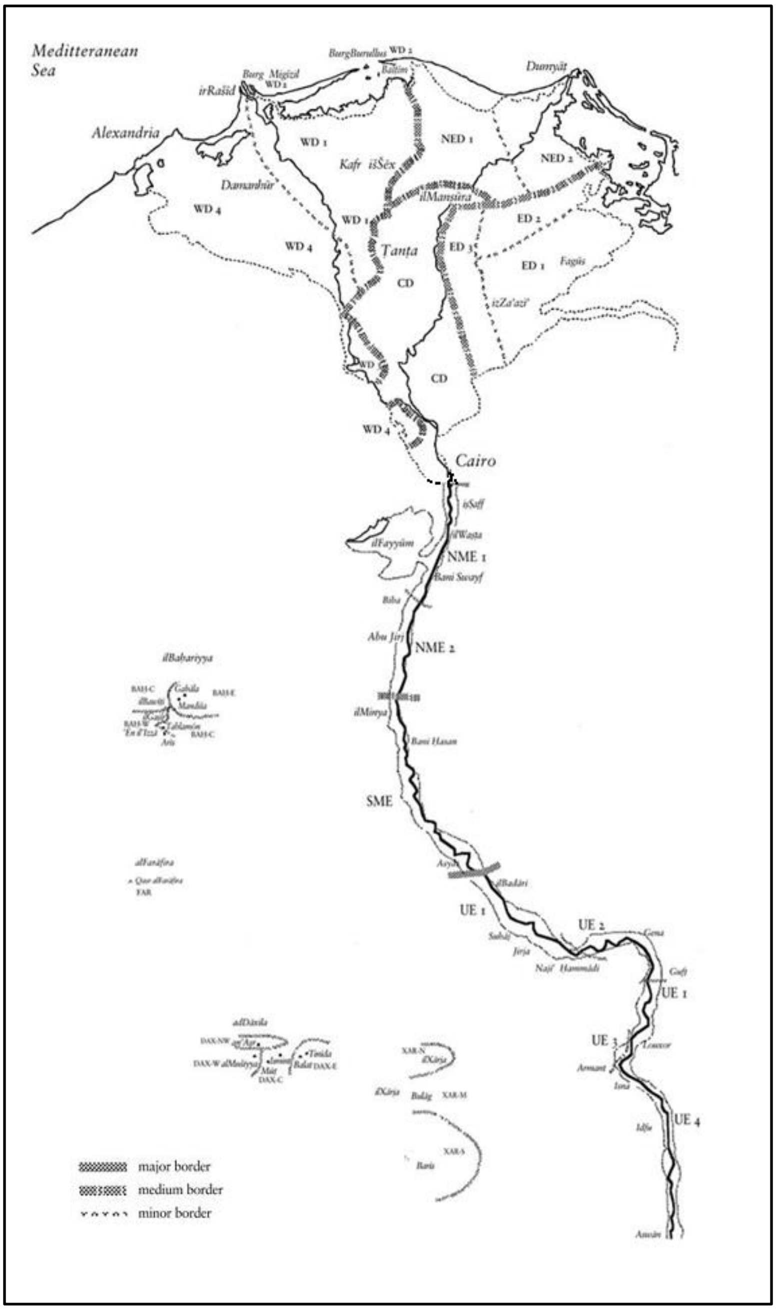
CENTRAL DIALECTS (CD) include:

- CD: Cairo, Menoufia, Gharbia and Qalyubia
- CED: eastern Qalyubia and parts of southern Sharqia

EASTERN DIALECTS (ED) include:

- ED 1: central, northern and eastern Sharqia
- ED 2: northern area of Sharqia and parts of Dakahlia
- ED 3: southwestern area of Sharqia, southern parts of Dakahlia and southeastern parts of the centre of the Delta

[3] Unless otherwise clarified, all maps are copied from Google Maps.



Map 1.2*: Dialect isoglosses in the Nile Delta, Nile Valley and the Western Desert adapted from Woidich (1996) and Wilmsen & Woidich (2006)*

NILE VALLEY

NORTHERN MIDDLE EGYPT (NME), which is also known as North Upper Egypt, includes:

- NME 1: southern Giza, northern Beni Suef and Faiyum
- **NME 2: southern Beni Suef and northern Minya**

SOUTHERN MIDDLE EGYPT (SME) includes

- **SME: southern Minya to Asyut**

UPPER EGYPT (UE) includes:

- UE 1: from Abu Tig in Asyut to Luxor
- UE 2: from Nag Hammadi to Qena
- UE 3: from West Bank Luxor to Esna
- UE 4: from Esna to Aswan

WESTERN DESERT (WD) dialects include:

- BAH: Bahariya Oasis with three varieties: east, central and west
- FAR: Farafra Oasis
- DAX: Dakhla Oasis
- XAR: Kharga Oasis

1.2.2 Multiglossia in Egypt

Diglossia (Ferguson, 1959) is always operating when dealing with the linguistic situation in any Arab country. In Egypt, this refers to the diglossic use of Fuşḩā and an Egyptian variety. Listening to/hearing the Qur'an recited, watching the news on TV or listening to/hearing it on the radio, attending Friday sermons and praying are practices that the majority of Egyptians are involved in and all are in Fuşḩā, the H form in diglossic terms. Everything else involves the use of dialect, the L form. Between the two poles are many layers or levels, and the exact number of these layers/levels cannot be decided exactly since all of them may fade into one another, depending on many factors. As Mejdell (2006, p. 3) believes, the main factor to move from one level to another is the degree of formality (p. 3).

Following the appearance of Ferguson's paper on diglossia (1959), other scholars offered other more realistic categorisations of the linguistic situation in the Arab world via proposing other intermediate levels[4] between the H and L forms[5] suggested by Ferguson. Blanc (1960) relied on an interdialectal conversation between 4 Arab teachers (2 Iraqis, a Syrian and a Palestinian). Based on this conversation, he reached a categorisation of 5 levels that go from the most formal to the most informal styles as follows: standard classical, modified classical, semi-literary or elevated colloquial, koineized colloquial and plain colloquial. In a similar way, Meiseles (1980) came up with a categorisation of 4

[4] In addition to the three categorisations clarified here, there are many others. Youssi (1983) suggested *triglossia*, with 3 levels; Hary (1996) coined the term *multiglossia*, including a continuum of an infinite number of levels; and both Kaye (1994) and Dichy (1994) suggested *pluriglossia*. The discussion of these terms and the levels they refer to is outside the scope of the present study. A thorough examination of them can be found in Mejdell (2006).
[5] Bassiouney (2006, p. 46) believes that these categorisations are not based on detailed descriptions or justifications and that real-life data shows that the situation is more complicated. A similar approach is also embraced by Mejdell (2006), who sees that even the recent attempts to propose models "tend to be flawed by lack of, or only minimal, empirical support, and turn out to be difficult to apply to natural data" (p.47).

levels: literary Arabic or standard Arabic, oral literary Arabic, educated spoken Arabic and plain vernacular. Badawi's (1972) classification is based on EA media. It has 5 levels that are similar to those proposed by Blanc (1960) and Meiseles (1980), but it is believed to mirror variation in Egyptian Arabic better for two reasons: it is based on EA data, and it is socially and stylistically stratified. These 5 levels go from the most to the least formal, as follows:

(1) Fuşḩā at-turāth '*the eloquent language of the heritage*' characterised by the proper use of grammatical rules (inflexions, voice, case, gender, number, person, etc.), archaic styles, and exclusively used by a very small number of Al-Azhar scholars in very formal contexts (e.g. in religious TV or radio programmes);

(2) Fuşḩā al-'aşr '*the eloquent language of the contemporary age*' characterised by adherence to grammatical rules, loanwords from different languages and easier styles, and used by highly-educated people in formal situations (e.g. reading the news on TV or the radio);

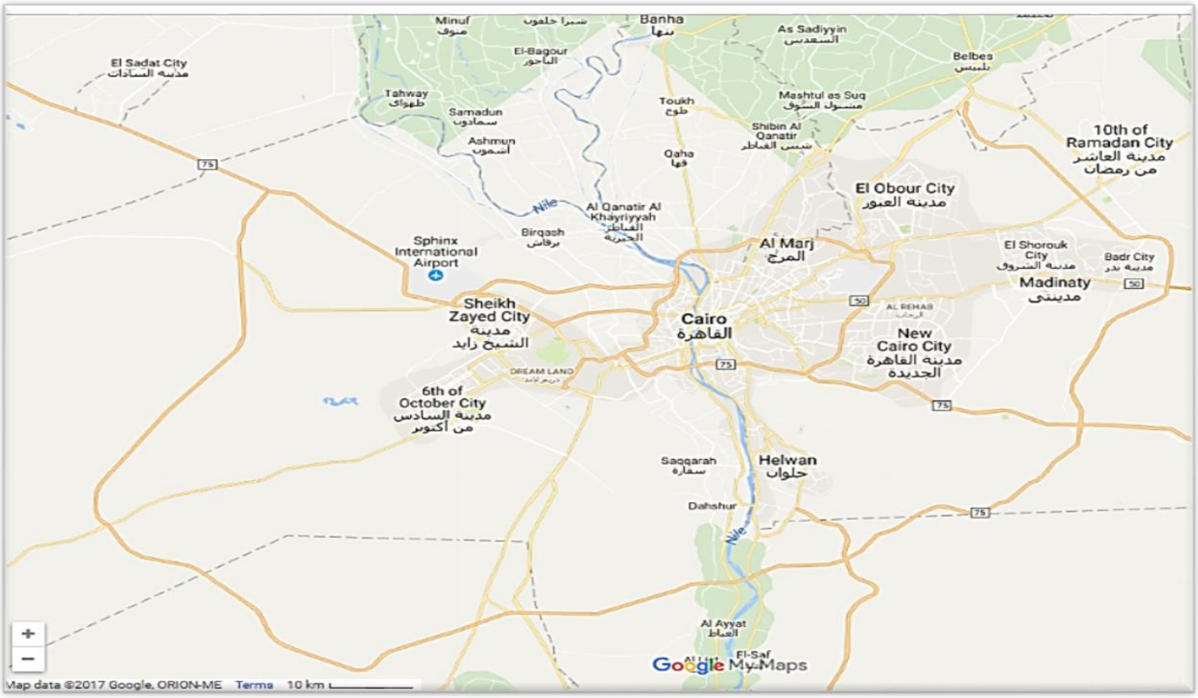
(3) 'āmiyyat al-muthaqafīn '*the colloquial of the cultured'* characterised by violating many of the Fuşḩā rules, especially regarding gender and number, switching to Fuşḩā when speaking about religious or literary topics, borrowing from other languages, and used by highly-educated people at universities, on TV and the radio;

(4) 'āmiyyat al-mutanawwirīn '*the colloquial of the educated*' characterised by departing from Fuşḩā except for quoting from the scripture or Arabic literature, and used by those with a level of basic education or higher in informal daily-life situations; and

(5) 'āmiyyat al-ummiyyīn '*the colloquial of the illiterate*' characterised by a limited amount of vocabulary, avoiding quoting from any Fuşḩā source and making mistakes if doing so, and used by illiterates.

1.3 CA

CA, which is described in many academic studies (Gairdner, 1925; Harrell, 1957; Gamal Eldin, 1967; Selim, 1967; Borselow, 1976; Abdel-Massih, Abdel-Malek, & Badawi, 1979; Woidich, 1997; Gadalla, 2000; Woidich, 2006b; Watson, 2007; Rosenbaum, 2011, to mention a few) and learning resources (Gairdner, 1917; Elder, 1927; Mitchell, 1956; Woidich & Heinen-Nasr, 2004; Louis, 2009; Al-Tonssi, Al-Sawi, & Massoud, 2013) is roughly at the 4th level described by Badawi (1972), and is used by educated Cairenes at home and in the media. Bassiouney (2006) supports this by making it clear that this level is “the everyday language that people educated to a basic level (but not university level) use with family and friends, and may occur on TV in a discussion of sport or fashion and other ‘non-intellectual’ topics” (p. 8) (underlining mine). Based on his observations as a native speaker of EA, the researcher agrees with Bassiouney’s clarification except in her reference to the level of education that she decides (i.e. only pre-university education), since all educated Cairenes use this 4th level regardless of their educational levels. This last point is also supported by Bassiouney (2006) where she says that “cultured and well-educated people also use it [the 4th level] when talking in a relaxed fashion about non-serious topics” (p. 8).



Map 1.3*: Map of Greater Cairo*

‘CA’ in the present study is a reference to Badawi’s 4th level, which has prestige inside and outside Egypt. Its prestige inside Egypt is a direct result of being the dialect of Cairo, the "political, administrative, economic, cultural and symbolic heart" (Mazraani, 1997, p. 50) and the “great trading, cultural, and religious center” of Egypt (Miller, 2005, p. 907). Furthermore, CA is the dialect used by politicians, celebrities and the intelligentsia, who are accorded higher social prestige than the rest of the Egyptians. Outside Egypt, CA prestige is due to its being widely understood and its cultural dominance. The dialect is linguistically intermediate between Eastern (Levantine and Peninsular) and Western

(North African) Arabic dialects (Al-Wer, 2006a), thus making it easy to understand for most Arabs. The dialect's cultural dominance is also attested in the media: the Arab film industry, TV serials, songs and plays are almost all in CA. In this way, CA is the RP in Egypt and Standard Egyptian Arabic abroad.

1.4 Diffusion of CA in Egypt

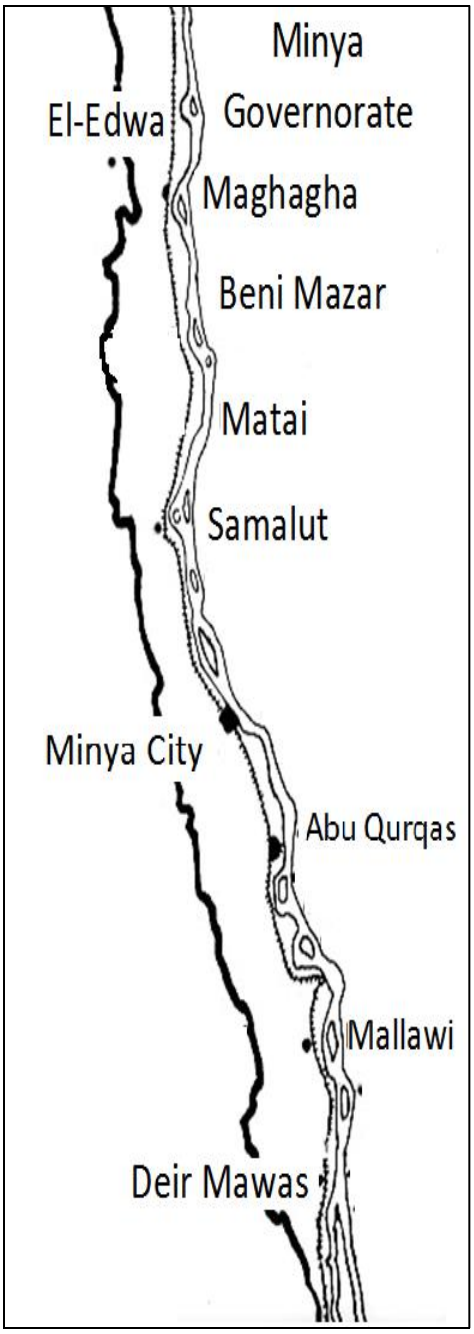
Geographical diffusion (Trudgill, 1983) involves the wave-like spreading of features from an economically- and culturally-dominant centre to nearby cities and towns that adopt the features before the rural areas in between (Kerswill, 2002b). The hypothesis tested in this thesis is that this is precisely what happens in Egypt regarding the diffusion of CA. The degrees of accommodating to CA positively (i.e. convergence on CA) differ from one speech community to another, and this is expected to rely on many factors, including gender, age, education, place of residence, identity, social network, contact with CA speakers, exposure to the media in CA, marital status, etc. It should be mentioned, then, that the studies mentioned above which document linguistic variation in Egypt are all dialectological; that is, they depended on collecting data from non-mobile old rural males (NORMs) (Trudgill & Chambers, 1998), probably with low educational levels or not educated at all. That way, these studies conceal the fact that CA has been diffusing and affecting speakers of other Egyptian varieties for a long time and in many places, especially those near Cairo.

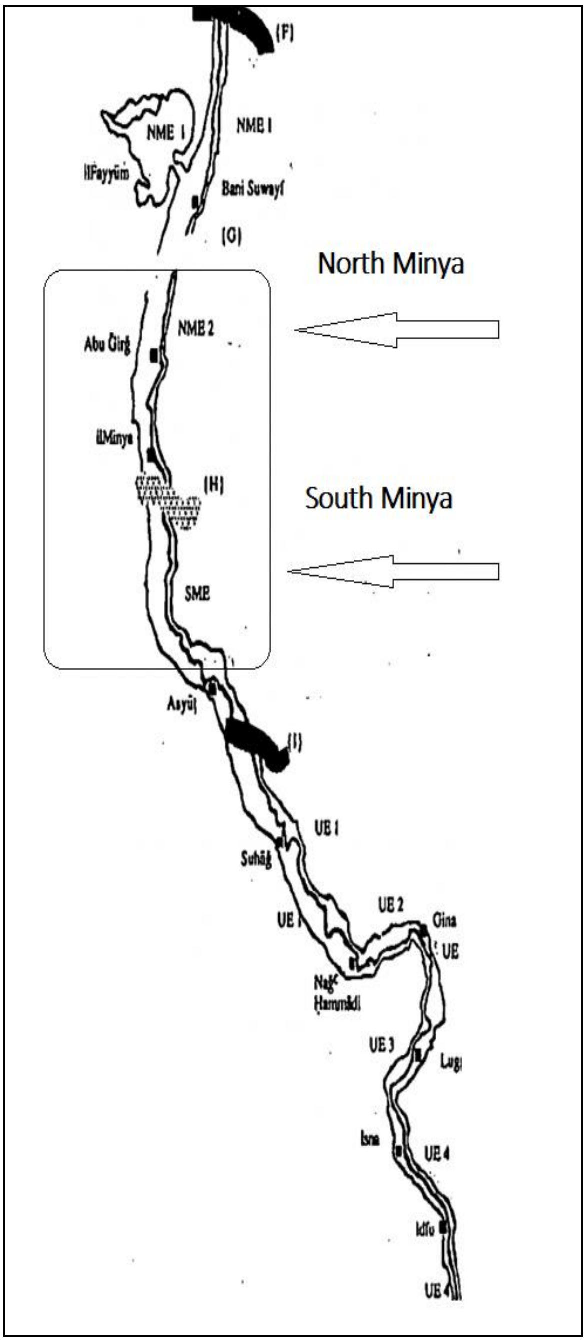
1.5 MA

MA is the regional dialect of Minya Governorate (see Map 1.1 and Map 1.3) extending from Maghagha (180 km south of Cairo) in the north to Deir Mawas (310 km south of Cairo) in the south. This huge area, 130 km along the River Nile, makes Minya one of the biggest governorates in Egypt, whose population is estimated at about 5 million people (about 5.9% of the total population) (CAPMAS, 2016). Linguistically, MA falls between two dialect isoglosses: NME 2 and SME. The part to the north of Minya City falls within NME 2, while the part south of Minya City falls within SME (see Map 1.4). MA is very rich with variations. It shares some similarities with the varieties to its north, including CA, and those to the south. In general, MA is closer to Upper Egyptian Arabic (henceforth, UEAr).

1.6 The Aim of the Study

The Speech accommodation theory (Giles, 1973) rests on the principle of speech attunement, positively or negatively. Positive accommodation (convergence) refers to solidarity with interlocutors,





***Map 1.4**: Map of Minya Governorate* (source: https://goo.gl/o08bb8)

***Map 1.5**: Borders of dialect isoglosses NME 2 and SME within Minya Governorate (adapted from (Woidich, 1996))*

while negative accommodation (divergence) shows alienation from interlocutors. Convergence involves increasing similarities between dialects and "homogenisation of the linguistic repertoire" (Hinskens, Auer & Kerswill, 2005, pp. 1-2), especially of salient features, features that people in a speech community are most familiar with (Trudgill, 1986, p. 11). The notion of salience adopted in this study is the "property of a linguistic item or feature that makes it in some way perceptually and cognitively prominent" (Kerswill and Williams, 2002, p. 81). According to Trudgill (1986), a linguistic item can be salient if it is stigmatised, undergoing linguistic change, has variants that are "phonetically radically different" or involved in the maintenance of a phonological contrast (p. 11). Added to these factors, Kerswill and Williams (2002) argue that extra-linguistic cognitive, pragmatic, interactional, social psychological, and sociodemographic factors are "ultimately the cause of salience" (p. 105) of a linguistic item/variable and "in the end directly motivate speakers to behave in a certain way, and are therefore central to the salience notion" (p. 106). This point raised by Kerswill and Williams reveals that these extra-linguistic factors must be considered when measuring the degree of salience of any variable. Trudgill believes that accommodation of one accent to another (or, more accurately, 'accommodation of speakers of one accent to those of another') may be delayed, inhibited or even prevented in the event of phonotactic constraints, a homonymic clash or if the variant accommodated to is associated with an excessively strong stereotype (1986, p.21).

In Minya, a lot of MA speakers converge on CA, and the present study is aimed at showing how this convergence on CA in Minya occurs and why. Convergence here refers to positive accommodation, whereby MA speakers try to attune their speech to make it more similar to CA by abandoning the salient MA features which may be perceived negatively by the speakers of other Egyptian varieties. This convergence may happen when MA speakers are in face-to-face contact with Cairene interlocutors, or in the absence of any Cairene. In this way, they either try to decrease the differences between themselves and their Cairene interlocutor/s or, when a CA speaker is not physically there, attempt to accommodate to the CA images or stereotypes (see details in section 7.8 regarding the identity projection model).

The data on which the present study is based is comprised of recorded interviews with 62 MA participants and the results of an online perception questionnaire answered by 61 MA speakers (see details in section 3.2.2). The participants were sampled according to four social factors: gender, age, educational level and place of residence. The effects of linguistic factors (style, and sounds preceding and following the target variants) on MA speakers' convergence on CA were also taken into account and statistically analysed. The linguistic variables focused on are consonantal (q); vocalic (KaLLiM), (XaLLiF) and (WaSSaL); and suprasegmental (stress). Trudgill's (1986) first two conditions regarding salience (i.e. stigmatisation and going through language change) apply to all these variables. The extra-linguistic factors suggested by Kerswill and Williams (2002) also operate; MA speakers are cognitively aware of the prestige of the CA variants and the stigma associated with the MA variants, and they are physiologically and pragmatically motivated to converge on the CA variants (see details in section 7.7).

1.7 Hypotheses and Research Questions

The hypotheses of the present study were based on the researcher's observations and the literature (see details in Chapter 4, 5 and 6). These hypotheses are as follows:

1. Convergence on CA is led by females;
2. Convergence on CA negatively correlates with age; i.e. the younger the speaker, the more he/she converges on CA;
3. Convergence on CA positively correlates with education; i.e. the higher the educational level of the speaker, the more he/she converges on CA;
4. Convergence on CA positively correlates with residence; i.e. the longer the time the speaker has spent in town, the more he/she converges on CA; and
5. CA is converged on in the careful style more than in the casual style.

The hypothesis that joins all these factors (i.e. gender, age, educational level, place of residence and style) is that convergence on CA in Minya is led by young, highly-educated females living in town (either born in town or rural migrants to any urban centre in Minya), especially in careful speech.

Neither the sounds preceding nor those following the target variants of the five variables investigated are hypothesised to have any effect on MA speakers' convergence on CA.

The research questions that the present study attempts to answer are as follows:

1. Has CA diffused in Minya?
2. Has CA affected MA?
3. Who in Minya is converging on CA, and who is diverging away from it in terms of gender, age,

education and place of residence?

4. Do any of the linguistic factors explored (style and the sounds preceding and following the target variants of the five variables investigated) trigger MA speakers' convergence on CA?
5. Why are MA speakers converging or diverging?
6. What are the associations that MA speakers have with CA and MA in general and the variants of the five linguistic variables investigated in the two dialects in particular?

1.8 An Important Terminological Note

Whenever *Minya* is used in the present study, it refers to the whole governorate. The capital of the governorate will be referred to as *Minya City*. *MA* also refers to the variety of Arabic used in the whole governorate, in the *NME 2* isogloss and the *SME* isogloss. *NMA* will be used to refer to the variety used in Minya City, its villages and the areas to its north (i.e. NME 2) and *SMA* to the variety used in the south of Minya City (i.e. SME). Terms in SMALL CAPITALS are defined in the glossary provided.

Chapter Two: The Locale and Dialects under Study

2.1 Introduction

As clarified in Chapter One, the aim of the present study is to explore the impact of CA on Egyptian dialects by looking closely at a case study: we will be investigating how CA is affecting MA, how MA speakers accommodate to the CA influence and how this happens and why. To highlight the dialects under study, a prior close look at the locale is needed. We will look at Cairo and Minya regarding geography, history, migrations that shaped the population structure, population growth, urbanisation, and education. Then, a profile of the two dialects under study is given, focusing on their development, features, social standing, contact, etc.

2.2 Cairo

Cairo is the capital of Egypt, the biggest Arab city, that has always been a "political, administrative, economic, cultural and symbolic heart" (Mazraani, 1997, p. 50) that affected other Arab capitals. It is the seat of government in Egypt and has most of its facilities; therefore, it is usually domestically called Maṣr, which is also the name of the country as a whole.

2.2.1 Cairo geography

Cairo is located in the North of Egypt, approximately 165 km south of the Mediterranean Sea, on the banks of the Nile. It is considered the southern gate to the Nile Delta (also Lower Egypt) in the north and the northern gate to Upper Egypt (Ṣaʻiːd) in the south. This unique location means that Cairo stands between two population masses, those of the north and those of the south, with different types of population structures that are reflected in language variation. Present-day Greater Cairo (see Map 1.3) is a composite made up of Cairo Governorate, most Giza Governorate quarters, and many other quarters in Qalyubia Governorate and Helwan Governorate.

2.2.2 Cairo history

Cairo was established in 969 under the name of Al-Manşuriyya (Abu-Lughod, 1971) derived from the root *N-S-R*, which refers to victory. The name lasted for four years (Glassé, 2003) before it was replaced with Al-Qāhira, derived from the root *Q-H-R*, which refers to subjugation. Gradually, Cairo absorbed the districts of Fustat, the previous capital established by ‘Amr Ibn Al-‘Āş immediately after the Muslim conquest of Egypt in 641. Fustat and Cairo were preceded by the Roman settlement Babylon and the Pharaonic settlement Memphis, which were situated near the southern point of the Nile Delta.

Since its foundation, Cairo has witnessed profound socio-political changes, including the change in the type of governments that were mostly non-Egyptian: Fatimids (969-1171), Ayyubids (1170-1250), Mamluks (1250-1517) and Ottomans (1517-1914). Under the Mamluks, Cairo was “a wondrous achievement, exceeding anything Europe had yet produced” (Alsayyad, 2011, p.122) and, in Ibn Khaldūn’s words, “the metropolis of the universe, the garden of the world, the anthill of the human species, the portico of Islam [and] the throne of royalty” (as cited in Byrne, 2004, p. 103). With the Ottoman rule coming to Egypt in 1517, Cairo entered into a period of decline that witnessed a weak economy and six famines between 1687 and 1731, in addition to a severe famine in 1784 that led to the death of 15% of Cairo’s population (Quataert, 2000). When Muhammad Ali (1769–1849) came to power in 1805, the modern Egyptian state, semi-independent of the Ottoman Empire, started and Cairo began to expand again as a modern metropolis.

From 1882 till 1952, Egypt was under British occupation, and Cairo witnessed massive socio-political ups and downs and was the focus of many political movements, including the 1919 Revolution and the 1952 coup d’état, which led to changing the government type from constitutional monarchy to a republic. Cairo started again to lead the Arab world up until the 1970s, but at the cost of economic development. Unplanned slums spread around Cairo when the state was busy with regional wars and conflicts, thus creating a social mosaic composed mainly of rural migrants from the north and south of Egypt. Furthermore, joining Cairo with nearby cities through a network of roads in the late 1980s and early 1990s but keeping these cities underdeveloped led to more migration or at least daily commuting to Cairo, which was behind the deterioration of public services.

Figure 2.1: *The Mosque of Muhammad Ali on 8 March 1862: Francis Bedford's photo while accompanying the Prince of Wales in his tour to the Middle East in the spring of 1862 (Gordon, 2013)*

2.2.3 Cairo the metropolis

After 1811, Cairo witnessed the increase of secondary schools and polytechnics, hospitals for different purposes, factories of many types and sending academic missions to France and Austria. As a result, a vast influx of villagers migrated to Cairo, which led to the establishment of many countryside-like districts on the margins of Cairo and the increase in the population that mounted to 240,000 in the 1820s (Lane, 1836). This migration-induced urbanisation coincided with the settlement of a large number of Ottoman, Greek, Italian, Sudanese and Levantine communities in Cairo.

Cairo was the first Arab city to have a newspaper in 1828, railways in 1854, a senate (the House of Representatives) in 1866, an opera house in 1869, a theatre in 1870, a football team (Al-Ahly Team) in 1907, a cinema in 1907, a modern university (Cairo University) in 1908, a foreign university (American University in Cairo) in 1919 and radio (1934). State-owned TV started in Cairo in 1959, and private TV stations were allowed as of 2000. There are currently more than 50 radio and TV stations based in Cairo. State-owned universities started to increase till the 2000s and then private as well as foreign universities were allowed in the late 1990s. Right now, there are more than 15 universities in Cairo alone. The metro system was launched in Cairo in 1988, expanded in the 1990s and 2000s, and it is currently the biggest in Africa.

2.2.4 Cairo population

Cairo has been a very densely-populated city since its foundation (Bairoch, 1988). The first official census started in Egypt in 1847. Figure 2.2 shows that the Cairene population grew very fast from 4.9 to 13.14 million people over 36 years, between 1960 and 1996. This increase cannot be attributed to natural growth alone; rather, it is a result of natural growth and urban as well as rural migration from other governorates. With this huge population, Cairo is now ranked the 14th largest megacity worldwide (United Nations, 2014)

2.2.5 Migration to Cairo

Migrations from Arabia started towards Egypt even earlier than the Muslim conquest in 641, increasing a great deal after the conquest and lasting for centuries. These coincided with other migrations from Asia Minor, Turkey, Greece, Armenia, Albania and Syria, especially while Egypt was an Ottoman state (up to 1924), in addition to the domestic migration from many Egyptian governorates (Miller, 2005). Since the first census in Egypt in 1847, the percentage of migrants to Cairo has been considerable, as shown in Figure 2.3. Until the 1950s, migration to Cairo was chiefly foreign (Zohry, 2002a), without any migrating community forming an ethnic or religious majority. From the 1950s, migration to Cairo has been largely domestic. During the 1950s and 1960s, migrants to Cairo mainly belonged to the elite from other Egyptian governorates, and they migrated to Cairo for study, but the majority of them settled in Cairo in middle-class neighbourhoods and contributed to the economy of the city. As of the 1970s, because of unemployment, deterioration in education and health services, and the soaring population growth in the early 1970s, migrants to Cairo have been chiefly unskilled laborers and vocational certificate holders who migrated to work in low-paying jobs (e.g. street vendors, coffee-shop waiters or construction workers) (Zohry, 2002b) and finally settled in slums at the margins of Greater Cairo.

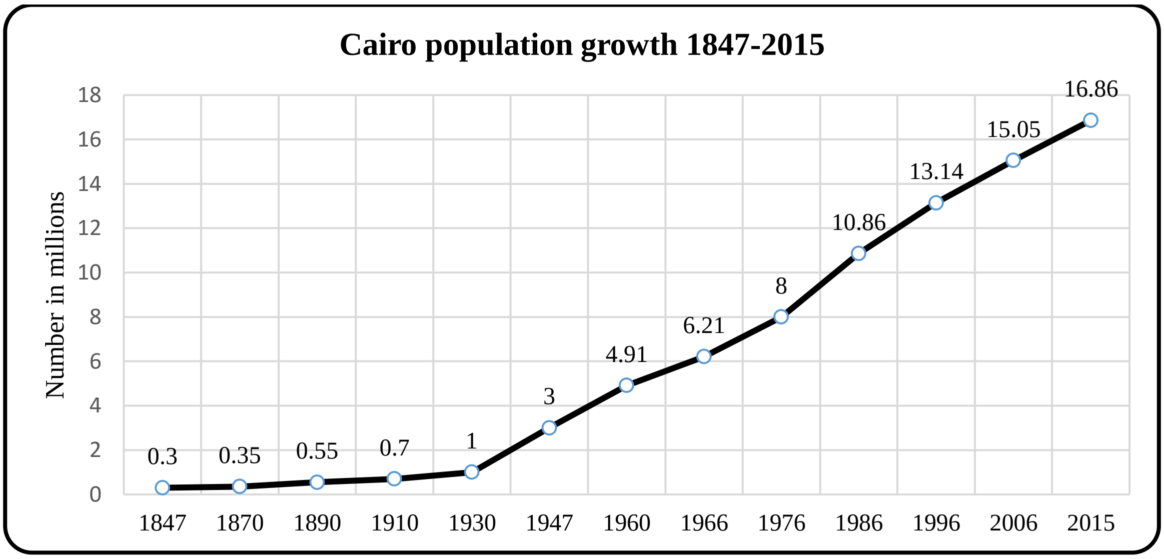


Figure 2.2: *Cairo population growth 1847-2015, calculated from Abu-Lughod (1971; 2004), Miller (2005) and CAPMAS (2015)*

It is obvious (see Figure 2.3) that the percentage of migrants in Cairo dropped after 1960 and remained so till 2006, the date of the last census. This is partly due to the political situation in Egypt: many international communities left Cairo after their businesses were nationalised, most Jews left Egypt in the aftermath of 1967 War, etc. In addition, because of the wars that lasted till 1973 and the allocation of a big part of the public budget to the war, development nearly stopped in Cairo and, therefore, domestic migration decreased. In the 1980s and 1990s, a large number of migrants left for the Gulf, Europe, Canada and Australia.

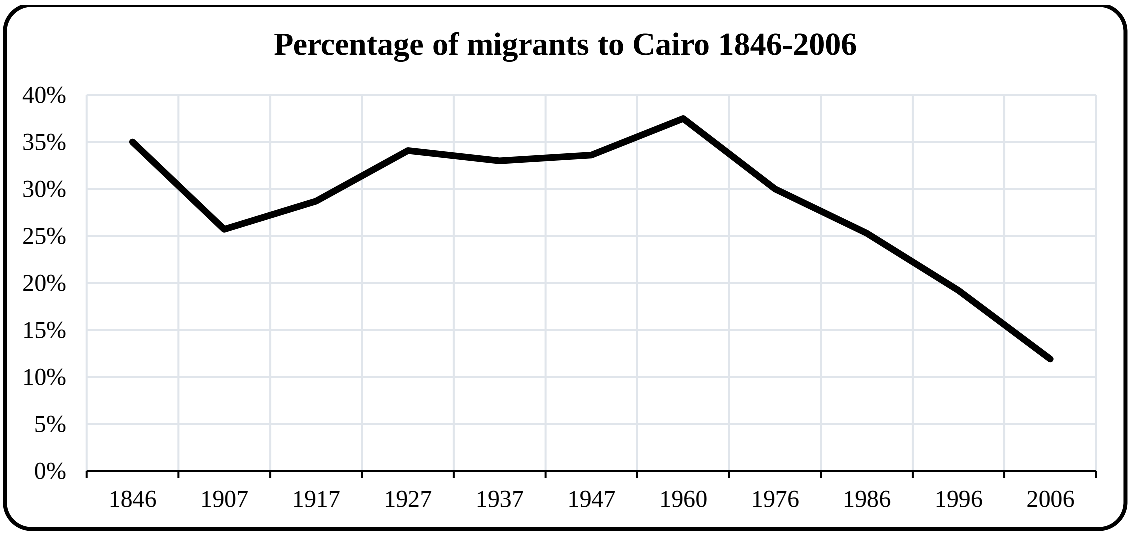


Figure 2.3: *Percentage of migrants to Cairo 1846-2006 as calculated from OUCC-CEDEJ (as cited in Miller, 2005) and CAPMAS (2015)*

2.3 CA

Present-day CA is the dialect spoken by people living in Cairo and the EA variety that is usually called standard Egyptian (colloquial) Arabic. In Owens' terms (2001), it is the native dialect of Egypt and a marker of being Egyptian outside Egypt. Because CA is related to Cairo, the city with the biggest effect on the Arab world in medieval as well as modern history, it has been considered the cultural hub and "semi-standard language across all Arab countries" (Bassiouney, 2015, p. 615). Since the 1930s, this effect of CA has been due to the impact of the mass production of Egyptian cinema, radio and TV that has been in wide circulation all over the Arab world (Versteegh, 2001; Woidich, 2006; Holes, 2005) and the huge number of Egyptian expatriates who started to migrate to the Gulf states during the 1970s and who usually adopt CA while abroad. As a result, CA has acquired prestige and wide acceptance that makes it the dialect converged on the most in inter-dialectal conversations among Arabs if an Egyptian is involved[6] (Mazraani, 1997). Because of this standing, CA has been documented and studied in detail in many grammar books, language learning resources, dictionaries, and academic work since the late 1880s, though the stages of the dialect's development are not yet fully explained (Versteegh, 2001).

2.3.1 Development of CA

As mentioned above, CA has been documented well since the 1880s, but the history of the dialect and how it developed from one stage to another is still incomplete. No claim is made here that the present study is an investigation of the development of CA; nonetheless, there follows an attempt to show, though briefly, that modern CA, starting from 1835, can be divided into four stages.

2.3.1.1 First stage 1830s-1850s: In the beginning was a plague

According to Woidich (1994), modern CA is a dialect mixture that developed due to inter-dialect contact between Cairenes and the huge number of villagers who migrated to Cairo following the 1835 plague[7]. The plague was so severe that it destroyed about a third of Cairo's population, who were rapidly replaced by villagers (Lane, 1836). 51 years earlier, in 1784, an appalling famine led to the death of about 15% of Cairo's population (Quataert, 2000), and those must have been poor people who were probably substituted with villagers as well. Therefore, it is not strange that in the first Egyptian census of 1847, migrants made up 35% of Cairo's total population (see Figure 2.3).

[6] This is also based on the researcher's personal experience. Even if the non-Egyptian speaker does not converge on CA, he/she is still able to understand CA easily. In my first conversation with the first Arab/Iraqi student I met at the University of York in June 2012, I stopped him about 15 times to ask about the meaning of some Iraqi Arabic words he used, while he did not stop me at all when I used CA. He also clarified the meaning of the words I asked about using CA equivalents. On radio, TV and cinema, non-Egyptian celebrities usually converge on CA (Bassiouney, 2015) and many Arab singers (Lebanese, Syrian, Tunisia, Algerian, Kuwaiti, etc.) mainly depend on CA in their performances.

[7] A full description of the plague's impact throughout Egypt is given in Kuhnke (1990).

It is very likely that a kind of dialect levelling occurred at this stage because migrants to Cairo came from different areas in Egypt and with diverse dialectal backgrounds. This levelling must have also been enhanced by the redistribution of Cairo's population that came as a result of some agrarian as well as industrial reforms introduced by Muhammad Ali (Raymond, 1993). It is also believed that the newcomers to Cairo did not like to converge on the Cairenes' dialect. This should be understood in the light of the social context in Cairo where the elite (rulers, military generals, top officials, etc.) were mostly non-Egyptian and did not speak Arabic at all, including Muhammad Ali himself. Furthermore, the CA of that time did not have an established prestige and was similar to many other Egyptian dialects, especially in the Nile Delta (Woidich, 1994; 1997). Unfortunately, there is hardly any direct evidence of this formative stage in the history of modern CA.

2.3.1.2 Second stage 1860s-1910s: CA at the crossroads

In 1863, Ismail (1830-1895), the grandson of Muhammad Ali, came to the throne as the Wāli (governor) of Egypt. He had a great ambition to modernise Egypt and, being educated in France, solidified the cultural connections between Egypt and France in particular. Having the dream to make Egypt part of Europe, he started to put many Western ideas into practice in Egypt by establishing Egypt Post in 1865, the House of Representatives in 1866 and the Royal Opera House in 1869 as part of celebrating the opening of the Suez Canal. Egyptian railways were launched in 1854, but trains were few and mostly used for freight. Under Ismail, the railways network was expanded to cover most cities in Egypt. By 1876, there were railways to connect Cairo to Alexandria, Aswan and Suez (Hughes, 1981). This helped in carrying newspapers, especially *Al-Ahram*[8] (est.

[8] Though *Al-Waqā'i'Al-Miṣriyya* newspaper (est. 1828) was older than *Al-Ahram*, the first did not have a big effect on the Egyptian society as it was a state-owned newspaper used as the official gazette, and printed in

1875), and concurrently many dialectal features[9] used by and for the elite to most Egyptian cities. In 1876, the Egyptian Khedivate was formed and headed by Ismail, whose title changed to the Khedive of Egypt and who started to behave as an independent ruler, away from the Ottoman domination. By that time, the Egyptian elite included prominent Egyptian figures such as ministers, MPs, top officials and Al-Azhar scholars. In addition to the Levantine and Ottoman communities, Greek, Armenian, French and Italian communities increased in Cairo, thereby creating a mosaic of languages that unquestionably had an impact on Egyptians' language. In particular, French was adopted by the aristocracy and upper middle classes as the prestigious language, which is clear from the huge number of French loanwords (Abdelbaki, 2013) and Italian loanwords that entered the CA lexicon. In 1882, Egypt was colonised by Britain and, hence, a British community was added to the mosaic of Cairo and English started to have an impact on CA as well. Nevertheless, the French impact was still the biggest till the early 20th century, especially at the diplomatic, legal and administrative levels (Gérard, 1996).

This stage in the development of CA witnessed a great interest in the dialect mainly for the purpose of teaching and learning it. Spitta (1880) was the first grammatical description of the dialect. It was followed by many books aimed at Arabic teaching and learning (Hassam, 1883; Vollers, 1890; Thimm, 1898; Nallino, 1900; Willmore, 1901, 1913; Dirr, 1904). Bilingual dictionaries also followed on (Cameron, 1892; Spiro, 1895). The main features of CA at that stage include:

1. Realisation of (q) as [ʔ] (Spitta, 1880; Cameron, 1892; Spiro, 1895; Vollers, 1895; Nallino, 1900; Willmore, 1901; Dirr, 1904; Willmore, 1913). However, beside [ʔ],

both Arabic and Turkish.

[9] It would be thought that the language used in *Al-Ahram* in the first few years after its launch was completely Fuṣḥā, probably based on the then type of language which was heavily affected by saj‘(rhymed prose) and ’iṭnāb (redundancy). This is partly true; however, the language used then had many dialectal features that represented the elite's daily language and loanwords from Ottoman Turkish, French and Italian.

[g] was also used by migrants from Upper Egypt and Delta (Cameron, 1892, p. xi; Dirr, 1904, pp. 20-21). The variability in CA at that stage is admitted by Spitta (1880), who described Egyptian Arabic, saying that it

> varies … and … changes continually in the mouth of the people. The natives themselves say that their language is *bi'ligtihād*, i. e. according to each one's personal fancy. If a man of the uneducated classes is asked what is the right expression to use in a certain case, he will frequently answer *kulloh ze ba'doh* 'it is all the same' (as cited in Dirr, 1904, p. v).

2. Realisation of (dʒ) as [g] (Spitta, 1880; Hassam, 1883; Cameron, 1898; Spiro, 1895; Thimm, 1898; Nallio, 1900; Willmore, 1901; Dirr, 1904; Willmore, 1913).
3. Absence of PAUSAL 'IMĀLA as clear in these examples: [sana] '*year*' (Spitta, 1880, p. 481); [saːʕah] '*watch*' (Hassam, 1883, p. 16); [xɪbɾa] '*experience*' (Cameron, 1892, p. 72); [xamsa] '*five*' and [xɑmɾɑ] '*wine*' (Spiro, 1895, p. 182); [qʊtˤtˤɑ] '*cat*' (Willmore, 1901, p. 84); [ɾiːħa] '*scent*' (Dirr, 1904, p. 160); and [ʕɑɾɑbɪjjɑ] '*car*' (Willmore, 1913, p. 35). This is in conflict with Blanc (1973), who believes that PAUSAL 'IMĀLA was a feature of CA till the early 20th century.
4. Stressing the penultimate syllable in words composed of CVC.CV.CV. Examples from Spitta (1880) include [gamˈbaha] '*beside her*' (p. 388) and [qalˈlaha] '*he told her*' (p. 462); from Vollers (1895) include [jɪkˈtɪbʊ] '*they write*' and [maħˈkama] '*court*' (p. 23); from Willmore (1901) include [kʊwajˈjɪsa] '*good* fem sing.' (p. 36) and [nɪʃˈnʊqʊ] '*we execute him*' (p. 36); and from Dirr (1904) include [madˈrasa] '*school*' (p. 134) and [qɑnˈtˤɑɾɑ] '*bridge'* (p. 142).
5. Using FORM II and V verbs (see Appendix 6) with [ɑ] if the final syllable contains a back consonant (emphatic or pharyngeal) as in [kɑsˤsˤɑɾ] '*he broke to pieces*'

(Spiro, 1895, p. 518) or with [ɪ] otherwise as in [kallɪm] '*he addressed*' (Willmore, 1901, p. 136);

6. Using the perfect and imperfect of FORM VII verbs to express the passive voice with the prefix [ʔɪn-] as in [ʔɪnkɑsˤɑɾ] '*it was broken*' (Vollers, 1895, p. 60) and [ʔɪnħabas] '*he was imprisoned*' (Willmore, 1901, p. 147) or [ʔɪt-] as in [ʔɪtkɑsˤɑɾ] '*it was broken*' (Spiro, 1895, p. 518).
7. Variability in the realisation of some wh-words as in [ʔeː] and [ʔeːʃ] '*what*' (Spiro, 1895, p. 25), [feːn] and [ʔeːn] '*where*' (Spiro, 1895, p. 469), and [ʔɪmta] and [ʔɪmtan] '*when*' (Spiro, 1895, p. 19).
8. Using many words that are currently considered rural or even vulgar, like [mɑɾɑ] that was used to refer to any woman (Spitta, 1880, p. 484; Cameron, 1892, p. 257; Spiro, 1895, p. 563; Nallino, 1900, p. 17; Willmore,1901, p. 93 & 1913, p. 4; and Dirr, 1904, p. 134). Currently, the word has a pejorative meaning. Other examples include using the suffix [ʊm] '*you* or *your*' affixed to nouns, verbs and pronouns with 2nd and 3rd person plurals as in [ʔɪntʊm] '*you* 2nd pl.' (Spitta, 1880, p. 483) and [ɾɑːħʊm] '*they started'* (Willmore, 1901, p. 36). The present-day usage is [ʊ]. Furthermore, [mʊɪja] '*water*' (Willmore, 1901, p. 21) is presently a stereotype probably all over Egypt. As for [sˤɑħn] '*plate*' and [wajjaːk] '*with you*' (Dirr, 1904, p. 157), they are still used in other Egyptian dialects as markers, but not in CA any more.
9. The usage of many loanwords from Ottoman Turkish, French, Italian ('Abd Al-Ghani, 2015; Abdelbaki, 2013)

It is noticeable here that, by the end of the second stage, the realisation of (q) as [ʔ] and (dʒ) as [g], stress placement in CVC.CV.CV words, and the absence of PAUSAL 'IMĀLA were already focused, as they are in present-day CA. The rural words, which are mostly pejorative now, were still present in CA as a result of rural migration. Because of the lack of any source on the first stage, it is very difficult to compare it to the second stage.

2.3.1.3 Third stage 1910s-1952: Emergent modern CA

Because of the British occupation of Egypt, English began to compete with French, especially at the military and administrative levels. After the British protectorate was declared in the country in 1914, Egypt no longer remained part of the Ottoman Empire, and the influence of Ottoman Turkish was going to diminish. British authorities continued their efforts aimed at weakening Fuṣḥā more and more (Shraybom-Shivtiel, 1999) by introducing English and French as the languages of instruction in 1888, but the 1919 Revolution changed the political situation in Egypt completely and gave Egyptians the chance to lead the country. Now, the elite in Egypt (politicians, business people, university professors, authors, etc.) was mostly Egyptian and had a desire to use Arabic alone at all levels. In 1925, many private radio stations started in Cairo, but none of them had a big impact because of the limited coverage and time for broadcasting (Majdy, 2014). In 1934, Cairo Radio, later renamed Egyptian Radio, was launched, and this was the first step leading to the prestige of CA in Egypt and the Arab world[10]. This was also enhanced by the appearance of Egyptian films with synchronised dialogue, the first of which was in 1932[11] (ʻIrāq, 2015). The launch of radio and cinema in the middle of that stage also coincided with the foundation of many newspapers and magazines[12] that must have had a massive impact on Egyptians' language. Listening to the radio or watching films from that stage reveals the fact that the language used in both media was very close to Fuṣḥā, and it

[10] Parts of the early recordings of these private stations and Cairo Radio are available at https://goo.gl/cpvJBb (Al-birnāmij, 9 June 2013)

[11] The film is *Awlād Adh-Dhawāt* '*The Well-Bred*' part of which is available at https://goo.gl/YMu7Wf (Film awlād ad-dhawāt, 1932). The second film to appear was *Al-Warda Al-Bayḍā'* [*The White Flower*], produced in 1933, is completely available at https://goo.gl/3nv7Ot.

[12] The list of these newspapers and magazines includes *Al-Laṭā'if Al-Muṣawarra Magazine* in 1915, *Al-Mar'a Al-Miṣriyya Magazine* in 1920, *Al-Muṣawwar Magazine* in 1924, *Rose Al-Yūsuf Magazine* in 1925, *Al-Wifāq Newspaper* in 1930, *Nūr Al-Islām Magazine* in 1930, *Al-Kawākib Magazine* in 1932, *Liwā' Al-Islām Magazine* in 1947, *Ar-Risāla Magazine* in 1933 and *Ṣabāḥ Al-Kheir Magazine* in 1951.

is believed here that this may have been due to the effect of those newspapers and magazines on their writers, who were frequent guests on the radio.

In addition to the focused features from the second stage ((q) as [ʔ], (dʒ) as [g], stress placement in CVC.CV.CV words and the absence of PAUSAL ʻIMĀLA) CA had the following features in the third stage:

1. Using the perfect and imperfect FORM VII to express the passive voice with the prefix [ʔɪt-] as in [ʔɪtˈkɑsˤɑɾ] ‘*it was broken*’;
2. Focusing of wh-words as in [ʔeːh] ‘*what*’, [feːn] ‘*where*’ and [ʔɪmta] ‘*when*’ (Gairdner, 1917, 1925);
3. Using the imperfect tense without the continuous or habitual aspect marker *bi-* as in [ʔaˈħɪbb] ‘*I like*’ and [ˈtɪfham] ‘*you* masc. sing. *understand*’ (Film al-warda al-bayḍā’, 1933). In the 1940s, however, the aspect marker *bi-* is found in the imperfect as in [bɪ-jataˈnafsʊ] ‘*they compete*’ (Film gharām wa intiqām, 1944);
4. Strong emphatics, though this should not be taken as perfectly representing Cairenes’ speech due to the very careful and sometimes hypercorrected style used in early recordings and films;
5. Using many words that are currently considered rural but fewer than in the second stage as in [mɪɣanˈnaːwi] ‘*singer*’ (Film al-warda al-bayḍā’,1933) and [ħadaˈfɪtni] ‘*she threw me with*’ (Film yaḥya al-ḥubb, 1938);
6. Using many French loanwords, especially in greetings as in [ʔʊɾɪvˈwɑːɾ] ‘*au revoir*’ and honorifics as in [mʊdmaˈzeːl] ‘*Mademoiselle*’ (Film al-warda al-bayḍā’, 1933);
7. Using very few Ottoman Turkish loanwords, especially honorifics as in [ʔaˈfandi] ‘*effendi*’ and [beːh] ‘*bey*’ (Film yaḥya al-ḥubb, 1938);
8. Increasing use of words that are currently considered Fuṣḥā, as in [ʔanˈtɪhɪz] ‘*I take the chance*’, [mamˈnuːn] ‘*happy* masc. sing’, [baˈdiːʕ] ‘*nice* masc. sing’ (Film al-

warda al-bayḍā’,1933), [ʔanˈfɪrɪd] ‘*I see someone alone*’ (Film yaḩya al-ḩubb, 1938), [ˈwaqaʕɪt] ‘*it* fem. sing. *happened*’ and [ʔataˈwassal] ‘*I beg*’ (Film gharām wa intiqām, 1944); and

9. The introduction of phrases that are currently considered Egyptian markers as in [ʔɪdˈdiːni ˈʕaʔlak] ‘*give me your wits*’ meaning ‘*do you believe it?*’ (Film gharām wa intiqām, 1944) and [ʕala nɑːɾ] ‘*on fire*’ meaning ‘*eager*’ (Film ‘afrīta hānim, 1949).

2.3.1.4 Fourth stage 1952-present: Fully-fledged modern CA

The 1952 coup d’état had another big impact on language in Egypt. The coup d’état leaders quickly abolished the constitutional monarchy and declared Egypt an Arab republic, thus asserting the importance of language and the fact that it was part of the new planned Egyptian identity. This was reflected in making education compulsory and accessible to everyone for free (Bassiouney, 2009), increasing the number of free schools and teaching Fuşḩā in foreign schools where the means of instruction was a foreign language. This coincided with launching some newspapers such as *Aj-Jumhuriyya* (*The Republic*) and radio stations such as *Şawţ Al-‘Arab* (*The Voice of the Arabs*) in 1953 to represent and spread the new pan-Arabism trend. In 1959, television was launched in Cairo under the name *At-Tilifizyoun Al-‘Arabiyy* ‘*The Arab TV*’, a name that aimed at promoting pan-Arabism and nationalism. Televised series, songs and programmes in CA enhanced regional prestige for CA. This probably contributed to the use of CA as a lingua franca for the whole Arab world since most Arab countries relied for years on Cairo’s mass radio and TV production. However, CA had a competitor at that stage. The measures adopted in Egypt revived Fuşḩā and made it compete with French, English and CA, which became a container where all of these were mixed.

After the 1970s, the focus on pan-Arabism weakened in the Arab world, especially after Egypt signed the 1979 Peace Treaty with Israel. Most Arab countries boycotted Egypt and, therefore, President Sadat upheld the ‘Egypt First’ policy (Suleiman, 2003). Politically, Egypt started to lose its leading role but CA kept its function as the most widely circulated dialect till the 1990s, when other Arab dialects began to acquire competing prestige. At the educational level, English started to acquire much greater prestige than any other foreign language, and many loanwords from French were replaced by English equivalents (French *caprice* and *Mademoiselle* by English *mood* and *Miss* respectively). At the same time, more foreign (recently labelled international) schools were established in Cairo and, because of the deteriorating educational system at state-owned schools, the middle class began to send their children to these schools. The same happened at the higher education level: foreign secondary-school graduates joined private and foreign universities, most of which are located in Cairo. The introduction of the Internet in Egypt in 1993 pushed the young generation to learn English at the cost of Fuṣḥā, the role of which has largely been replaced by CA.

The numerous descriptions of CA at this stage (Mitchell, 1956; Harrell, 1957; Gamal Eldin, 1967; Badawi, 1972; Abdel-Massih, Abdel-Malek & Badawi, 1979; Behnstedt & Woidich, 1985; Hinds & Badawi, 1986; Woidich, 2006a & 2006b; Watson, 2007) all tend to agree on the focused features of CA as it is spoken at present. These features, mainly phonological or syntactic, are identical to 3 and 4 in Section 2.3.1.2 and 1, 2, 3 and 4 in Section 2.3.1.3. CA at this fourth stage includes the following features:

1. Getting rid of rural words and replacing them with either urban ones or loanwords: for example, [ˈmɑɾɑ] ‘*woman*’ has been replaced by either [sɪtt] or the French word [maˈdaːm];

2. Less use of French loanwords: a few French words have remained in CA because they have been established and their pronunciation has generally been Arabised as in [tılıfızˈyoːn] ‘*télévision/TV*’, [sˤɑˈbuːn] ‘*savon/soap*’, [ˈdʒiːba] ‘*jupe/skirt*’ and [ʔɪˈʃɑɾb] ‘*echarpe/scarf*’;
3. The increasing use of English loanwords in the context of codeswitching between CA and English, especially in the technology and business domains: for instance, *computer*, *screen*, *mouse*, *internet*, *site*, *Miss*, *Mr* and *manager* are all used in CA and pronounced very similarly to their native English versions. A new feature in CA is to insert English verbs preceded and/or followed by affixes as in [**ha**.ʔaːd] ‘*I will add*’ and [**ha**.kʊnˈtakt.**ʊ**] ‘*I will contact him*’ where the first prefix [ha] is used as an aspectual future marker ‘*will*’ and the suffix [ʊ] is used as a 3rd masc. sing. object pronoun;
4. In contrast to 3 above, replacing long-established loanwords by Arabic equivalents as in replacing [ˈbʊʂtˤɑ] from English ‘*post*’ by [baˈɾiːd], [bʊˈliːsˤ] from English ‘*police*' by [ˈʃʊɾtˤɑ], [kʊnısˈtˤɑbl] from English ‘*constable*’ by [ʔaˈmiːn ˈʃʊɾtˤɑ], and [fabˈɾiːka] from Italian ‘*fabbrica*’ by [ˈmɑsˤnɑʕ] (‘Abd Al-Ghani, 2015);
5. Replacing expressions from the third stage by modern ones to express the same meaning, as in replacing [ˈħılmak mın ˈfɑdˤlɑk] ‘*bear with me, please*’ by [ˈʔʊsˤbʊɾ ʃɪˈwajja], [musˈtaxdım] ‘*employee*’ by [mʊˈwɑzˤzˤɑf], [dı ˈħaːga tˤɑlɑtˤˈtˤɑːʃɑɾ ˈxɑːlısˤ] (literally ‘*this is a very 13 thing*’) to mean ‘*elegant*’ by [ˈʔɑmɑɾ] (literally ‘*moon*’) and [bɑɾˈɾɑːni] ‘*false*’ by [mɑdˤˈɾuːb] (‘Abd Al-Ghani, 2015);
6. The semantic amelioration and pejoration of many words: for example, [xɑˈtˤiːɾ] ‘*dangerous*’, [ɾɑˈhiːb] ‘*horrible*’ and [dˤɑˈmɑːɾ] ‘*destruction*’ have been ameliorated to mean ‘*beautiful*’ or ‘*wonderful*’. On the other hand, [ˈbiːʔa] ‘*environment*’ has been pejorated to mean ‘*rubbish people*’; and

7. The spread of lexical innovations that are considered Egyptian markers in the Arab world: these are usually phrases that are first used on the radio, TV and cinema. They then go viral among Egyptians very quickly. Since nearly all radio, TV and cinema production is done in Cairo, CA is the main source of these innovations which are soon adopted in other Egyptian dialects. Examples of these innovations include [ˈmɪjja ˈmɪjja] (literally ‘*100 100*’) ‘*very good*’, [ˈʔɪrħam ˈʔʊmmɪ ʔɪl-ɣalˈbaːna] (literally ‘*have mercy on my weak mother*’) ‘*do something quickly*’ (Film ‘asal ’aswad, 2010), [ˈʔɪngɪz] (literally ‘*achieve*’) ‘*finish*’, [ˈgaːb ˈgaːz] (literally ‘*he brought gas*’) ‘*he became exhausted*’ and [ˈʔʊrɑni] (literally ‘*someone named Qurani*’) ‘*pimp*’ (Musalsal ẓarf ’aswad, 2014).

2.3.2 Which CA?

As mentioned before, because of mass migration to Cairo after the 1970s, many slums spread in Cairo to host the mostly undereducated, non-skilled migrants. With the passage of time, the second generation of these migrants acquired CA as their mother tongue but did so along with their innovations that express their identity. Since these slums are socially marginalised, the CA speech type used there is generally stigmatised. The stigmatisation is mainly due to lexical variations, voice quality and accompanying linguistic behaviour in these slums, rather than sound variations. Any reference to CA in the present study is a reference to the variety/level of CA roughly equal to Badwi’s (1972) ‘āmiyyat al mutanawwirīn ‘*the colloquial of the educated*’ (see details in section 1.2.2). This is due to the fact that the aim of the study is to explore how MA speakers converge on CA; and when this happens, the convergence is on this level of CA.

2.4 Minya

2.4.1 Minya geography

Minya Governorate is located in the middle of Egypt (see Map 1.1), extending for about 130 km along the River Nile. Minya City is the capital; it lies about 250 km to the south of Cairo. This area is administratively part of the North of Upper Egypt (also known as Middle Egypt). The governorate is composed of 10 boroughs (marākiz): El-Edwa, Maghagha, Beni Mazar, Matai, Samalut, Minya City, New Minya, Abu Qurqas, Mallawi and Deir Mawas (see Map1.4).

2.4.2 Minya history

Minya has a very long history. The ancient name of Minya is Oryx, which became the 16th province after the unification of Upper and Lower Egypt at the hands of Menes. Then, the name changed to Menat Khufu (Britannica, 2014), which means the nursing city of Khufu, the ruling Pharaoh reigning around 2550 BC and the founder of the Great Pyramid of Giza (Ring, Berney, & Watson, 1996). Minya was the ancestral home of the 4th dynasty in ancient Egypt (2575-2465 BC). During the Greco-Roman period, Minya served as an important religious centre. In the Byzantine period, the holy family (Jesus, Mary and Saint Joseph) is believed to have stayed in the Minya region (currently Samalut) during the flight to Egypt. In 328, Empress Helena, mother of Constantine the Great, commissioned the building of a monastery (now known as Deir al-Adhra) in the same place.

After the Muslim conquest of Egypt in 641, Minya received many migrations from Arabia, which is still clear from the names of hundreds of villages that carry names of Prophet Muhammad’s companions and family names that are very similar or even identical to big family names in Arabia. During the Abbasid Age (750-909 AD), Minya was named Munyat Ibn Al-Khaşīb (Ibn Al-Khaşīb’s wish) after the name of its ruler appointed by the Abbasid Caliph. In the Fatimid Age (909-1171), Minya expanded and had many schools and mosques built. The two main mosques built during the Fatimid Age and which still remain are Al-Lamaṭi and Al-‘Amrāwi Mosques. Migrations from Arabia did not stop. In 1150, a big migration coming from Quraysh and Kināna, two of the largest Hijāz tribes, came to settle in Minya (Al-Maqrīziyy, 1916) from where they headed to the western oases west of Minya and Sudan south of Egypt. In his visit to Minya, Ibn Baṭṭūṭa (d. 1369) admired its mosques and schools and described it as a city that "most emphatically excels all other cities in Upper Egypt" (Ibn Baṭṭūṭa, 2005, p. 53).

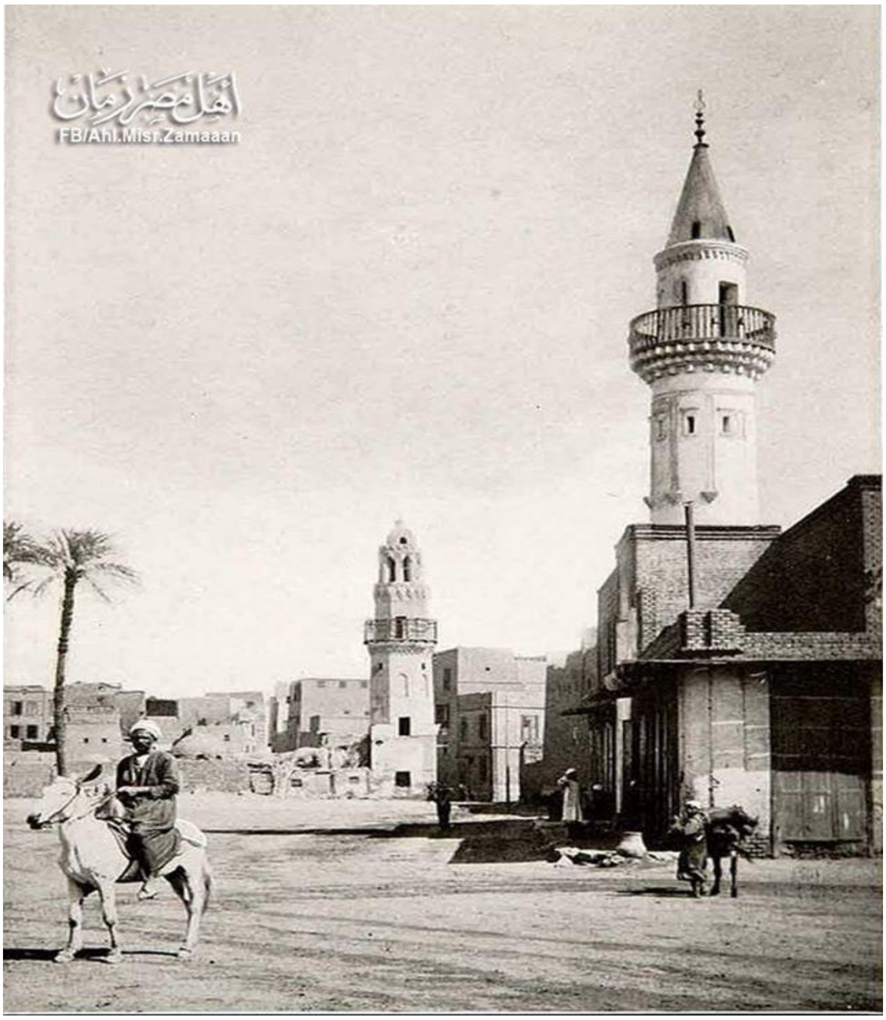


Figure 2.4*: A scene from Minya in 1922 (Ahl Miṣr zamān, 2014)*

Under Muhammad Ali and his successors, Minya was an important region economically because of its spacious agricultural lands that made it a centre of sugarcane and cotton plantations. This is why a railway was constructed between Minya and Cairo in 1867 (Hughes, 1981). Later, the many plantations in Minya led to the creation of an upper-middle class composed of Egyptian feudal beys and pashas, Greek and Armenian merchants and Ottoman bankers. This economic importance was enhanced by the establishment of a branch of the Ottoman Bank in Minya City in 1907 (History of the Ottoman Bank, 2015). After the 1952 coup d'état and the passing of nationalisation laws, the foreign capitalist community left the city, which started to suffer, like all Egyptian cities, during the wars Egypt had between 1956 and 1973.

2.4.3 Minya: Population and migration

Minya has always had a large population compared to other Upper Egyptian governorates. Figure 2.5 shows Minya's population growth between 1882 and 2015. It is clear that the population grew steadily up to 1976, when there was a big increase in the growth rate. Currently, Minya has the highest population in Upper Egypt and the 6th highest nationwide (CAPMAS, 2016).

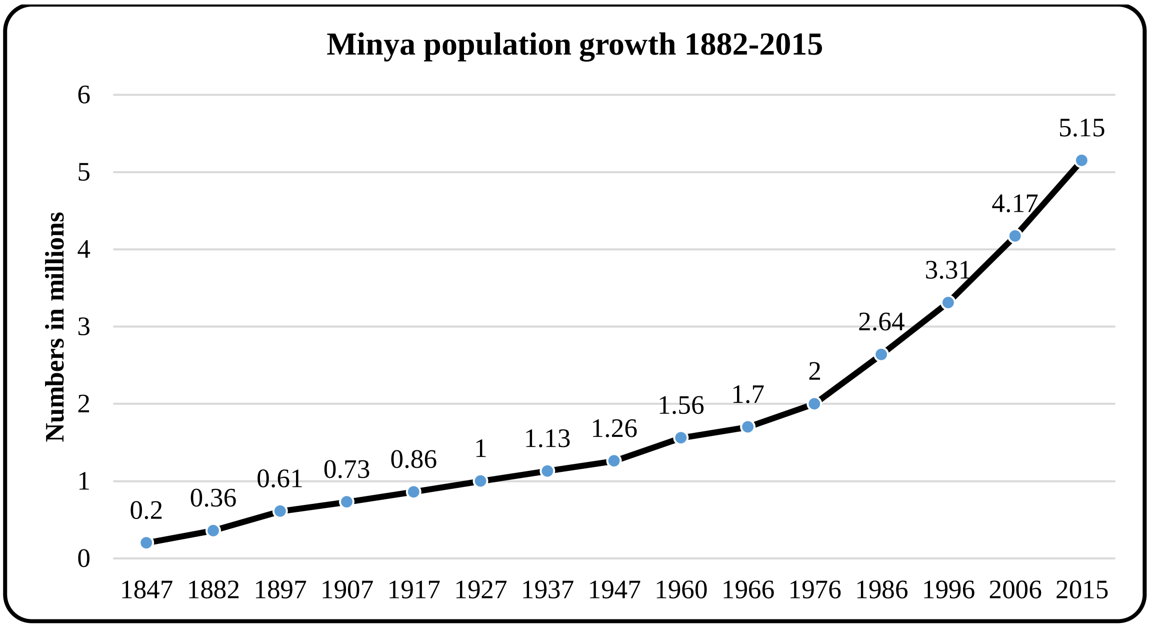


Figure 2.5*: Minya population growth 1882-2015 (CAPMAS, 1978; 1988; 2006; 2015 & Saleh, 2013)*

Although there are no official figures to confirm that Minya used to receive a large number of migrants from Upper Egypt, it is very likely that this was already happening a long time ago. This could be due to the fact that Minya extends along the River Nile for about 130 km and includes 439,000 acres (or 6.5%) of all of the country's arable lands

(Mahmoud, 2014), in contrast with the other Upper Egyptian governorates to the south. This is why Minya has been one of the biggest producers of wheat, cotton, sugarcane, potatoes and onions, the main crops in Egypt, for a long time. Starting from the 1980s, the introduction of agricultural technology caused the agricultural labour market to contract, thereby creating further unemployment. This also coincided with the expansion of villages on fertile lands, which decreased the size of cultivable lands. All of these factors contributed to pushing young Minya men in particular to migrate to big cities in Egypt, mainly Cairo, or to the Gulf States. These economic migrants generally work for some time outside Minya but come back again. Even if they settle outside Minya, they often invest their money in it, and this has been the main reason behind the high rate of countryside urbanisation in Minya over the past 40 years.

2.4.4 Urbanisation in Minya

Over the last 40 years, Minya has witnessed very considerable urbanisation. Earlier, most urban centres in Minya were limited and had very few services. Starting from the 1980s, there has been a gradual increase in the range of services. Electricity, telecommunications, hospitals and health units covered nearly all boroughs. As for transport, two desert highways were constructed to connect all the boroughs with Cairo and Upper Egypt, many roads were established or re-paved, and the number of commuter trains increased to connect urban centres and the countryside. In the financial sector, state-owned banks increased and private banks were introduced. In respect of media, A radio station (Shamāl Aṣ-Ṣa’īd Radio) was launched in 1983, a TV station (the 7th Channel, later renamed Upper Egypt Channel) started broadcasting in 1993, and access to the Internet was made possible at the end of the 1990s.

Furthermore, many villages in the vicinity of urban centres became attached to them, making them bigger, and New Minya Town was designated in 1986 to serve as an extension to Minya City. As a consequence of migration outside Minya, especially to the Gulf, the migrants either came back with fortunes or sent wealth to their relatives in Minya. The money was mostly spent on rebuilding houses, electrical devices (e.g. radio, cassette recorder, TV, fridge, washing machine, telephone, satellite dish, computer, mobile phone, etc.) and establishing supermarkets. This urbanised lifestyle made the countryside similar to town in many respects.

The number of primary and preparatory schools grew steadily across Minya Governorate from the 1970s to cover most urban centres and villages. Many secondary and technical schools were established in urban centres in the 1980s. In the 1990s, a large number of new private schools were set up, thus alleviating the problem of overcrowding in state schools. Minia University was founded in 1976 and, since then, has attracted the greatest number of students in Minya. Recently, private higher education institutes and universities have been granted permission to operate in Minya.

2.5. MA

MA is the traditional dialect in Minya Governorate. According to Behnstedt & Woidich (1985) and Woidich (1996), the dialect belongs to two linguistic regions (see Map 1.5): Northern Middle Egypt Arabic (henceforth, NMEA) and Southern Middle Egypt Arabic (henceforth, SMEA). As mentioned in Chapter One, the dialects of Middle Egypt comprising southern Giza, Beni Suef, Minya and Asyut are divided into three regional isoglosses: NME1, NME2 and SME. The part to the north of Minya City falls within NME2, while the part south of Minya City falls within SME.

2.5.1 Scarcity of studies on MA

Unfortunately, the disproportionate interest in studying and documenting CA has had a negative effect on the other Egyptian varieties. Towards the end of the 19^{th} century, European Arabists interested in language variation in Egypt dedicated their efforts to describing and analysing educated CA. While the titles of their works (Spitta, 1880; Hassam, 1883; Cameron, 1892; Vollers, 1895; Spiro, 1895; Nallino, 1900; Willmore, 1901 and 1913) reveal that they were focused on Egyptian Arabic, they often acknowledged that they analysed CA alone and omitted the variations outside Cairo. MA was no exception. The earliest description of MA is Maṣlūḥ (1968) which was followed by Doss (1981). Both works focus on MA alone. Behnstedt & Woidich (1985) is a monumental work on most Egyptian varieties. It devotes considerable space to MA, demonstrating that it shows a great deal of variation. The three works, which are regarded here as a real-time evidence, offer a very similar image of MA as an Upper-Egyptian variety. However, it should be clarified that these works are dialectological in nature, focusing on MA as it is spoken in the countryside. In particular, Doss mentions that she avoided collecting data from urban centres, especially Minya City, because she did not want to collect any data influenced by CA (1981, p. 2). This shows that the effect of CA on MA is not a new phenomenon.

2.5.2 Reconstructing the development of MA

Because of the lack of sources regarding how MA developed, it cannot be divided into stages as has been done with CA above. Therefore, an attempt is made here to explore how MA developed via reconstructing the current dialect. MA shares some similarities with Upper Egyptian dialects and others with CA. The similarities MA shares with Upper Egyptian dialects, which are also found in many Peninsular Arabic dialects, include:

1. The realisation of (q) as [g] as in [ˈɡɑmɑɾ] ‘*moon*’ (Doss, 1981; Behnstedt & Woidich, 1985, Map 8);
2. The realisation of (dʒ) as [dʒ] as in [ˈdʒabal] ‘*mountain*’ (Doss, 1981; Behnstedt & Woidich, 1985, Maps 10-14);
3. Stressing the first/heavy syllable in CVC.CV.CV words as in [ˈmadɾasa] ‘*school*’ (Doss, 1981; Behnstedt & Woidich, 1985, Map 59);

4. Using the second syllable in FORM II and V imperfect verbs and their derivatives with [ɪ] (only in the south of Minya) if the second syllable contains a back consonant (emphatic or pharyngeal), as in [jɪˈħɑdˤdˤɪɾ] '*he prepares*' and with [a] otherwise as in [jɪˈkallam] '*he speaks'* and [jɪˈʕallam] '*he teaches*';
5. Using the [-at] suffix with 3rd fem. sing. perfect verbs and their derivatives (only in the south of Minya) as in [ˈkatabat] '*she wrote*' (Behnstedt & Woidich, 1985, Map 286); and
6. Behnstedt & Woidich also mention PAUSAL 'IMĀLA (1985, Map 35) but it seems that this feature has disappeared from MA, though it is still a marker in some Upper Egyptian dialects in the UE1, 2, 3 and 4 regions.

The similarities MA shares with CA include:

1. Using the perfect and imperfect FORM VII to express the passive voice with the prefix [ʔɪt-] as in [ʔɪtˈxabaz] '*it was baked*'. In the Delta, it is [ʔɪn-] (Woidich, 1994);
2. Attaching the suffix [iː] to prepositions as in [gamˈbiːha] '*beside her*' (Woidich, 1994);
3. Using the second syllable in FORM II and V imperfect verbs and their derivatives with [ɑ] (only in the north of Minya) if the second syllable contains a back consonant (emphatic or pharyngeal) as in [jɪˈwɑsˤsˤɑl] '*he gives a lift*' and with [ɪ] if the first syllable contains such back consonant as in [jɪˈdˤɑllɪm] '*he turns lights off*'; and
4. Using the [-ɪt] suffix with 3rd fem. sing. perfect verbs (only in the north of Minya) as in [ˈʕamalɪt] '*she did*' (Behnstedt & Woidich, 1985, Map 286).

Furthermore, there are many villages with a majority of inhabitants from Bedouin origins in Minya, especially those villages along the Western Desert Highway starting from El-

Edwa Borough in the north to Deir Mawas Borough. In such villages, there are many Bedouin Arabic features, including:

1. Realisation of (q) as [ɡ] as in [ɡɪˈlamm] ‘*pen*’;
2. Realisation of (dʒ) as fricative [ʒ] as in [ʒɪˈmall] ‘*camel’*. The sedentary (urban and rural) MA variant is [dʒ];
3. Realisation of the diphthong (aʊ) used in nouns as [uː] as in [nuːm] ‘*sleep*’ and [tuːm] ‘*garlic*’. The sedentary MA variant is [oː];
4. Realisation of the monophthong (uː) at the end of 2nd and 3rd masc. pl. perfect and imperfect verbs as [aw] as in [ʔɪkˈtabaw] ‘*they wrote*’. The sedentary MA variant is [ʊ];
5. Gahawa syndrome is adding the short vowel [a] following a CVC syllable if the second consonant is [ʕ], [ħ], [h], [x] or [ɣ] (De Jong, 2003, p. 160; de Jong, 2006, p. 151; Rosenhouse, 2006, p. 262). This Bedouin feature is also operative in Bedouin MA (henceforth BMA) as in [bɑˈʕɑdˤhʊm] ‘*some of them*’, [bɑˈħɑɾɾ] ‘*sea*’, [ʒaˈhall] ‘*ignorance*’, [naˈxall] ‘*palm trees*’ and [baˈɣall] ‘*mule*’. Sedentary MA does not have this feature;
6. Using [aːt] as a fem. pl. suffix as in [ħɪlˈwaːt] ‘*beautiful*’. The sedentary MA variant is [iːn];
7. Doubling the last consonant in CV.CVC words, thus changing their syllable structure to CV.CVCC. For instance, sedentary [ˈħanak] ‘*mouth*’ and [ˈdˤɑɾɑb] ‘*he hit*’ change to [ħaˈnakk] and [dˤɑˈɾɑbb] respectively. As noticed here, the stress also shifts from the first to the last syllable. In sedentary MA, the structure is CV.CVC;
8. Using the 1st pl. subject pronoun to refer to the 1st sing. subject pronoun as in [haˈnabdaʔ] ‘*I will start*’;

9. Stressing the light syllable in CVC.CV.CVC constructions as in [ʔɪkˈtabaw] ‘*they* masc. *wrote*’ and [ʔɪkˈtaban] ‘*they* fem. *wrote*’;
10. Stressing the 1st syllable in CVC.CV.CV words as in [ˈmadrɪsa] ‘*school*’; and
11. Internal ‘IMĀLA as in [gɪˈlamm] ‘*pen*’ and [ˈmaktɪba] ‘*library*’ (see details in section 5.4.1).

Sedentary MA shares features 1 and 10 with BMA, and most of these features are also found in Upper Egyptian dialects, in UE 1, 2 and 3 regions (see Map 1.2) and Western Oases dialects (Woidich, 1997).

2.5.3 A development scenario proposed

In light of the previous observations, it can be claimed that MA started as a Bedouin dialect because of migrations from Arabia. It then developed into a sedentary one thanks to intermarriage, trade and urbanisation. It is worth mentioning here that these migrations from Arabia were mostly from different tribes and levelling in all likelihood occurred among the first generation in their garrison towns to facilitate understanding. In the second and subsequent generations, intermarriage increased between migrants and Minyāwis, especially after the latter converted to Islam; the migrants settled down in the then big urban centres in Minya or in villages that grew in size or developed into urban centres. This must have had a big impact on de-Bedouinising their language. The Arabian migrants who could not or did not prefer to mix with Minyāwis headed towards the desert to the west of Minya and formed villages that still carry the names of the forerunner Arabian migrants. Other migrations came from the west, especially from Libya and Tunisia, during the Fatimid Age and settled directly in the western desert of many governorates, including Minya[13]. These communities kept their extended families, sometimes preventing marriage between themselves and sedentary people, and kept their speech patterns for centuries. Because of

[13] A full account of Bedouins in Egypt can be found in Murray (1935).

the spread of urbanisation, education and media that swept through Minyāwis' lives step by step, BMA usage became very limited and can now be heard only in interactions between Bedouins. Outside of their neighbourhoods, they use sedentary MA.

2.5.4 Contact between MA and CA

Contact between Minya and Cairo has had many forms. First of all, it was economically-induced. Minya has always been a big producer of the main crops needed in the capital. After the establishment of Al-Azhar in 972, Minya students started to frequent Cairo for their studies. This was enhanced by the establishment of Cairene polytechnics in the middle of the 19th century and modern universities in the early 1900s until the 1950s (Cairo University in 1908 and Ain Shams University in 1950). With the start of Cairo Radio in 1934, Minyāwis started to be in daily contact with CA, which was boosted more and more by the start of television broadcasting from Cairo in 1959. With the establishment of Minia University in 1976, a sizeable number of Cairo University and Ain Shams University graduates were appointed as lecturers; they would speak CA with other staff members and students. Starting from the 1980s, a large number of Minya economic migrants migrated to Cairo to get better job opportunities, while maintaining very close ties with relatives and friends, thereby resulting in more face-to-face contact with CA. Furthermore, the boost in telecommunications, in addition to increasing the number of state-owned and private terrestrial and satellite radio and television stations broadcast from Cairo and in CA, made Minyāwis, like all Egyptians, very familiar with CA. Today, it is rare to find a Minyāwi who has not studied in Cairo, visited it, worked there for some time, or does not have a relative or a friend studying, working or living there. If not, they will in any case be familiar with CA through radio or TV.

2.6 Conclusion

In this chapter, light was shed on the locales of the present study, Cairo and Minya. The geography, history, urbanisation, population growth and development of both regions were given in brief. By doing so, it is hoped that the social history of the two regions was successfully related to the development of CA and MA. It is hoped that the main features in the two dialects in addition to the similarities and differences between them have been thereby clarified.

Chapter Three: Fieldwork & Methodology

3.1 Introduction

In this chapter, an attempt is made to show how the data on which the present study is based was collected and then analysed. It is, therefore, divided into two sections: data collection and data analysis. The first section highlights data collection principles, procedures and difficulties. It also touches upon the styles utilised to elicit the data, how the participants were sampled regarding the social factors, and the linguistic factors explored in the study. The second section is concerned with data analysis: how data was coded and transcribed, and how spreadsheets were prepared. Then, it shows how data was analysed statistically, detailing how and why the tool and toolkit were utilised to carry out the analysis.

3.2 Data Collection

The study is based on two types of data: recorded data and an online perception questionnaire. The recorded data is composed of approximately 40-minute interviews elicited from the sample (62 participants), yielding around 41 hours in total. The online questionnaire was distributed among some of the interviewed participants in addition to other MA participants who were not interviewed.

3.2.1. Recorded data

3.2.1.1 Principles

In data collection, the researcher depended on most principles of the sociolinguistic interview as laid down by Labov (1984), with minor modifications to suit the context where data was collected. The Labovian principles relied on are:

> (i) to obtain the full range of demographic data necessary for the analysis of sociolinguistic patterns; (ii) to obtain comparable responses to questions that define contrasting attitudes and experiences; (iii) to elicit narratives of personal experience, where community norms and styles of personal interaction are most plainly revealed,

> and where style is regularly shifted towards the vernacular; (iv) to stimulate group interaction among the people present, and so record conversation not addressed to the interviewer; (vi) to isolate from a range of topics those of greatest interest to the speaker, and allow him or her to lead in defining the topic of conversation; and (vii) to obtain specific information on linguistic structures through formal elicitation: reading texts and word lists (pp. 32-33).

3.2.1.2 Procedures

Data was collected by the researcher himself from all participants, with the exception of two participants whose data was collected by one of the researcher's linguist colleagues, the two participants' daughter. Generally, data collection went smoothly and was relatively easy as the researcher is a Minyāwi who was born, brought up and educated in Minya. In data collection, he relied on his wide social network that included his relatives, friends, students, colleagues and neighbours. He was greatly familiar with most participants' birthplaces, customs, linguistic backgrounds, social settings, educational levels, etc. Furthermore, asking participants to take part in the study was generally welcomed and was likely a response to the familiarity between the researcher and participants. Nevertheless, some old participants with low levels of education politely refused to be interviewed and this led to eliciting data from a small number of old participants (see details in section 3.2.4.2).

The first 5-minute period was designed to create an information profile for every participant: his/her birthplace, age, educational background, hobbies, interests and social network. Other questions included: how many friends or relatives each participant had in Cairo, how often he/she had been to Cairo and for how long, how much time he/she spent daily watching TV, whether it was Egyptian TV, and what dialect was used on TV, CA or another dialect. Those questions further provided the researcher with the topics that every participant was interested in, which greatly helped in opening long discussions and eliciting casual speech.

Following Daher (1999), this recorded 5-minute-long profile was not analysed; rather, it was considered a sort of ice-breaker and preparation for the recordings. The recorded interviews were intended to be run in an informal environment; therefore, tea, coffee, juice and/or biscuits were offered to participants. Since the interview included a picture questionnaire (see details in section 3.2.1.4.1) and a separate recorder with an external microphone was likely to cause some disturbance, a laptop was used in recording the interviews. The software used was Audacity (version 1.3.14) (2011). During the recording, the Audacity screen was minimised and the screen, after the picture questionnaire was over, dimmed to give a feeling that the laptop was off and there was no recording taking place.

3.2.1.3 Difficulties

The main difficulty encountered in data collection was cultural; asking single young females to attend an interview with a young male researcher (then 31 years old) can hardly be accepted in Minya. To solve this problem, the researcher preferred to collect data from single young females at university or workplaces rather than at home. He also asked every young female to bring a companion with her (a relative, friend or colleague) so that the participant did not feel embarrassed to sit alone with the researcher. It was difficult sometimes for a young female participant to find a companion to attend with her. In such a case, the researcher asked a female colleague assistant lecturer at Minia University to attend the interview either at the Minia University Campus or outside. The recordings started in January 2012, at a time when Egypt was not politically stable and many roads were blocked either by the police or protesters. This affected the speed of data collection. Furthermore, some participants wanted to know the real aim behind the recordings. If this had been disclosed frankly, it would definitely have affected the participants' speech; hence, the researcher, following Holes (1984; 1986), told them that the study was about customs and daily lives (i.e. a kind of anthropology).

Another difficulty that the researcher encountered was which dialect to use in the interviews. The researcher is originally an MA speaker who was born in El-Edwa Borough in the northernmost part in Minya (see Maps 1.4 and 1.5); that is, the NME 2 linguistic region (Woidich, 1996). His mother tongue/dialect is MA, but he acquired CA throughout the previous 13 years of his life before collecting the data, mainly because of being a student and then working as an Assistant Lecturer at Minia University. Since most participants were the researcher's workmates, old university classmates, students or neighbours whom he was familiar with for the previous 13 years of his life at the time when he started converging on CA, they expected him to use CA in the interviews. The researcher's few relatives who were interviewed expected him to use MA as they never normally heard him speaking CA because the researcher used to switch between the two dialects (MA with his relatives and CA at his workplace). Overall, the researcher did not observe any considerable change in the speech collected from the participants with whom he used CA; it was the same type of speech that he heard them using from the very day he started to know them, with very few, slight differences. As for the very few participants with whom the researcher was not familiar and to whom he was introduced by a mutual friend as a university lecturer, they probably expected him to use CA as well. To make sure that there was no difference between these latter participants' recorded and unrecorded speech, the researcher explained the real aims of the study to the mutual friend who, when asked by the researcher whether the participants' recorded speech was different from their non-monitored speech, emphasised that the difference was tiny.

3.2.1.4 Styles

To elicit data, the researcher depended on two speech styles "measured by the amount of attention paid to speech" (Labov, 1972, p. 208), from the careful style in which great attention is paid to speech, to the casual style that is close to the vernacular style in which someone "argues with his wife, scolds his children, or passes the time of day with his friends" (Labov, 1972, p. 85).

3.2.1.4.1 Careful style

Reading tests (minimal pairs, word lists or narratives) dominated Western variationist studies for a long time. But in the case of Arabic and for considerations related to the Minya speech community, reading tests as a way of eliciting careful speech were disregarded for many reasons. First of all, reading tests presuppose literacy in all speech communities, which is not valid. At the time of data collection, the illiteracy rate in Minya was 41.3% (CAPMAS, 2012)[14] and not all participants were literate. Depending on reading tests has been shown to be a misleading strategy (Milroy, 1987), as it assumes that there are no individual differences among participants in reading. Because Arabic is a diglossic language, reading tests would have also led participants to using Fuṣḥā (see Al-Wer, 2013), the high variety (H) that is highly codified, used in writing or in very formal situations (e.g. reading the news), formally learned and nobody's mother tongue (Ferguson, 1959), rather than dialect. For these reasons, a picture questionnaire was deemed to be a better choice for eliciting careful speech.

In the picture questionnaire, participants were asked to describe a picture on the laptop that contained a word featuring the target sound. For instance, to test participants' pronunciation of the (q) variable, a picture of a plate, pronounced in CA as [ˈtˤɑbɑʔ] and in MA as [ˈtˤɑbɑɡ], along with asking each participant 'what do you see in the picture?', motivated participants to produce the variant [ʔ] or [ɡ]. Where it was impossible to show a picture, participants were asked a closed question such as 'what do you do say when …'. Pictures were shown or questions were posed to participants in a way that did not focus on one feature at one time, so that they could not guess the variable being tested. For instance, a picture showing a *pen* to trigger the (q) variants [ˈʔalam] or [ˈɡalam] was followed by a picture of a *school* to generate the stress variants, in CA [madˈɾasa] and in MA [ˈmadrasa]. Some of the pictures were funny and made most participants laugh. The aim was to prepare the participant to forget that

[14] The last census before data collection was carried out in 2006.

they were being recorded and to overcome the Observer's Paradox (Labov, 1972). Most participants' attitudes were apparently in favour of the picture questionnaire; nonetheless, a few participants felt it was very formal and others felt it was ridiculous as was clear when a participant (who was excluded later) posed a question, referring to a pen, "Am I so young to ask me what this is?".

3.2.1.4.2 Casual style

The aim was to achieve a casual interview style in order to decrease the participants' attention towards their speech and get as much vernacular speech (Labov, 1984) as possible. Therefore, the interview depended on an open discussion of topics in which the participant was interested, which was established earlier during the first minutes of the recording when participants had been asked about their interests, hobbies, etc. Because the aim was to collect as much speech as possible, questions were very general (e.g. what are your favourite foods/TV programmes?), and the researcher tried to listen more than speak. If a participant's answers were short, the researcher tried to get the participant involved by persuading him/her to speak about personal experiences (Can you describe how you cook *Hawawshi*?[15]). If the answers were short, the researcher posed sub-questions (e.g. How much onion, garlic, spices and salt do you use in *Hawawshi*?, How long does it take in the oven? What should the oven temperature be?). This was all the time accompanied by jokes and amusing cultural references (e.g. references to popular Egyptian TV chefs) that made it more likely the participants would come to ignore the fact that they were being recorded. The majority of participants spoke clearly and for a long time. Some young females, however, did not speak enough or use a clear voice. As mentioned above, these young females were mostly asked to bring a female friend or relative with them and the researcher made good use of the friend's/relative's presence by

[15] *Hawawshi* is a famous Egyptian traditional dish. It is meat minced with spices, placed between two circular layers of pitta bread, then baked in the oven.

involving her in the discussion. This motivated the young female participants to comment on, correct or deny the companion's opinion.

In order to make the content of the interviews more comparable, thereby decreasing the number of lexical items that would be used as random effects in the statistical analysis (see section 3.3.4.2), the researcher posed similar questions to most participants, while taking into account their interests. These questions were mostly on education in Egypt, especially primary and university education, cooking, favourite foods, favourite TV programmes, favourite singers and childhood memories. Topics were selected carefully so that the use of Fuşḩā could be avoided; therefore, stretches of the interviews where religious, literary or political topics were discussed, which might have triggered Fuşḩā, were disregarded. Any codeswitching to Fuşḩā, though very limited, was not counted in the data. While females preferred to talk extensively about cooking and favourite TV series, males preferred to talk about education and childhood memories. Because the recordings were conducted between January and May 2012, a time when Egyptians were involved in politics before the presidential elections of 2012, most male participants tried to talk about politics, a topic that could prompt speaking in Fuşḩā, but the researcher tried to move them away from politics so that Fuşḩā could be avoided.

3.2.2 Online questionnaire

The questionnaire was designed and launched online, via Qualtrics, to collect data from as many participants as possible. 61 participants took part in the questionnaire, and some of them had already been interviewed. Participants were first asked some personal questions regarding their sex, age, education, place of residence, and the extent to which they were in contact with CA. Then, they were asked about their attitudes towards CA and MA in general and the linguistic differences between the two dialects, focusing on the linguistic variables investigated. This was aimed at getting familiar with MA speakers' social values in respect of the two dialects. Furthermore, to decide the degree of salience of each variable investigated, participants were required to judge how the linguistic features distinguishing MA from CA are likely to be abandoned in the event of convergence on CA. Participants were then required to decide which social factors and contexts (gender, age, education, place of residence, marriage, mobility, study, work place, study place, style, etc.) are responsible for convergence on CA in Minya and to mention the reasons that make them adopt it. The results of the questionnaire will be compared and contrasted to those of the recorded data.

3.2.3 Social factors under investigation

The social factors selected in this study include gender, age, education and place of residence. This is because these are the widely influential factors in language variation and change in Arabic-speaking speech communities.

3.2.3.1 Gender

Early sociolinguistic studies interpreted language differences between males and females as the consequence of biological sex. Towards the late 20th century, however, the orientation changed towards looking at these linguistic differences as caused by gender, which is determined by socio-cultural factors (Cheshire, 2002; Coates, 2006; Al-Wer, 2006b). Based on consistent evidence from numerous sociolinguistic studies of gender for more than 30 years, especially in Western speech communities, Labov (1990) formulated three principles regarding the linguistic differentiation of males and females:

Principle I: In stable sociolinguistic stratification, men use a higher frequency of nonstandard forms than women (p. 210).

Principle Ia: In change from above, women favour the incoming prestige forms more than men (p. 213).

Principle II: In change from below, women are most often the innovators (p. 215).

Labov’s conclusions, it seems, have robust findings to support them. Labov (1966) found out that males in New York used the non-standard variant of the (ing) variable (e.g. in words such as *running*, *giving* and *being*) more than females. Wolfram (1969) and Trudgill (1972) obtained the same results regarding the same variable in Detroit and Norwich respectively. Cheshire (1982) also found out that adolescent males in Reading used more non-standard grammatical features than adolescent females. Llamas (2001) demonstrated that young males in Teesside used more localised glottalised word-medial (p) than young females. Regarding language innovations led by females, Britain (1998) found that young female New Zealand speakers' pitch goes up at the end of clauses (high rising terminal intonation contour) three times more often than young males. Furthermore, Tagliamonte and D'Arcy (2004) showed that females in Toronto were leading the change behind the increasing usage of quotative *be like*.

Based on their results from Buenos Aires regarding the devoicing of /ʒ/ by participants across different age cohorts, Wolf and Jimenez (1979) concluded that "females are the leaders in the spreading of the change and they are almost a whole generation farther along" (p. 16). In a similar fashion, Al-Wer (2014) concluded that Arab women are "sometimes ahead of men by a whole generation" (p. 403). Al-Wer's conclusion is also based on vast evidence from many sociolinguistic studies conducted in Arabic-speaking speech communities. For instance, Abdel-Jawad (1981) found that females in Amman used the urban variant [ʔ] of the (q) variable more than males, when it was an innovation in Amman. Haeri (1991, 1994, 1997) also found that upper-class and upper-middle-class females in Cairo were leading weak palatalisation, while middle-middle and lower-middle-class females were leading strong palatalization of dental stops (/t/, /d/, /tˤ/, /dˤ/ and their geminates), especially following high front vowels or glides. Al-Wer (1991) studied four linguistic variables (namely, (q), (θ), (ð) and (dʒ)) in three Jordanian towns (Salt, Ajloun and Karak) and found that males were not participating in the linguistic differentiation going on at that time; therefore, males were excluded and the study was exclusively oriented towards the speech of females, who were leading the change towards using the supralocal variants. Ten years later, Al-Wer (as reported in Al-Wer, 2014) re-investigated Salt and found out that young males were starting to participate in the variation of three variables: (θ), (ð) and (dʒ). Furthermore, in his study of Qasīm Arabic (in the Najd region, Saudi Arabia) where the regional variant of (k) is affricated and pronounced as [t͡ʃ], Al-Rojaie (2013) found that females started to lead deaffrication and use the supralocal variant [k], while males were still generally sticking to the local affricate variant [t͡ʃ].

In light of the literature detailed above, it was hypothesised that MA females would lead the convergence of MA on CA; therefore, gender was chosen as a social factor in this study. Gender here refers to the sex of participants (males and females) and the social behaviour expected of them in Minya.

3.2.3.2 Age

If age affects the way people behave socially (clothes, marriage, worship, etc.) from one life stage to another, it surely influences the way they accomplish this through language and how they are perceived. Nevertheless, age has perhaps been "the least examined [factor] and the least understood in sociolinguistic terms" (Llamas, 2006, p. 69). Within Western variationist studies, adolescence is probably the most investigated stage. There are many robust results showing that this is the stage where language innovations start (Cheshire, 1982; Kerwill and Williams, 1997; Moore & Podesva, 2009). Because of this, it is described as "the life stage in which speakers push the envelope of variation" (Eckert, 1997, p. 164).

Findings have generally shown that age is a significant factor in language variation and change. In particular, they have shown that young people innovate new forms and adopt the incoming new ones far more than old people do (Al-Wer, 2006b), or lead change from below involving "the adoption and spread of linguistic forms characteristic of low-prestige social varieties" (Swann, Deumert, Lillis, & Mesthrie, 2004, p. 36). This may be because youngsters have less controlled social roles compared to adults with social roles as parents or workers. This is probably why adolescent speakers across different social classes in a large number of speech communities use more stigmatised variants than speakers of other ages (Cheshire, 2005). For instance, in his investigation of three linguistic variables, (ing), (ð) and negative concord in the Philadelphia Neighbourhood Study, Labov (2001) found that 16-year-olds had a higher frequency of the stigmatised variants that are inversely related to age increase.

The social meaning of age may be void if not correlated with other social factors like gender, social class or education. This is because when someone ages, his/her social roles change. For instance, a 25-year-old married female in Egypt usually has more responsibilities than a single male of her age, a 20-year-old university student has a wider social network than an apprentice baker of his/her age, etc. Therefore, many studies report results obtained through the interaction between age and another/other social factor/s. As shown above (see section 3.2.5.1), Cheshire (1982), Britain (1998) and Llamas (2001) related their results regarding age to gender and Haeri (1991, 1994, 1997) linked hers with social class.

Age can be measured in years or life stages. Some variationists prefer to measure it in years (hence, it is statistically a continuous factor/predictor) as this is easier to handle in statistical analysis (see section 3.3.4), but measuring age in years may blur its social function. Others prefer to measure age in terms of life stages, and this certainly depends on life experiences that differ widely among societies. Eckert (1997) proposed a 3-way classification of life stages involving childhood, adolescence and adulthood. It is believed here that such classification could disguise many important life changes in the adulthood stage. If adulthood starts at 18 or 21 and a person lives till he/she is 80, this means that about 60 years of his/her life will be measured as belonging to one stage (i.e. adulthood) though it is full of different social roles (e.g. student, apprentice, husband or wife, regular employee and retiree). Labov (2001) proposed a better classification to reflect his participants' "acquisition and use of linguistic norms and … ability to put them into practice" (p. 101). He divided participants' ages in the Philadelphia Neighbourhood Study into seven life stages, as follows:

> (**1**) alignment with the pre-adolescent peer group (8-9), (**2**) membership of the pre-adolescent peer group (10-12); (**3**) involvement in heterosexual relations and the adolescent group (13-16); (**4**) completion of secondary schooling and orientation to the wider world of work and/or college (17-19); (**5**) the beginning of regular employment and family life (20-29); (**6**) full engagement in the workforce and family responsibilities (30-59); and (**7**) retirement (60s) (p. 101).

This division may be suitable for American society but cannot be necessarily imposed on any other society with different social values and practices.

Age has been chosen as a social factor in this study because of its hypothesised significance. It was hypothesised that the young generation in Minya would lead the convergence on CA. Age will be analysed in this study as a categorical factor involving three levels (age groups): young (18-30), middle-aged (31-50) and old (over 50). In the Minya society, and probably Egyptian society at large, the first stage usually involves study, looking for a job opportunity, and the beginning of marriage; the second stage generally entails increasing family responsibilities, and work as a subordinate; and the third stage tends to involve extended-family responsibilities, work at senior levels, retirement and post-retirement. The aim behind this division is to make sure that dividing age into life stages has an effect on MA speakers in terms of their convergence on CA.

3.2.3.3 Education and place of residence

Education in the Arab world is a complex factor, notably intermingling with socio-economic class. Because of this, it seems, most variationist studies conducted on Arabic-speaking speech communities did not take social class into account as a social factor, replacing it with level of education. Even when some studies took social class into consideration, this was done through an index involving education. For example, in her study of Cairo, Haeri (1991, 1994, 1996) utilised a social-class index composed of four indicators: (1) parents' occupation, (2) speaker's education, (3) speaker's neighbourhood, and (4) speaker's occupation. Since it is well known, in the context of Cairo and other urban centres across Egypt, that a person's and his/her parents' occupations are mainly based on the educational level obtained, and that a person's place of residence (neighbourhood) also relies on his/her occupation, social class is ultimately dependent on education. Hence, Haeri's social-class index can be re-arranged as follows: *parents' education* → parents' occupation → parents' and speaker's neighbourhood → *speaker's education* → (speaker's occupation → speaker's neighbourhood). The indicators between brackets could be disregarded if the participant is still a student or does not have a job. It is clear from this example that social mobility and, accordingly, linguistic variation in Cairo largely rests on education. If this is the case in Cairo as an old urban centre in the Arab world, education would have a bigger impact on social mobility in modern Arab urban centres, as is the case in the Gulf states.

Education could also be a "proxy" factor (Al-Wer, 2002a, p. 42) acting on behalf of other factors, especially place of residence and social network, in the Arab World (Al-Tamimi, 2001).This is due to the fact that

> in Arabic-speaking communities, it is not level of education per se which correlates with linguistic usage, rather that level of education is actually an indicator of the nature and extent of the speakers' social contacts. It just so happens, that, in the Arab World, access to education, especially at the higher level, and often even beyond primary schooling, involves significant alterations to individuals' socialisation patterns. It involves leaving one's home town, changes in familial links, expansion in social contacts, interaction with speakers of other dialects, exposure to different social values, shifting of one's loyalties and attachments to various social groups, changes in priorities and ambitions, etc. (Al-Wer, 2002a, p. 42).

In other words, access to post-basic education generally involves either commuting or changing place of residence completely, and this entails distorting the speaker's closely-knit social networks, especially for those living in conservative societies (e.g. the countryside) with multiplex ties. If there is no doubt regarding the impact of access to higher education on language variation and/or change, it should also be asserted that this holds true for other types of post-basic education. For example, Ornaghi (2010) investigated the diffusion of CA [g] and [ʔ] as variants of (ʤ) and (q) respectively to three villages in the vicinity of Zagazig, the capital of Sharqia Governorate (Egypt). Since Zagazig Arabic shares [g] and [ʔ] with CA, there is no competition in this case. Ornaghi found a high, though not complete, diffusion of the prestigious variants [g] and [ʔ] in favour of the localised/rural [ʤ] and [g] in the three villages examined as a result of mobility, education, patterns of social networks and exposure to the media. He strongly interpreted mobility ('spatial' in this study) and the uniplex patterns of social network as a result of education, even among those who had a pre-university educational level.

A striking example of the importance of education in bringing about linguistic variation is Badawi (1972), who divided Egyptian Arabic into five levels largely as a function of education (see details in section 1.2.2).

The spread of education in the Arab world accelerated with increasing urbanisation. This led to wide exposure to Fuşḩā, the diffusion of the Fuşḩā prestige and, hence, the deepening of the diglossic division. Accordingly, the competition between the prestige of national standard dialects and that of Fuşḩā escalated. This competition is still daily amplified by media, a considerable part of which is run in Fuşḩā or at least in Educated Spoken Arabic (henceforth ESA). However, the robust findings of many Arabic studies show that the higher the educational level of the speaker, the more innovative or adopting of features from the national standard dialects he/she is likely to be, even if the non-prestigious features are closer to Fuşḩā. For example, Al-Ahdal's results show that his *tribal* Mecca speakers adopted the *non-tribal* variants [s], [ɾ] and [ðˤ] of the (θ), (ɾˤ) and (dˤ) variables respectively in favour of the Fuşḩā variants [θ], [ɾˤ] and [dˤ] respectively as well (1988). *Tribal* in Al-Ahdal's study refers to the variety used by rural migrants to Mecca from different areas in Saudi Arabia, and *non-tribal* refers to that variety used by Muslim immigrants who settled in Mecca and who form the majority of urbanites there. Uniformly, many studies showed that highly-educated (especially, young) speakers in Jordan use the urban supralocal variant [t] of the dental (θ) variable rather than the traditional localised [θ] variant, though the latter is the same in Fuşḩā (Al-Khatib, 1988; Abdel-Jawad and Awwad, 1989; Al-Wer, 1991; Al-Tamimi, 2001; El Salman, 2003, as reported in Al-Wer, 2014). Very similar results are also reported by Jassem (1987) on (q), (k), (dʒ), (dˤ), (ðˤ), (ð), (θ) and suffixal (-k) in Damascus and by Jabeur (1987) on monophthongisation in Tunis. The change led by educated speakers here is towards the standard dialects, which are usually those of capitals in the Arab World, because Fuşḩā is "simply irrelevant in the processes of variation and change in vernacular Arabic" (Al-Wer, 2014, p. 403). This also proves that language variation and change in Arabic depends not on the variety used; rather, it depends on the status of the people using the variety.

Education is treated in this study as an umbrella factor. It incorporates the educational level obtained by the participants and also serves as an indicator of their social class to a great extent and how dense or loose their social network is. It is worth mentioning here that any occurrence of codeswitching from dialect to Fuşḩā has been excluded in the analysis, since the aim is not to compare or contrast the two varieties.

3.2.4 Sampling

3.2.4.1 Sampling according to geographical distribution

Data was collected from 62 participants coming from the ten boroughs (marākiz) forming Minya Governorate: El-Idwa, Maghagha, Beni Mazar, Matai, Samalut, Minya City, New Minya, Abu Qurqas, Mallawi and Deir Mawas. As Minya City has many villages attached to it administratively, these villages were classified as belonging to one borough, thereby increasing the number of boroughs to 11. Participants are not equally distributed regarding each borough. This is due to the big differences between these boroughs in size and population (see Figure 3.1). It is also due to the researcher's contact circles at the time of data collection, most of which were in Minya City, its villages and New Minya, the extension of Minya City.

As is clear in Table 3.1, participants from North Minya constitute 74.19% and those from the South constitute no more than 25.81%. This big difference is representative of the difference between the population size in North and South Minya, with the North forming 64.69% and the South 35.31% of the total population. All participants are sedentary (villagers, urbanites or rural migrants). Only two participants (one villager and the other a rural migrant) come from a Bedouin background. Since the aim of the study is to focus only on sedentary MA, the researcher thought of excluding these two participants. But after analysing their speech, it was found out that their speech has hardly any Bedouin features (see section 2.5.2) and, therefore, they were kept in.

3.2.4.2 Sampling according to social factors (gender, age, education and place of residence)

The sample is distributed fairly equally between males and females, but there is an imbalance in age and education. As clarified in Table 3.2, the sample is comprised of 33 males and 29 females. Of these, 34 participants are young (between 18 and 30 years of age), 18 are middle-aged (between 31 and 50), and 10 are old (50 and over). Of these, 14 are postgraduate students or graduates, 32 university students or graduates, and 16 have a secondary-school level of education or below. In terms of place of residence, 27 participants are urbanites, 7 are rural migrants to Minya City, and the remaining 28 are villagers (see Appendix 1 for detailed information on all participants).

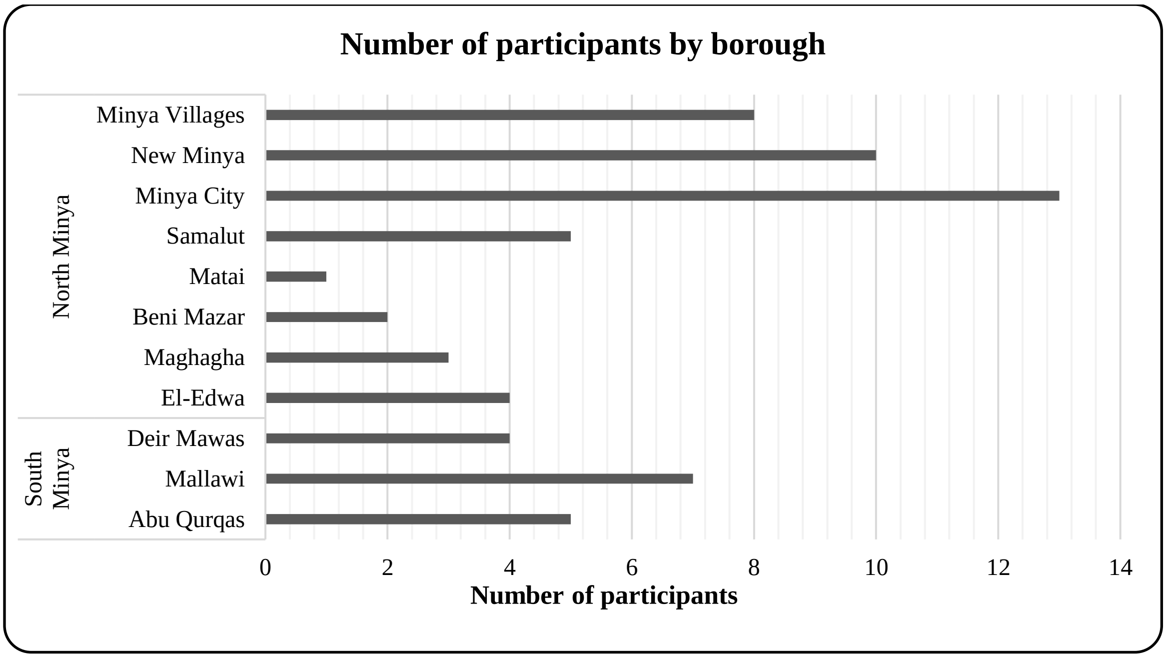


Figure 3.1: *Number of participants by borough*

Table 3.1*: Number and percentage of population in Minya by borough and region (CAPMAS, 2012) and the number and percentage of participants by borough and region*

Minya region	**Borough**	**Number of Population by borough**	**Number of Population by region**	**Population % by region**	**Number of Participants by region**	**Participants %s by region**
North Minya	El-Edwa	227589	2962324	64.69	46	74.19
	Maghagha	478533				
	Beni Mazar	509214				
	Matai	262392				
	Samalut	644760				
	Minya City	839836				
	New Minya					
	Minya Villages					
South Minya	Abu Qurqas	514251	1616937	35.31	16	25.81
	Mallawi	772521				
	Deir Mawas	330165				
Total population in Minya Governorate		4579261				

The skewness in the age structure is a result of the population pyramid in Egypt, which has a broad base of young people and becomes slim towards its top. Figure 3.2 shows the numerical breakdown of population in Egypt by age, while Figure 3.3 shows that the proportion of the present study's participants by age is representative of the whole population.

The participants' educational levels are also skewed, but this can be attributed to the imbalance in the age structure. Figure 3.4 shows that there is a correlation between educational levels and age: the younger the participant, the higher his/her educational level. Since most participants are either young or middle-aged, their educational levels are high. It is also clear from Figure 3.4 that participants with a high-school certificate or below (including basic education or no education at all) are few in number, and most are old.

Table 3.2: *Distribution of participants by gender, age, education and place of residence*

Education	**Place of Residence**	**Age**						
		Young (18-30)		**Middle-aged (31-50)**		**Old (> 50)**		
		M	**F**	**M**	**F**	**M**	**F**	**Total**
Postgraduate	**Urbanite**	1	4			1	1	7
	Migrant	1	1	2				4
	Villager	1		1	1			3
University	**Urbanite**	2	6	2				10
	Migrant			1		1		2
	Villager	6	8	4	1	1		20
Secondary or below	**Urbanite**	1	1		4	3	1	10
	Migrant	1						1
	Villager	1		2		1	1	5
	Total	14	20	12	6	7	3	62

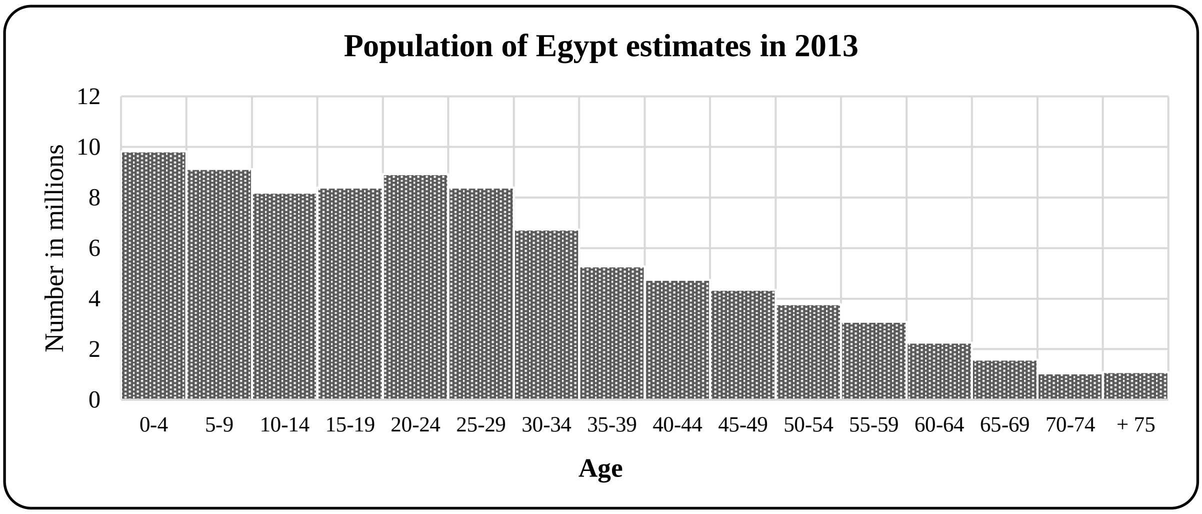


Figure 3.2: *Population of Egypt estimates by age (CAPMAS, 2016*)

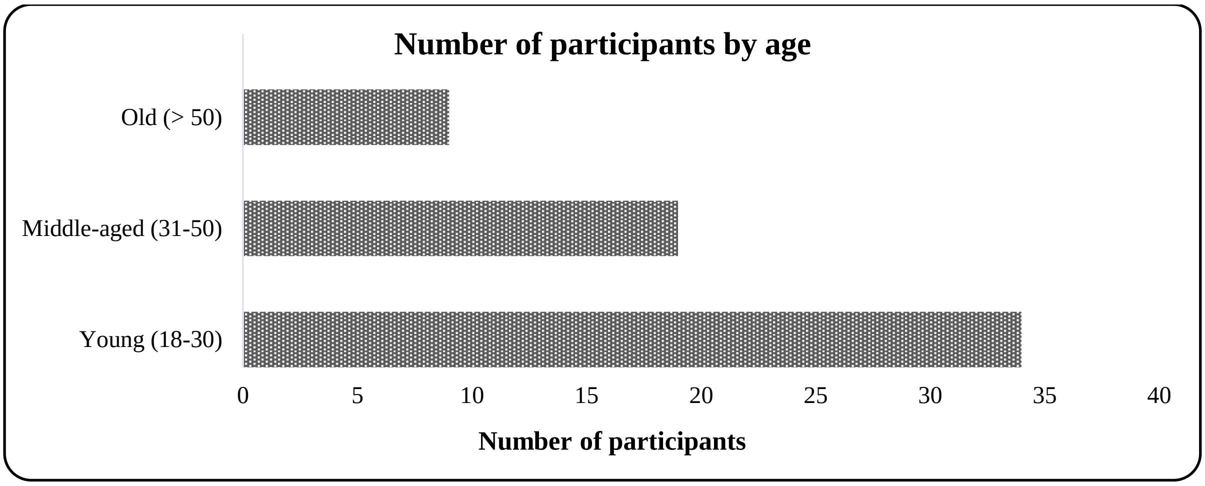


Figure 3.3: *Number of participants by age*

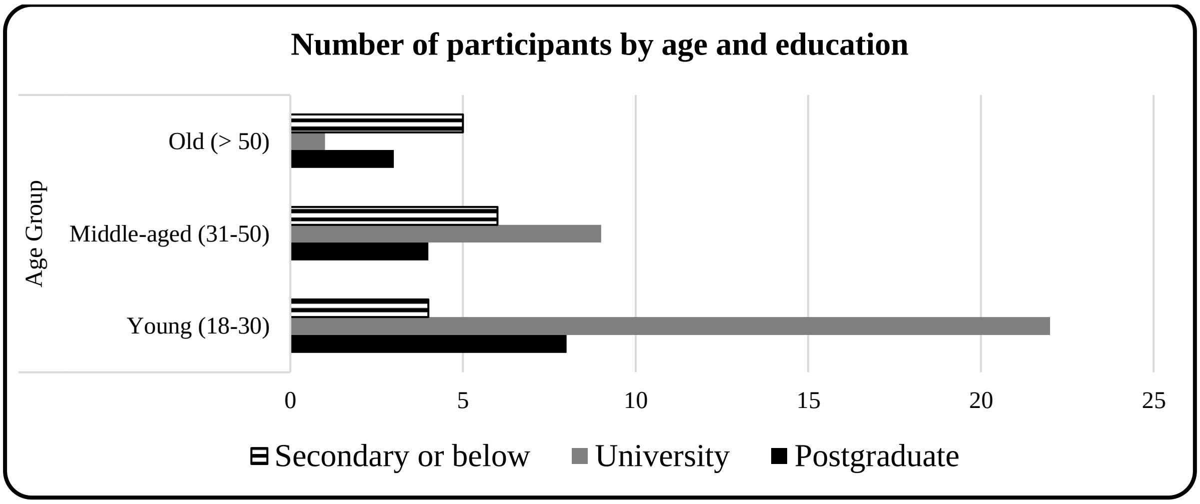


Figure 3.4: *Number of participants by age and education*

3.2.5 Linguistic variables under study

Arabic sociolinguistic studies have generally focused on consonantal variation at the expense of vocalic and non-segmental variation. The linguistic variables under investigation in the present study are consonantal (q), vocalic (KaLLiM, XALLiF and WaSSaL) and non-segmental (stress). These were selected as they are all (socio)linguistic variables that have linguistically equal but socially different variants (Fasold, 1990, p. 223) and behave systematically, not haphazardly, in ways that make them easy to quantify (Labov, 1972). In addition, they are "frequent enough in ordinary conversation to appear unsolicited in brief interviews" (Mesthrie, Swann, Deumert, & Leap, 2009, p. 78), especially (q) and (stress).

3.2.5.1 The (q) variable

(q) is one of the most salient variables in spoken Arabic and, hence, is used to label dialects (Al-Wer & Herin, 2011). The most widespread (q) variants are [ʔ] and [g] and they occur across the vast majority of Arabic dialects (see Chapter 4). CA, Beirut Arabic (BA), Damascus Arabic (DA) and Jerusalem Arabic (JA) are usually described as [ʔ] dialects, while the Gulf dialects are generally described as [g] dialects. In this study, the CA variant is [ʔ], as in [ʔalb] '*heart'*, while the MA variant is [g] as in [gɪɾd] '*monkey'*. The total number of observations of (q) in the present study is 4064.

3.2.5.2 Vowels

Vocalic variation is not as salient as consonantal variation, especially as in (q) and (dʒ), in sedentary (urban and rural) EA. However, variation in vowels is very salient in EA when sedentary (urban and rural) dialects are compared to Bedouin dialects. Because it is beyond the aim of this study, this issue is not investigated here.

It is shown in this study that CA and MA have 28 vocalic differences, all clarified with examples in Chapter 5. Among these, only three, (KaLLiM, XaLLiF and WaSSaL)[16], have been investigated. These three variables are all pertinent to differences in FORM II and FORM V verbs and derivatives. The variants of these variables can be summed up as follows:

Variable	CA	MA		Gloss	Number of Observations
		North Minya	South Minya		
(KaLLiM)	[ˈkallɪm]	[ˈkɪllɪm]	[ˈkallam]	*to speak*	399
(XaLLiF)	[ˈxallɪf]	[ˈxallɪf]	[ˈxallaf]	*to give birth to*	143
(WaSSaL)	[jɪˈwɑsˤsˤɑl]	[jɪˈwɑsˤsˤɑl]	[jɪˈwɑsˤsˤɪl]	*to give a lift to*	129

As is clear here, North MA is closer to CA than South MA; there are no vocalic differences in (XaLLiF) and (WaSSaL) between CA and North MA. Considering the number of participants from North Minya vis-à-vis South Minya (details in 3.2.4.1), the number of observations of (XaLLiF) and (WaSSaL) is much fewer than those of (KaLLiM).

[16] The differences between CA and MA in the (WaSSaL) variable occur only in the imperfect. For details, see section 5.2.2.1.

3.2.5.3 Stress

Stress placement in Arabic dialects is generally easy to predict (Watson, 2011) and is sensitive to syllable weight (Hellmuth, 2013). In this study, there is a focus on words composed of a sequence of heavy-light-light or [CVC.CV.CV] syllables; in CA, the stress is placed on the penultimate light syllable while it is assigned to the heavy syllable in MA. For instance, '*school'* is [madˈ**ra**sa] in CA and [ˈ**mad**rasa] in MA. The number of observations counted is 2779.

3.3 Data Analysis

3.3.1 Coding

3.3.1.1 Coding of social factors

To keep participants' data anonymous, each participant was given a code showing his/her gender, age, educational level and place of residence, in addition to a number for the borough where they come from followed by a dash and then another number to identify them individually within the borough (see details of all participants in Appendix 1). For instance, Participant SFMiUr6-1 is the first participant from Minya City (Borough 6 within Minya Governorate). She has a secondary-level education or below (S), is female (F), middle-aged (Mi), and comes from an urban centre (Ur). Regardless of the borough and participant numbers, this coding system gave 30 categories, given in Table 3.3, along with the number of participants under each code. Abbreviations in the codes are as follows: P = postgraduate education, U = university education and S = secondary education or below (middle, primary or no formal education); M = male, F = female; Y = young, Mi = middle-aged, O = old; and Ur = urbanite, V = villager and T = rural migrant to town.

3.3.1.2 Coding of linguistic factors

Since the aim of the study is to show whether MA participants converge on CA variants of the linguistic variables under study (e.g. whether they converge on CA [ʔ], the Cairene variant of (q)), coding was designed to reflect convergence or the absence of convergence. This is the dependent variable of the whole study. Thus, if a participant used a CA form (involving convergence), this was coded as ‘CA’, and if he/she used an MA form (involving no convergence), it was coded as ‘MA’. This way of coding facilitated logistic regression analysis (see details in section 3.3.4), which is based on a binary dichotomous dependent variable (Kleinbaum & Klien, 2010).

Table 3.3: *Number of participants by code*

Participant’s Code	Number	Participant’s Code	Number	Participant’s Code	Number
PFMiV	1	UFMiV	1	SFMiUr	4
PFOUr	1	UFYUr	6	SFOUr	1
PFYT	1	UFYV	8	SFOV	1
PFYUr	4	UMMiT	1	SFYUr	1
PMMiT	2	UMMiUr	2	SMMiV	2
PMMiV	1	UMMiV	4	SMOUr	3
PMOUr	1	UMOT	1	SMOV	1
PMYT	1	UMOV	1	SMYT	1
PMYUr	1	UMYUr	2	SMYUr	1
PMYV	1	UMYV	6	SMYV	1

3.3.2 Transcription

Focusing on specific variants in this study removed the need to transcribe the whole dataset. The entire word in which each variable occurred was transcribed, as closely as possible, using IPA symbols. Elan (version 4.9.1) was used as it is user-friendly and allows many font types, many font sizes, different languages, segmentation, annotation, copying, pasting, using many independent and dependent tiers and importing and exporting single and multiple files (including Praat and TextGrids). This last feature is very useful in exporting files transcribed using Elan to Praat and spreadsheets easily.

All variables were transcribed auditorily. Since all of them have phonetically distinct variants, identifying them was easy and the researcher did not need any instrumental analysis. For ease of reading, examples in this study will be broadly transcribed in IPA. As for Arabic names (e.g. place names), they will be given in their standard transliteration or translation if there is one or as they appear in Google Maps; otherwise, they will be transliterated according to the Romanisation System for Arabic adopted by the Permanent Committee on Geographical Names for British Official Use (PCGN) (1956) except for Notes 4[17] and 9[18] (see Appendix 2).

3.3.3 Spreadsheets

A separate spreadsheet was prepared for each variable under study (see a sample in Appendix 3). So that the spreadsheets could be used in statistical (logistic regression) analysis, all of them include information about the dependent variable and independent social and linguistic factors[19]. The dependent variable in all spreadsheets is the 'convergence' column, whether the variant realised as CA (involving convergence) or MA (involving no convergence). Columns relating to the social factors include participants' codes, `gender` (`male` and `female`), `age` (`young`, `middle-aged` and `old`) `education` (`postgraduate`, `university`, `secondary or below`) and `place of residence` (`villager`, `migrant` and `urbanite`). Columns related to the linguistic factors include `style` (`careful` and `casual`) and the sounds preceding and following the target variant. The last two factors were coded as `consonant`, `vowel` and `pause` in the (q) dataset and as `coronal`, `dorsal` and `labial` in the vowels datasets (KaLLiM, XaLLiF and WaSSaL). In the (stress) dataset, the sounds preceding and following stress were disregarded, as they were hypothesised not to have any effect on stress assignment and there is no literature to support

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[17] In the PCGN's guide, when the noun or adjective ending in ة or ـة is indefinite, or is preceded by the definite article, it is transliterated as 'h'. Here, it is transliterated as 'a' unless the noun is joined to another noun (genitive construction). For instance, مَسْأَلَة *issue* is transliterated as *mas'alah* in the PCGN's guide, but here as *mas'ala*.

[18] Though the PCGN's guide states that transliterating doubled consonants should be done via doubling the same letter, the combination of the consonant character yā' with a shadda preceded by a kasra (ـِيّـ), medially or finally, is transliterated as *īy* rather than *iyy*. Here, the shadda is transliterated as double letters all the time. For instance, مِصْرِيَّة *Egyptian* (fem. sing.) is transliterated as *Mişrīyah* according to the PCGN's guide but here as *Mişriyya*.

[19] As stated by Tagliamonte (2011), a 'variable' is just the linguistic variable that varies and is investigated (i.e. the dependent variable), while 'factors' or 'factor groups' are "the aspects of the social or linguistic context that influence the variable phenomena (i.e. the independent variables)" (p.9) which are also called predictors. Accordingly, the independent variables in this study are referred to as factors.

the opposite view.

3.3.4 Statistical analysis

3.3.4.1 Choosing the tool: Logistic regression

Since this variationist study is aimed at exploring the effects of many social as well as linguistic factors on a binary dichotomous dependent variable (i.e. convergence of MA on CA), logistic regression was chosen for statistical analysis due to its "mathematical modeling approach that can be used to describe the relationship of several Xs to a dichotomous dependent variable" (Kleinbaum & Klien, 2010, p. 5). Because this tool[20] involves many factors, it is called multiple logistic regression, which allows testing all factors together, either in isolation or in interaction, and gives results that clarify which factor is most likely to predict the occurrence of the response/dependent variable. In variationist sociolinguistics, the VARBRUL programme (Sankoff, 1975) was used for more than 30 years to measure the effect of multiple factors on a (binary) linguistic variable (Johnson, 2009, p. 360). This was done via the toolkit Goldvarb. Goldvarb, the latest version of which is known as Goldvarb X (Sankoff, Tagliamonte & Smith, 2005) is an adaptation of VARBRUL, developed originally for use with Macintosh computers. It dominated variationist sociolinguistics analysis for a long time. But because of some criticism directed at Goldvarb, especially regarding its overestimated significance (Johnson, 2009, p. 363), Goldvarb was not used for the present study and a better toolkit via which logistic regression could be applied was sought.

3.3.4.2 Fixed or mixed logistic regression?

Logistic regression can be fixed or mixed (Everitt & Howell, 2005). Fixed logistic regression tests fixed factors alone, while mixed logistic regression tests fixed and random factors together. Fixed logistic regression assumes the independence of observations (Johnson,

[20] A statistical tool is a statistical model, e.g. logistic regression, ANOVA, etc., while a statistical toolkit is a software package, e.g. *SPSS*, *Goldvarb*, *Rbrul*, *R* (Tagliamonte, 2011, p. 130).

2009, p. 363) and does not consider the overlapping of factors, observations or subjects. Accordingly, applying fixed regression modelling may lead to exaggerated significance and "create inappropriate aggregations, especially with unbalanced numbers of tokens across individuals (as is typically the case)" (Tagliamonte, 2011, p. 130). Because the present study is aimed at showing which social or linguistic factor motivates or is more likely to trigger convergence of MA on CA, and since fixed regression assumes the independence of observations, which is not achieved in the data in the present study, mixed logistic regression, also known as generalized linear mixed-effects modelling (GLMM), was adopted instead.

3.3.4.3 Why GLMM?

GLMM is considered an extension of logistic regression and its benefits can be summed up as follows:

> Mixed-effects models [GLMM] provide a flexible and powerful tool for the analysis of grouped data… Examples of grouped data include longitudinal data, repeated measures, blocked designs, and multilevel data. The increasing popularity of mixed-effects models is explained by the flexibility they offer in modelling the within-group correlation often present in grouped data, by the handling of balanced and unbalanced data in a unified framework, and by the availability of reliable and efficient software for fitting them. (Pinheiro and Bates, 2000, p. vii)

The data in the present study is grouped; that is, it is not independent. For instance, a speaker may have used 70 items, where some of them are frequent and the others not, some of them are repeated many times while the rest are not, and some of them are highly correlated with foreign education (as is the case with many loanwords) or religious education (as is the case with Fuşḩā words) while the rest are not. In these cases, a realisation may be grouped/correlated with a given social category (e.g. education, age, or gender) or with the subjects themselves, and using GLMM may better account for the dependence and/or overlapping in the data, especially as it takes inter-speaker variation and inter-item variation into account.

3.3.4.4 The mechanism of GLMM

GLMM depends on two types of factors, fixed and random. Fixed factors are either categorical with a few levels (e.g. gender: *male* and *female*; education: *educated* and *non-educated*; place of residence: *villager* and *migrant*) or continuous (e.g. pitch level, income). Factors that cannot be easily put into categories (or levels) are classes as random, especially when they are elicited from a big population. For example, a dataset containing 3000 tokens elicited from 40 participants cannot be divided into discrete levels. In this case, *item* and *participant* are treated as random factors. Analysing fixed and random factors in the same model solves the problems of linearity, normality and independence of observations. If a fixed logistic regression and a mixed logistic regression (see the difference in section 3.3.5.2) are applied to the same dataset to examine the probability of some fixed factors leading to the distribution of data for a given linguistic variable, the results would be different, with a higher and maybe overestimated significance in the fixed model (Tagliamonte, 2011, p. 141). Applying the two methods to the datasets in the current study yielded different results: fixed-effects logistic regression yielded highly significant effects for factors/predictors, while testing using mixed-effects logistic regression greatly reduced the level of significance.

3.3.4.4.1 Random-intercept or random-slope GLMM analysis?

GLMM analysis can be fitted through random-intercept or random-slope models. The difference between these models is that "a random intercept model estimates separate intercepts for each unit of each level at which the intercept is permitted to vary, while a random-slope model estimates separate slopes (i.e. coefficients, betas, effects, etc. …) for each variable for each unit of each level at which that slope is permitted to vary" (Dinno, 2014). In this way, a random-intercept model assumes that slopes are fixed across different subjects and/or items

(Cohen, Cohen, West, & Aiken, 2003). Accordingly, if the effect of *gender* (with two levels: male and female) on use of the post-vocalic /r/ (in English words like *car* [kɑː] and *cart* [kɑːt]) is tested in a random-intercept model, with *speaker* and *item* as random effects, the slope for males and females will be assumed to be the same for all speakers and items. But this is not valid because some females could be expected to use items containing post-vocalic /r/ more than males and, therefore, the slope for females is different from that for males. Technically, *gender* here is a *between-speaker* and *within-item* factor. Therefore, for better results for such models, a random-slope (or *maximal*) model is needed (Barr, Levy, Scheepers & Tily, 2013), is needed.

In such a proposed model including one fixed effect, there is no problem in fitting the maximal (random-slope) model. But if there is more than one fixed effect, fitting a random-slope model including all effects, especially if interactions are included, will probably not yield any results. In such cases, Barr, Levy, Scheepers & Tily (2013) suggest some procedures to adopt, as follows:

1. If a factor is between-unit (item or speaker), a random intercept is sufficient and there is no need for a random slope (p. 275). For instance, in the previous example with *gender* as a fixed factor, *gender* is a between-speaker factor, since no speaker can be male and female at the same time; hence, a random-intercept model is sufficient.
2. If a factor is within-unit (item or speaker) but there is only one unit, a random intercept is sufficient (p. 275). For instance, in the previous example, *gender* was assumed to be a fixed within-item factor because it was also assumed that there are many different items/observations/words. If this is the case, a random-slope model is needed; but in the case of testing the effect of *gender* on realising one post-vocalic /r/ word, a random intercept-model is sufficient.
3. If a within-unit factor has very few observations (e.g. very few words or speakers), a

random-slope model should be attempted first (p. 275).

4. If a factor is within-unit (item or speaker) and there are many units, then a random slope is needed (p. 275).
5. In the case of interactions between within-unit factors, a random-slope model should also be attempted. But if one of these factors involved in the interaction is between-unit, “the random slope associated with the interaction cannot be estimated, and is not needed” (p. 275).
6. If a random-slope model is needed and there is more than one within-unit fixed factor, then fitting a random-slope model with all these factors will probably not converge (i.e. yield any reliable results), especially if these factors are categorical. In such cases, a random-slope model can be fit with only the factor(s) of theoretical interest (p. 276); namely, the factors which are more responsible for conditioning the response variable. This depends on the hypotheses and can be confirmed by descriptive statistics.

Accordingly, these procedures will be followed when statistically analysing the data under study.

3.3.4.5 Choosing the toolkit to perform GLMM & why

To apply GLMM and to avoid overestimated significance that may occur in Goldvarb in particular, the researcher looked for a better toolkit and finally decided to use the *glmer* function available in the *lme4* package (Bate, Maechler, Bolker & Walker, 2015) in R (R, the Project for Statistical Computing, 2015). R is a very powerful toolkit for statistical analysis that has become widely used in science, social science and the humanities, probably thanks to its wide functions and powerful graphics (Baayen, 2008). R is increasingly used in linguistic analysis (Bresnan & Hay, 2008). The *glmer* function in the *lme4* package is used for GLMM analysis and has many advantages. First of all, it allows for testing of factors alone or in interaction. Its results are also easily displayed and contain information pertaining to the three types of evidence used in language variation and change practice; that is, “(1) statistical significance; (2) relative strength of factors …; and (3) constraint ranking …" (Tagliamonte, 2011, p. 148). 1 is achieved via the p-value in the (Pr(>|z|) column; 2 via the significance codes, starting with the $p < 0.05$ significance level indicated by one star; and 3 via the relative coefficient/estimate values. In addition to these, the *glmer* function generates other indicators that are important when comparing more than one model. These include the *Akaike Information Criterion* (AIC) and *Bayesian Information Criterion* (BIC). The AIC and BIC refer to the strength of the model as a whole in explaining the variation in the dependent variable. The lower the AIC and BIC values, the better the model.

3.4 Conclusion

In this chapter, the methodology adopted for the data collection and data analysis phases was clarified. Data included recorded interviews with 62 participants distributed geographically across 11 boroughs in Minya Governorate and socially according to four social factors: gender, age, education and place of residence. The data also include an online perception questionnaire answered by 61 participants, some of whom were interviewed earlier. Data analysis depended on mixed logistic regression via the statistical toolkit R. The advantages of such analysis, suitability for the datasets of the present study, and mechanisms were also elucidated. In Chapter 4 on (q), Chapter 5 on (KaLLiM), (XaLLiF) and (WaSSaL), and Chapter 6 on (stress), the protocol of data analysis will be clarified with reference to the steps of analysis explained here.

Chapter Four: (q)

4.1 Introduction

In this chapter, the focus is on the ق variable, which is pronounced in modern Fuṣḥā as [qɑːf] and will be referred to here as (q). The (q) variable is one of the highly-salient variables characterising Arabic dialects (Al-Wer & Herin, 2011). The variable's salience and its variants in spoken Arabic are highlighted. There is then a focus on the variants of the variable in Egypt in general and in CA and MA in particular. The literature on (q) is extensive; therefore, the literature review here is limited to the speech communities where the variants of (q) include either [g] or [ʔ] or both. These include the Levant (Palestine, Jordan and Syria), North Africa (Algeria and Morocco) and Egypt. The literature review is followed by the research questions and hypotheses. Finally, the results of analysing the social as well as the linguistic factors are given.

4.2 The (q) Variable in Arabic: Overview

The (q) variable has been studied extensively in Arabic-speaking speech communities. This is because of its high salience and "social and geographical importance … as a carrier of local or regional loyalties" (Abdel-Jawad, 1981, p. 59) that made its variants the main criterion for classifying dialect boundaries and isoglosses in the Arab World (Abdel-Jawad, 1981; Al-Wer, 1999; Al-Wer & Herin, 2011). The variants of (q) include:

- the voiceless uvular plosive [q], as in *qəltu*[21] dialects in Iraq (e.g. Christian and Jewish Baghdadi Arabic) (Blanc, 1964) and big cities in North Africa (e.g. Tunis, Algiers and Casablanca). [q] is also the modern Fuṣḥā variant[22] which is used in very formal styles

[21] *qəltu*, which means '*I said*', is the shibboleth of the old sedentary dialects of the Mesopotamian region. It has two features that distinguish this group of dialects from the Bedouin dialects: the voiceless uvular pronunciation of (q) as [q] and the *-tu* inflection of the 1st sing. perfect. *Gilit* dialects are the Bedouin dialects of Lower Iraq, in which the variant of (q) is [g] and the 1st sing. inflection of the perfect verb is *–it* (Blanc, 1964; Khan, 2015, p. 44).
[22] The modern Fuṣḥā variant is a voiceless uvular plosive (Anīs, 1952, p. 72; Watson, 2007, p. 17), which diverges from the description offered by Sībawayh (760–796 AD), who described it as a voiced uvular plosive (Al-Nassir, 1985, p. 69). Anīs claims that the variant, according to Sībawayh's description, could have been very similar to [ɣ], the variant still used by some tribes in Sudan (1952, p. 72).

(e.g. reading and codeswitching between Fuşḩā and dialect) or in loanwords from Fuşḩā. The number of these loanwords differs from one dialect to another. In Egypt, for example, [ˈɾˤɑqɑm] '*number*', [ˈmɑwqɪʕ] '*location*', [ħʊˈquːq] '*rights*' and [qɑwɑˈniːn] '*laws*' are all borrowed from Fuşḩā with [q]. In BA, none of these is borrowed from Fuşḩā, and all are realised with [ʔ] (Abdel-Jawad & Abu Radwan, 2013);

- the voiced velar plosive [g], as in *gilit*[23] dialects in Iraq (e.g. Muslim Baghdadi Arabic) (Blanc, 1964), Bedouin dialects and sedentary dialects that were formed mainly as a result of Bedouin migrations (e.g. UEAr). Examples include [ˈgalam] '*pen*' and [gɪɾd] '*monkey*'.
- the glottal stop [ʔ], as in the dialects of the old urban Arabic centres (e.g. Cairo, Beirut, Damascus and Jerusalem) (Holes, 2004). Examples include [ʔabl] '*before*' and [faɾʔ] '*difference*';
- the voiceless velar plosive [k], found in the rural dialects of central Palestine (Al-Khatib, 1988), as in [ˈkamal] '*camel*';
- the voiced uvular plosive [ġ], as in the Western regions of Northern Yemen (Watson, 2007, p. 17) in words like [ġalb] '*heart*'; and
- the voiced velar fricative [ɣ], as used in loanwords from Fuşḩā in Central Sudanese Arabic (Watson, 2007, p. 17) such as [musˈtaɣbal] '*future*'.

4.3 The (q) Variable in EA

EA has many (q) variants which are stratified geographically in a way that reflects the history of each dialect in terms of Arab migrations and urbanisation. According to Behnstedt & Woidich's categorization (1985, Map 6), the variants of (q) in Egypt (see Map 4.1, and Map 1.2 on the dialect isoglosses in Egypt) include:

- the glottal stop [ʔ] in central dialects (CD), including Cairo, northeastern dialects (NED 1 and NED 2), eastern dialects (ED 3) and northern Middle Egypt (NME 1);

[23] See footnote 21.

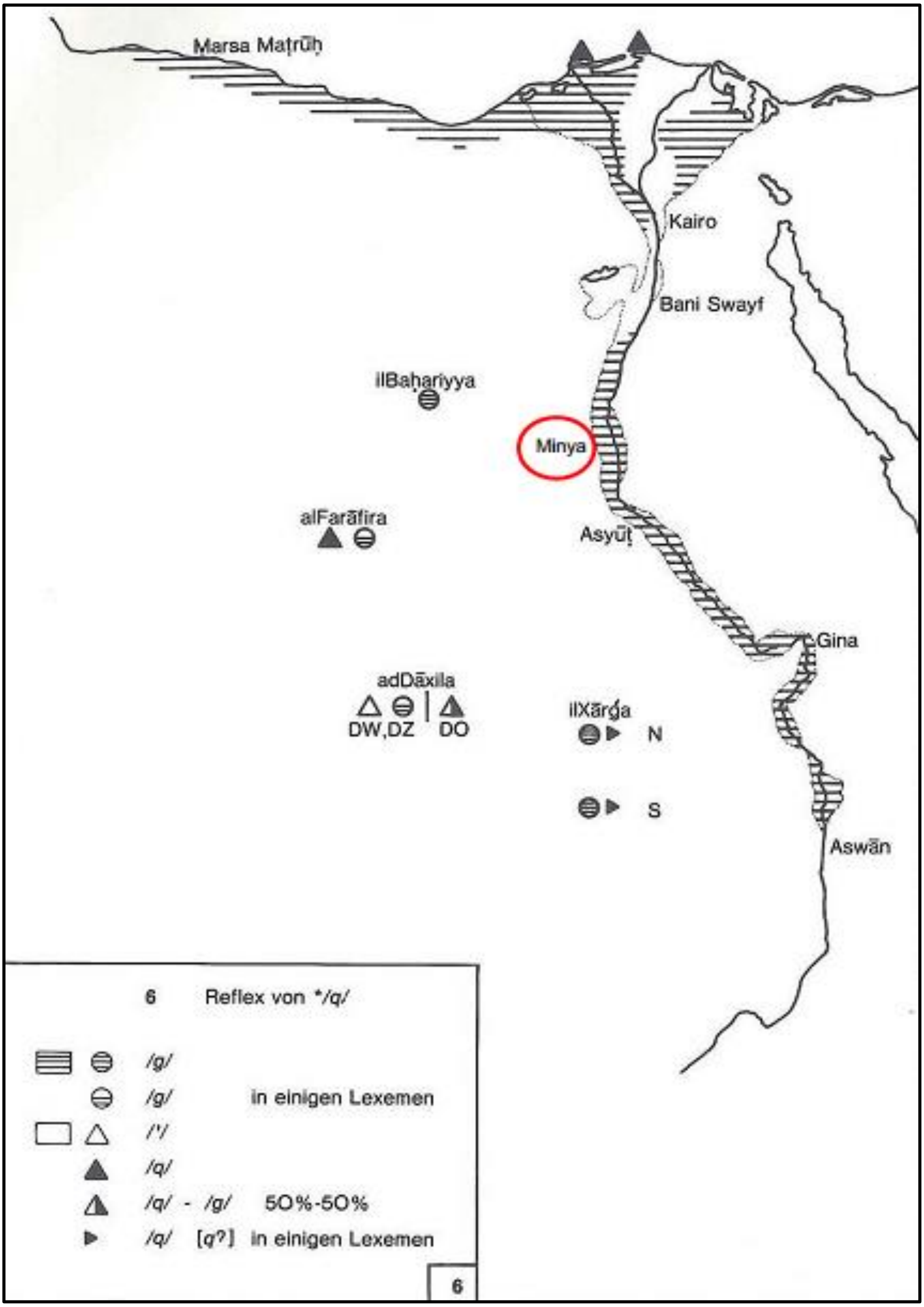
- the voiced velar plosive [g] in eastern dialects (ED 1 and ED 2), western dialects (WD 1, WD 2, WD 3 and WD 4), northern Middle Egypt (NME 2), southern Middle Egypt (SME), Upper Egypt (UE 1, UE 2, EU 3 and EU 4) and Bahariya Oasis in the western desert; and
- the voiceless uvular plosive [q] in Burullus on the Mediterranean and Al-Farafra Oasis in the Western Desert. In Kharga and Dakhla Oases in the Western Desert, [q] and [g] occur side by side.

Two things have to be mentioned here. First of all, these categorizations are based on data collected in the late 1970s and early 1980s. Many of these features must have changed since then. Added to this, the data was dialectological in nature: that is, the aim was to collect the traditional features and avoid any interdialectal features.

4.3.1 (q) in CA

The current variant of (q) in CA is [ʔ]. As Garbell (1958) claims, the merger between [q] and [ʔ] occurred between the 11th and the 15th centuries in the Lebanese, Syrian and Palestinian urban dialects (pp. 311-313) and, over the course of time, diffused to many urban dialects in the Arab World (Cowan, 1960). Since Cairo is not far from Palestine and had a deep contact with the Levant as states within the Abbasid Empire (750-1258) and then the Ottoman Empire (1299-1923), it is not unlikely that [ʔ] spread from the Levant to CA. Abdel-Jawad (1981) notes that the timing estimated by Garbell, between the 11th and 15th centuries, is significant since it covers a long period during which the Islamic (Abbasid) Empire declined, which led to the weakening of the position of Fuşḩā Arabic, limiting it to religious centres and its being affected by other languages (e.g. Turkish and Persian) (p. 2 and p. 166). This means that Fuşḩā ceased to have the same influence it had had before and, in this regard, the Fuşḩā variant [q] may have lost its prestige in competition of the new prestige of [ʔ].

As Woidich (1994) observes, what is known nowadays as CA is a dialect mixture that developed thanks to inter-dialect contact between Cairenes and the huge number of villagers



***Map 4.1**: Distribution of the (q) variants in Egypt (Behnstedt and Woidich, 1985, Map 6)*

who migrated to Cairo following the 1835 plague, which was so severe that it led to the loss of a third of Cairo's population (Lane, 1836) (for details, see section 3.2.1.1). Since then, CA has changed a great deal, but has [ʔ] remained intact. As attested in all the early studies conducted on CA at the end of the 19th century (Spitta, 1880; Cameron, 1892; Spiro, 1895; Vollers, 1895; Nallino, 1900; Dirr, 1904; Willmore, 1901, 1913), [ʔ] was the variant used by Cairenes. However, [g] was also used by migrants from Upper Egypt and the Delta (Cameron, 1892, p. xi; Dirr, 1904, pp. 20-21). Recently, migrants, especially those from Upper Egypt, have been converging on [ʔ] (Miller, 2005).

From Cairo, [ʔ] diffused to many parts in Delta, including NED 1, NED 2 and ED 3 (see Map 1.2). Woidich (1996) and Behnstedt (2006) postulated two scenarios for this diffusion. According to the first scenario, [ʔ] spread from Cairo along a trade route on the Nile banks to Damietta, Medieval Egypt's main harbour, gradually affecting the commercial centres on both sides and finally supplanting the traditional Bedouin variants there. The other scenario could be the existence of [ʔ] across the Delta before being replaced by the Bedouin variant [g] as a result of Bedouin migration from the east and west and resistance along the trade route because of the Cairene influence. In this case, [ʔ] is a relic variant. In the modern age, Cairene [ʔ] also diffused to northern Middle Egypt (NME 1), including parts of Beni Suef and Faiyum Governorates, and some parts in WD, including Alexandria and Rasheed (part of Beheira Governorate). The diffusion of [ʔ] to Alexandria did not start until the repair of Maḥmūdiyya Canal in 1817, which served to deliver the Nile water to Alexandria and as a route for cargo ships, thereby forming another trade route through which Cairene officials and traders carried CA [ʔ] to Alexandria, which was recovered under Muhammad Ali (1805-1843) and his successors and became again the main harbour in Egypt (Behnstedt, 2006). CA [ʔ] is still diffusing across Egypt, especially in urban centres, because of the prestige of CA gained most likely as a result of the high standing of its users, including politicians and celebrities, its heavy usage in the media, being the main tool in the widely-circulated mass production of Egyptian cinema, radio and TV, and being the main tool of spoken as well as written folk literature (Rosenbaum, 2008, 2011).

Why did [ʔ] replace the variant before it? Ahmad (2014) claims that the variant preceding [ʔ] was [q], which came with the Muslim Conquest of Egypt in 641, and that Egyptians did not have /q/ in the phonemic inventory of the language they formerly spoke. When the Arabisation of Egypt was going on, Egyptians tried to pronounce [q] but they could not and their pronunciation was moved back to [ʔ] (p. 56). This is supported by the fact that in CA there is a tendency to retract Fuşḩā consonants, especially towards dentals or alveolars away from interdentals (Selim, 1967, p. 135) or from fricatives towards plosives (Birkeland, 1952, p. 53) as in these pairs:

Fuşḩā	Interdental	/θ/	/ð/	/ðˤ/
CA	Alveolar	[s] or [t]	[z] or [d]	[dˤ] or [zˤ]

Furthermore, [q] might have changed to [ʔ] as the "uvular articulation requires much more energy than the glottal closure and release" (Dendane, 2013, p. 5). However, it seems more likely that the change from one sound to another could not be attributed to one single factor; rather, it may be a result of a group of factors (e.g. ease of pronunciation, second language acquisition problems, and contact with other languages). Investigating why [q] changed to [ʔ] in CA or to [g] in MA is beyond the scope of this study.

4.3.2 (q) in MA

The merger of [q] with [g] started in Upper Egypt in the 14th century (Birkeland, 1952, p. 54). The current variant of (q) in MA is [g]. [x] is another variant in MA, but it is only found in [waxt] '*time*' and its derivative adverb [dıl-waxt(i)] '*now*'. As mentioned in 2.5.1, sources documenting MA are scarce and relatively modern. The oldest of these is Maşlūḩ (1968), who gives [g] as the MA variant. Doss (1981) and Behnstedt & Woidich (1985) give the same variant. As is clear from Map 4.1, the [g] variant is dominant in Egypt and it corresponds to the Bedouin variant nearly everywhere in the Arab World. This strongly suggests that early Bedouin migration from Arabia following the Muslim Conquest of Egypt in 614, and later in the Middle Ages from the west, was a very significant factor in forming EA. This is also confirmed by socio-historical facts. The plagues that struck Egypt in the 14th and 15th centuries had catastrophic consequences, after which Maghrebi (North African) migrations compensated for the population loss and villages completely composed of Maghrebi migrants were established in Upper Egypt and the Delta (Behnstedt, 2006). This is attested in the names of hundreds of villages such as ‘arab ‘*Bedouins*’ Awlād, Bany, Banu ‘*sons of’* and Nazla ‘*descendants of*’ (Murray, 1935; Woidich, 1996), all of which refer to accumulations of Bedouin clans or extended families that became sedentary with the passage of time.

The real-time evidence regarding [g] in MA (Maṣlūḥ, 1968; Doss, 1981; Behnstedt & Woidich, 1985) is all dialectological. As is well known about dialectological data, it is traditionally collected from non-mobile old rural males (NORMs) (Trudgill & Chambers, 1998). In the speech of these informants, there are hardly any interdialectal features, and even if there are any, they are disregarded by data collectors. It is believed here that MA speakers, especially those in urban centres, probably started switching to CA [ʔ] early in the 1970, if not earlier because of the contact between Minyāwis and Cairo. As mentioned earlier (see 2.5.4), contact between CA and MA has increased since the launch of radio in 1934 and TV in 1959, and this has been enhanced with the expansion of railways and highways between the 1970s and 1990s. Evidence that [ʔ] was probably converged upon by some MA speakers is found in Doss (1981), who avoided collecting data from big urban centres in Minya such as Minya City, Samalut Town and Mallawi Town, as these administrative and business centres were likely to have been affected by CA (p. 2). As the (q) variable is one of the salient features in EA, it may have been among the first variables to be affected.

4.3.3 The envelope of variation

As mentioned above, the CA variant of (q) is [ʔ] and the MA variant is [g]. The variant [q] is used by both CA and MA speakers in loanwords from Fuşḫā. This commonly relies on the context entailing topic, setting and audience. [q] is usually adopted in religious talks or discussions where quotations from the scripture are used. It also occurs, though to a lesser extent, in literary discussions as well as political speeches. If such discussions or speeches are in public, [q] is expected more, as is the case in Friday sermons, political speeches and debates on TV or on the radio. This kind of diglossic codeswitching between the variant of the H form (i.e. [q] in this case) and a variant of the L form (e.g. CA [ʔ] or MA [g]) is never separate from the syntax of the whole utterance. For example, if someone wants to say '*In fact, this is a very important issue*', they may start as

I. fɪl ħaˈqiːqɑ ˈhaːðɪhi ˈqɑdˤijɑ ˈmʊhɪma lɪl-ˈɣɑːjɑ (Fuşḫā)

II.

i. fɪl ħaˈʔiːʔa diː ˈʔɑdˤɪjɑ ˈmʊhɪma ˈxɑːlɪsˤ (CA)

ii. fɪl ħaˈgiːga diː ˈgɑdˤɪjɑ ˈmʊhɪma ˈxɑːlɪsˤ (MA)

Using the H (Fuşḫā) fem. sing. demonstrative [ˈhaːðɪhi] '*this*' and adverb [lɪl-ˈɣɑːjɑ] '*very*' in I necessitates using the Fuşḫā variant of (q) in the two nouns [ħaˈqiːqɑ] '*fact*' and [ˈqɑdˤijɑ] '*issue*'. In contrast, using the L demonstrative counterpart [diː] '*this*' and adverb [ˈxɑːlɪsˤ] '*very*' in II.1 and II.ii necessitates the use of an L variant of (q) in the two nouns [ħaˈʔiːʔɑ/ ħaˈgiːgɑ] and [ˈʔɑdˤɪjɑ/ ˈgɑdˤɪjɑ]. III and IV are not expected in EA.

III. fɪl ħaˈʔiːʔa ˈhaːðɪhi ˈʔɑdˤijɑ ˈmʊhɪma lɪl-ˈɣɑːjɑ

IV. fɪl ħaˈgiːga ˈhaːðɪhi ˈgɑdˤijɑ ˈmʊhɪma lɪl-ˈɣɑːjɑ

Because the present study aims to explore how far CA [ʔ] has affected MA [g], the variant [q] has been overlooked. Convergence from MA on CA would be from [g] to [ʔ], and MA speakers' use of [q] by no means seems to be a result of the diffusion of CA to Minya. Rather, the occurrence of [q] depends on the context, as clarified above. As mentioned in 3.2.4, the data collected depended on two styles, the elicitation method for which was completely aimed at motivating the participants to use the L form and to keep away from the H (Fuşḩā) form so that [q] was not used all. However, some speakers used [q] in some tokens in which there is no variation (e.g. [ʔɪl-ˈqɑːhɪɾɑ] ‘*Cairo*’) or others in which there is variation (e.g. [qɑˈdiːm] ‘*old*’). In both cases, these very few tokens were ignored for the reason mentioned above. Apart from the first case, any cases which are in CA [ʔ] (e.g. [ʔaˈdiːm] ‘*old*’ and [ˈʔalam] ‘*pen*’) are definitely [g] in MA (e.g. [gaˈdiːm] and [ˈgalam]). It was mentioned above that in MA [x] is another MA variant that is only used in [waxt] ‘*time*’ and its derivative adverb [dɪl-waxt(i)] ‘*now*’. Even in this case, [g] may be used instead, and many participants in the present study already used [wagt] and [dɪl-wagt(i)].

4.4 Sociolinguistic Background of (q)

The literature on variation and change in (q) in the Arab World reflects many social changes: urbanisation, education, domestic and transnational migration, change in gender roles, etc. Along with these social changes, the perception of the variants of (q) has changed, probably because of people’s exposure to different dialects through migration, war-induced displacement, and the spread of satellite channels and the Internet. These have always been accompanied by the diglossic situation in the Arab World, which has also led to more variation in the use of (q), as is the case in codeswitching between the H form (Fuşḩā) variant [q] and the L form variant (e.g. either [ʔ], [g], [k] or some other variant). The literature to follow on (q) is here limited to the studies conducted on speech communities that have [g] and/or [ʔ] as the variants of (q). This is, first, because the literature on (q) in the Arab World is large and, second, because the current study is exploring the convergence of MA variant [g] on the CA variant [ʔ].

4.4.1 Sociolinguistic literature from the Arab World

4.4.1.1 (q) in the Levant

4.4.1.1.1 Jordan

Abdel-Jawad (1981) examined variation in (q) and its correlation with style, ethnicity, education and sex in Amman Arabic (henceforth AA). He listed some variants in AA: [q], [ʔ], [g] and [k], with the first three described as markers and the last as a stereotype related to Fallaḩīn 'villagers' (p.177). Abdel-Jawad reported the association of [q] with Fuşḩā and its literary as well as religious prestige, [ʔ] with urbanisation and modernisation, [g] with toughness, manhood and masculinity, and [k] with Fallaḩīn and "comment, parody and ridicule by the other groups" (p. 177).

Table 4.1*: Distribution of (q) variants by sex in the urban, Bedouin and Fallāḩi groups (compiled from Tables 4.1, 4.2 and 4.3 in Abdel-Jawad (1981, p. 175))*

Origin	**Sex**	**(q) variants**				**Number of tokens**
		[q]	[g]	[k]	[ʔ]	
Urban	Females	23%			77%	1595
	Males	45%	9%		46%	2848
Bedouin	Females	24%	30%		46%	672
	Males	35%	61%		4%	2358
Fallāḩi	Females	28%		46%	26%	1457
	Males	59%		29%	1%	2598

The results in Abdel-Jawad (1981) show that sex was the most significant factor in language variation and change in AA: males used the "standard prestigious" variant [q] more than females (p. 324) because standard forms are "associated with formality, public life and the outside world which are not the domains of women" (p. 332). At the same time, females, either urbanites (originally from urban Palestinian centres), Bedouins (from Palestinian or Jordanian Bedouin origins) or Fallaḩīn (migrants from the countryside of Palestine), were found to use the urban variant [ʔ] more than males, as it was "socially evaluated as soft, gentle, light and feminine" (p. 332). It is clear here that there is some confusion because of mixing between what is 'standard' and what is 'prestigious', the same confusion that was shown by Ibrahim (1986), who clarified the difference between 'standard' and 'prestige' languages: the first are those in which there is no difference between standard and prestigious varieties, and the latter are those in which standard and prestigious varieties do not always coincide. Ibrahim duly claimed that Fuşḩā (the H form in diglossic terms) cannot be described as the standard variety, as Abdel-Jawad did[24], saying that "the identification of H [Fuşḩā] as both the standard and the prestigious variety at one and the same time has led to problems of interpreting data and findings from Arabic sociolinguistic research" (p. 115). This confusion led Labov (1982) to interpret male/female linguistic differentiation in Arabic as an irregularity.

Considering [q] to be the Fuşḩā variant and excluding it, the results of [ʔ] and [g] in Abdel-Jawad (1981, p. 175) led to a conclusion very similar to that drawn in most studies conducted in Western speech communities. Females used [ʔ] more than males, while males used [g] more than females. If [ʔ] is associated with urbanisation and modernity and [g] with Bedouin life and toughness, according to Abdel-Jawad (p. 176), this would explain why females favoured the urban, prestigious variant, while males used the traditional, non-standard variant. These results are in agreement with Labov's (1990) principles *I* and *Ia* regarding the role of sex in language variation and change (see section 3.2.5.1 for details). Results also showed that the higher the educational level of females, the higher their use of [ʔ] and the lower their use of [g], and vice versa (p. 261). The only result inconsistent with Labov's principles is that Fallāḩi females, especially uneducated females (p. 177), used the stigmatised variant [k] more than males. Abdel-Jawad attributed this habit to the role assigned to Fallāḩi women in a society like that of Amman in the early 1980s, whereby they were expected to stay at home and bring up children, thus maintaining their dense social networks.

Al-Khatib (1988) investigated variation in (q) in Irbid (located 90 km to the north of Amman) and its correlation with age, sex, education and ethnicity. Ethnicity involved two

[24] Abdel-Jawad (1987) explored this later and came to the same conclusion as that detailed by Ibrahim (1986).

groups: Horanis and Fallaḩīn. Horanis came to Irbid starting from the 1930s, and Fallaḩīn migrated from the rural areas of the West Bank of Jordan (part of Palestine after 1988) following the two Arab-Israeli wars in 1948 and 1967. Sex was found to be the most significant factor behind using the (q) variants, with males favouring [q] more than females because of the latter group's being away from public life, where [q] is perceived to be most needed. If [q] is excluded by virtue of its being the Fuşḩā variant, then females from both ethnicities used [ʔ] more than males apparently because "men consider the urban variant [ʔ] more feminine, [and] therefore they attempt to avoid using it as much as possible" (p. 141). The difference between the percentages of [ʔ] as used by females and reported by Al-Khatib (6%) compared to that reported in Abdel-Jawad (1981) (77%) is large. As for [g], it was used by Horani females slightly more than by males as well because Horani males preferred [q]. Because [k] was highly stigmatised, neither Horani males nor females adopted it. Fallāḩi males used [g] more than females. Though [k] was stigmatised, it was adopted by Fallāḩi females more than males. This is in harmony with the results reported in Abdel-Jawad (1981) for Amman, and for very similar reasons: Fallāḩi females in Irbid had a low level of education and dense social networks (p. 329).

***Table 4.2**: Distribution of (q) variants by sex in the Horani and Fallāḩi groups (compiled from Table 9.11, p. 330; and Table 9.15, p. 333 in Al-Khatib (1988))*

Origin	**Sex**	**(q) variants**							
		[q]		[g]		[k]		[ʔ]	
		Number of tokens	%	Number of tokens	%	Number of tokens	%	Number of tokens	%
Horanis	Females	118	26	315	68	0	0	29	6
	Males	385	41	554	59	0	0	4	0
Fallaḩīn	Females	110	20	12	2	359	64	78	14
	Males	442	51	402	47	7	1	12	1

Al-Wer (1991) explored variation in (q) in the speech of women in three Jordanian towns: Salt (located 32 km to the north-west of Amman), Ajloun (located 77 km to the north-west of Amman) and Karak (located 138 km to the south of Amman). The social factors she investigated included age and education. The use of [q] was found to be highly correlated with education: the higher the speakers' educational level, the more [q] occurred in their speech, and the lower their educational level, the less they used [q]. In addition, it was found that the younger the speaker, the higher the use of [q]. Nevertheless, Al-Wer warned that it "would be inaccurate to interpret the increase in the use of [q] in the speech of the younger generation vis-à-vis the older generation as indicating a linguistic change in progress towards this variant" (p. 114), attributing [q] use to the high level of education of the young generation. Results also showed that [g], the local marker in the three towns explored, was the most used variant, especially among uneducated speakers, across all age groups. This shows that women in the three towns preferred to keep the variant that expressed their "local and ethnic identity" (Al-Wer, 1999, p. 54). In contrast, the infrequent non-local variant [ʔ] occurred the most in the speech of the youngest educated group, thus representing only a slight linguistic change, because the percentage of [ʔ] occurrence did not exceed 10%. This can be understood as a competition between the local/Jordanian/Bedouin [g] and the non-local/Palestinian/urban [ʔ] that started diffusing from Amman. This is attested by the fact that [ʔ] was not used by anyone in Karak, while it was used by two speakers from Ajloun and 5 speakers from Salt. This is in harmony with how far these towns are from Amman.

El Salman (2003) explored variation in (q) as used by first and/or second-generation Palestinian Fallaḩīn who migrated to Karak after the 1948 war. Variation in (q) was correlated with sex, age and education. Education was found to be very significant in triggering the use of [q] among middle-aged females, who used it as 26.2% of the total number of tokens (N=56). This is in contrast with the previous results reported by Abdel-Jawad (1981) and Al-Khatib (1988), in which males used [q] more than females. Because using [q] is highly correlated with education, El Salman's results may correlate with the spread of education among females through the 1980s and 1990s in Jordan. Regarding the [g] variant, it was used by young males the most (89.1%), which can be explained as a result of accommodating to the Jordanian identity, because most of the population in the area is drawn from Bedouin tribes whose traditional variant is [g] (p. 112). Accordingly, [g] was "the vehicle to be ridden so as to appear local" (p. 95). But the fact that middle-aged females used [g] more than middle-aged males (56.8 as against 46.9%) comes about because middle-aged males used the stigmatised variant [k] 40% of the time, while middle-aged females used it just 16.9% of the time. In this case, it could be claimed that middle-aged females used the identity marker [g] more as an innovation: Palestinian migrant females tended to accommodate to Jordanians first. El Salman also found age to be the most significant factor behind maintaining use of the stigmatised variant [k]: the older the speaker, the more [k] was used, and vice-versa (2003, p. 110). As for the non-local [ʔ], which is associated with "modernity and emancipation" (El Salman, 2003, p. 114), it was used by young females alone, showing the significance of the interaction between sex and age in triggering an innovation led by young females. Comparing the percentage (0%) of young females adopting [ʔ] in Karak in Al-Wer (1991) to that in El Salman (2003) (23%) shows that this variant rapidly diffused across Jordan.

Table 4.3: *Distribution of (q) variants by age and sex (compiled from Table 3.2, p. 76; Table 3.4, p. 95; Table 3.5, p. 103; and Table 3.6, p. 106 in El Salman (2003))*

Age	**Sex**	**(q) variants**							
		[q]		**[g]**		**[k]**		**[ʔ]**	
		Number of tokens	%	Number of tokens	%	Number of tokens	%	Number of tokens	%
Young	Females	33	14.9	106	47.9	29	13.1	53	23.9
	Males	29	10.8	238	89.1	0	0	0	0
Middle-aged	Females	56	26.2	121	56.8	36	16.9	0	0
	Males	36	13	129	46.9	110	4	0	0
Old	Females	29	11.1	11	7.5	219	84.5	0	0
	Males	29	8.7	19	5.7	283	85.4	0	0

Al-Wer examined (q) in Amman in her research project launched in 1998 using age, gender, ethnicity and context as independent factors. The age factor included participants representing three generations: the first generation came to Amman as migrants, the second generation was born in Amman or arrived young, and the third generation was born in Amman. The results, summed up in Al-Wer & Herin (2011), reveal that variation in (q) in Jordan started as a result of contact with urban Palestinians. It occurred first in the speech of Jordanian women and Palestinian men who came to reside in Amman in the late 1930s. The use of [ʔ] quickly diffused into female speech in Amman from the 1950s to 1970s and, thus, became associated with females. Then, it spread outside Amman to affect nearby towns first. After the 1970-1971 Palestinian-Jordanian confrontation the government in Jordan gave Jordanians more privileges (e.g. appointments to high-ranking jobs), which brought in a sense of distinctive Jordanian identity (for more details, see Al-Wer, 2007). Male Jordanians in Amman in particular may have felt under pressure to use the local variant [g] that symbolised Jordanian identity and came to be associated with males. Palestinians, especially males, living in Amman also converged on [g][25]. In the 1980s and 1990s, Amman developed a native population from the third generation and enjoyed social as well as political stability, and this led to a weakening of the significance of ethnicity in triggering a variant of (q). Switching from [g] to [ʔ] in female speech is very advanced, and may be complete and promoted by "regional koineisation" (Al-Wer & Herin, 2011, p. 74). [g] has not completely disappeared from Amman; it is still used, especially by males who use [g] and [ʔ] according to context: the first as a marker of Jordanian identity and the latter as a non-local marker. Outside Amman, although [g] is still the norm, [ʔ] is diffusing in many directions.

[25] Suleiman (2004) mentions that after the 1970-1971 confrontation between Palestinians and Jordanians in Amman, male Palestinian university students started using the Bedouin/Jordanian [g] rather than the urban/Palestinian variant [ʔ] or the rural/Palestinian variant [k] to accommodate to Jordanian soldiers who controlled the checkpoints on the way to the university (p. 115). Bassiouney (2009) also recounts a famous Jordanian joke that started in the aftermath of the confrontaion as follows: "Two young Palestinian men join the army. The military officer asks their names. The first one answers (*'ʔismi ʔa:sim'*, my name is *ʔa:sim* [for: Qa:sim]). When the military officer hears the glottal stop rather than the Bedouin Jordanian *g*, he says, 'You speak like a woman. You are now in the army and you must learn to speak like a man.' He then asks the second Palestinian his name. The second Palestinian replies, '*gaḥmad*'. Thus, the second Palestinian changed all his glottal stops into *g*s even in the words that should necessarily start with *ʔ* such as the name *ʔaḥmad*, 'Ahmad'" (p. 126).

4.4.1.1.2 Palestine

Abdel-Jawad (1987) investigated variation in (q) in the speech of 24 speakers from Nablus, Palestine, stratified according to sex, age and mobility. They were divided into two age groups: the young group (below 45) and the old group (above 45). Some of those participants were born and were still living in Nablus, while others were born in Nablus and then migrated to either Amman or Irbid in Jordan. The traditional variant of (q) in Nablus is [q]. Results showed that the young speakers (males and females) and old female speakers who left Nablus were leading the change by adopting the urban [ʔ] and that the most conservative speakers were males who remained in Nablus. This shows the contribution of gender and mobility to language change.

Bethlehem was a small village with a Christian majority until the 1948 war because of which many large Palestinian cities such as Jaffa and Haifa were incorporated into Israel. Palestinian refugees who lived in the then large cities fled to other areas. Bethlehem received a large number of refugees and grew into a large city with a Muslim majority. Amara, Spolsky & Tushyeh (1999) studied variation in (q) in Bethlehem and found that [q] was the variant most used by all age groups except the old speakers (over 50), who used the rural variant [k] the most. [q] was also used by males more than females and correlated with education: the higher the education level, the more it was used. This is due to the fact that [q] is also the Fuşḩā variant supported by schooling. As regards the Bedouin variant [g], it occurred the least across all the factors investigated: age, gender, education and religion. [ʔ], associated with urbanisation and softness and described as the Jerusalem Arabic (henceforth JA) variant, was used by females more than males, by those who had a higher level of tertiary education, and by Christians more than Muslims. However, the percentage of people using this variant was still lower than that of those using [q] and [k]. Based on this, Amara, Spolsky & Tushyeh concluded that "those with education beyond the secondary level are moving either towards the standard [variant [q]] or towards the urban variant [ʔ]" (1999, p. 69).

Cotter (2016) examined the effect of dialect contact on variation in (q) in Gaza. He studied this variable in the speech of 22 participants in terms of three social factors: gender (12 males and 10 females), age (3 age groups: 17-39, 40-64 and 65+) and dialect background (15 Gazans and 7 Jaffans, 5 of them born in Gaza). After the 1948 war, thousands of Palestinians who had lived in Jaffa (located 70 km north of Gaza) migrated to Gaza as refugees and finally settled there. Based on the dialectological evidence cited by Cotter, the variant of (q) in Gaza had been [ʔ] in the early 1910s before it yielded to [g] in the late 1970s, probably because of the Bedouin effect nearby. The Jaffan variant is [ʔ]. Results showed that the Gazan variant [g] was the dominant variant, as it accounted for 72% of the total number of tokens counted (N=575). Gender and dialect background were significant in motivating speakers to use [ʔ], while age was non-significant. Generally, female speakers used [ʔ] more than males, while male speakers tended to use [g] more, in harmony with the results reported for other speech communities (Abdel-Jawad, 1981; Al-Khatib, 1988; Haeri, 1997; El Salman, 2003). As regards the interaction between gender and dialect background, Gazan females used [ʔ] in 26% and Gazan males just 5% in the total number of tokens (N=377), while Jaffan females used [ʔ] in 96% and Jaffan males in 26% in the total number of tokens (N=198). This shows that while Gazan females prefer [ʔ] more consistently than do Gazan males, Jaffan males are more attached to [g] than females. These results also show that Jaffan migrants and probably migrants from other Palestinian cities have had a linguistic effect on the Gazan speech community. Though Cotter did not find age to be a significant factor in leading speakers to use the non-local variant [ʔ], the fact that the youngest Gazan age group (17-39 years old) used it in 30% in the total tokens (N=151) (p. 22) indicates that a linguistic change towards [ʔ] may be in the making.

4.4.1.1.3 Syria

Palva (1982) documented the diffusion of the variant [ʔ] supplanting the traditional variants of (q) in a number of Syrian towns and cities. He thought that Aleppo Muslims who predominantly used the variant [k] abandoned it and adopted [ʔ] because of the influence and prestige of the urban dialects used by Christian and Jewish communities, in which [ʔ] was a prominent feature. It should be mentioned here that this convergence did not occur because of religious factors since it occurred in the opposite direction: if Muslim speakers in Aleppo, or actually anywhere, wanted to keep one of the (q) variants, it would presumably have been [q] as it is the Fuṣḥā variant used in reading Muslim scripture.

Jassem (1987) explored the variation in (q) in an immigrant speech community in Damascus after they were expelled from the Golan Heights during the 1967 war. The variation in (q) was correlated with education, sex and age. The immigrants' variants of (q) include [g] and [dʒ], while the variant in DA is [ʔ]. Data was collected according to four styles: immigrant-immigrant (II), immigrant-local (and here 'local' means 'Damascene') (IL), wordlist and Qur'anic reading. Since the last two styles focused on variation in reading Fuṣḥā, they are disregarded here. Jassem's results showed that sex was a significant factor behind using [q], with males using it more than females. This is consistent with the results reported from Jordan (Abdel-Jawad, 1981; Al-Khatib, 1988). In the II style, with slight differences across all the educational levels, the male and female immigrants' own variant [g] was maintained, [dʒ] was generally abandoned, and the prestigious DA variant [ʔ] was minimally adopted. However, in the IL style, immigrants were generally under pressure and converged on Damascenes by adopting [ʔ], with females leading convergence more than non-educated males or those who had a low level of education. As regards age, old speakers were found to resist the DA variant [ʔ] the most and to use the Fuṣḥā variant minimally. Because of their low educational levels or being non-educated, old immigrants used their local non-standard variants [g] and [dʒ] instead of [q], the variant that is mostly acquired through schooling, and instead of [ʔ] that was adopted more by educated young females, especially in the IL style. As for young educated males, they maintained their traditional immigrant variants (p. 321), in harmony with Labov's two principles *I* and *Ia* (1990) (see section 3.2.5.1 for details).

Daher (1998) examined variation in (q) according to age, gender and education in Damascus. In DA, [ʔ] is the prestigious variant and [q] is a stigmatised one even though it is the Fuşḩā variant. Thus, [q] has different social values, carrying the prestige of Fuşḩā while being stigmatised as a spoken variant (as it is usually used by Syrian Bedouins or villagers). Daher focused on [q], which was being introduced into DA through lexical borrowings from Fuşḩā as a direct result of education. This is why Daher related men's higher use of [q] to their higher educational levels compared to those of women, claiming that education was "traditionally the domain for a small, male elite" (1998, p. 203). Women were found to avoid [q] because of its association with men and/or rural speakers and to adopt [ʔ] due to its association with urbanisation and modernisation. Finally, Daher concluded that men and women in Damascus had different norms: men considered [q] prestigious because it is the Fuşḩā variant, while women looked at it as a stigmatised variant.

Focusing on another migrant community, Habib (2008) investigated the variants of (q) as used by the first- and second-generation migrants from a Christian village to the city of Homs according to four social factors: social class (based on an index composed of family income, education, occupation and residential area), gender, age and residential area. The last factor included two districts in Homs: Al Hamidiyah, an old neighbourhood with a Christian majority whose (q) valiant is [ʔ] and Akrama, a new neighbourhood with a majority composed of rural migrants, mainly Alawites, whose variant is [q]. The migrants' variant of (q) is [q], while the Homs variant is [ʔ]. Results show that males used [q] more than females. Though this result is superficially the same as that reported in Abdel-Jawad (1981), Al-Khatib (1988), Jassem

(1987), Amara, Spolsky & Tushyeh (1999) and El Salman (2003), it is different here because [q] is not acquired through education as the Fuşḩā variant; rather, it is the migrants' local variant, which is stigmatised by the people of Homs. This result, however, is the same as that reported by Abdel-Jawad (1987), whereby [q] is the local variant in Nablus.

Results also revealed the significance of gender and residence in motivating rural migrants to Homs to adopt [ʔ]: females used the prestigious variant more than males, and the migrants in Al Hamidiyah converged on [ʔ] significantly more than those who lived in Akrama. Though age was not found to be significant on its own, the interaction between age and gender was significant and showed that old females converged on the Homs variant [ʔ] more than young females, who in turn converged on [ʔ] more than young males. Old males maintained their traditional variant [q].

4.4.1.2 North Africa

4.4.1.2.1 Algeria

Dendane (2013) examined variation in (q) in Tlemcen, Algeria, according to age and gender. In this speech community, the variant [ʔ] is a stigmatised variant mocked by Algerians from other cities and highly associated with females. The variant [g], on the other hand, is associated with males and is diffusing in Tlemcen because of the large number of rural migrants there. Dendane found that the young males, especially those between 10 and 20, avoided the use of [ʔ], converged on the migrants' variant [g] and sometimes hypercorrected while those of 50 and over maintained [ʔ]. As for women, they also maintained [ʔ] but had negative attitudes towards men using it. In a similar vein, Belhadj-Tahar (2013) investigated (q) in Tlemcen as well and found very similar results. These findings are different from those reported in many other speech communities in the Levant and Egypt (Schmidt, 1974; Abdel-Jawad, 1981; Jassem, 1987; Al-Khatib, 1988; Amara, Spolsky & Tushyeh, 1999; Habib, 2008) regarding the use of the variant thought to be non-standard/local by women more than men but are in harmony with those found by Al-Wer (1991) as regards the high use of the local variant [g] by women in Salt, Ajloun and Karak and by El Salman (2003) concerning the use of the stigmatised variant [k] by migrant Fallāḩi women in Karak.

4.4.1.2.2 Morocco

Hachimi (2007) studied variation in (q) among 15 women migrants from Fes to Casablanca, Morocco. Seven of these were born in Fes and lived in Casablanca for at least 17 years. The other eight participants were born to Fessi parents in Casablanca, where they lived all of their lives. The participants also represent different age groups and educational levels. There are two variants of (q) in Fes: [q] and [ʔ], and the Casablanca variant is [g]. Migration from Fes and other Moroccan cities to Casablanca started after the French authorities changed the latter to a commercial centre, thereby changing Casablanca from a small village to the biggest city in Morocco. The Casablancan dialect is an immigrant koine characterised by the dominance of rural features, and is considered "rural, non-prestigious and masculine" (Hachimi, 2007, p. 104) especially by Fessis. Results showed that all participants maintained the Fessi variant [q] in all lexical tokens except for the verb (qāl) '*to say*'. Four participants used only the Fessi variants: one used [ʔa:l] and three used [qa:l]. Another participant had variation between the Fessi [qa:l] and the Casablancan [ga:l], while the rest of the participants used the Casablancan form [ga:l] all the time. Hachimi explains this feature as a linguistic resource: by adopting the Fessi variant [q] in all words except in the verb (qāl), speakers distance themselves from pure Casablancans who use [g], and adopting the Casablancan variant [g] in this very frequent verb is another way for speakers to distance themselves from pure Fessis, who adopt [q] in realising the verb. It seems here that these Fessi women in Casablanca were trying to create a distinct identity, the inputs to which are both Fessi and Casablancan but whose output is a new identity: a mixture of Fessi (old urban) and Casablancan (new Bedouin). As regards [ʔ], it was used by one participant who was born in Fes, 70+ and uneducated.

4.4.2 Literature on EA

Schmidt (1974) examined (q) in CA in the speech of 28 participants, 16 students (8 males and 8 females) at the American University in Cairo (AUC) and 12 working-class males recruited from a coffee shop in As-Sayyida Zaynab (SZ), a working-class quarter in Cairo. He did not clarify, however, where his AUC students came from geographically or socially. In the 1970s, the AUC was not as prestigious as it is now and SZ had more middle-class residents than it does now. Schmidt focused on the contribution of education and sex to use of the Fuşḩā variant [q] or the CA variant [ʔ]. He incorporated four styles: A (spontaneous), B (careful), C (reading) and D (word list), and coined the term Q-colloquialisation to describe the realisation of /q/ as [ʔ], claiming that any word with an etymological /q/ might be realised as [ʔ], though he admitted that this rule "never applies" in some words like [qɑːhɪɾɑ] '*Cairo*' and [qʊɾʔaːn] '*Qur'an*' (p. 82). Schmidt found that the females, all of whom were AUC students, produced [q] less than males (whether educated or completely non-educated), in styles A and B. Regarding [ʔ], it was not used at all in styles C and D. In style A, however, [ʔ] was used at a very high rate by the three groups: 88% by AUC males, 89% by AUC females and 88% by SZ males; and in style B, [ʔ] was used the most by AUC females (81%), followed by SZ males (72%), and finally by AUC males (61%). The AUC males' low scores in using [ʔ] compared to AUC females and SZ males in style B is a result of the high occurrence of [q] in the speech of AUC males. This suggests that style has a big effect in triggering the use of a variant at the expense of another. It also suggests that the effect of sex (AUC males compared to AUC females) is larger than that of education (AUC males compared to SZ males) in triggering [q] and [ʔ]. This contradicts many studies (Jassem, 1987; Haeri, 1997; Daher, 1998; Amara, Spolsky & Tushyeh, 1999; El Salman, 2003) which showed that education positively correlates with using the Fuşḩā variant [q] and the urban variant [ʔ], as the first is acquired through schooling and the latter through mixing with people from different linguistic backgrounds in speech communities where it is associated with the values of being modern, urban, etc.

Haeri (1997) believed that "of all stylistic resources that are borrowings from Classical Arabic [Fuşḩā], the use of qaf lexical tokens [in CA] is by far the most prevalent," (p. 105). Hence, she decided to study the alternation between the use of [q] and [ʔ] in words where alternation/variation is possible in CA (e.g. [qaˈdi:m] or [ʔaˈdi:m] '*old*'). This alternation, according to her, does not include doublets such as [ˈqawi] '*strong*' and [ʔawi] '*very*', words that contain [q] but did not exist at the time when /q/ merged with /ʔ/, new coinages that have /q/ (e.g. [ˈqɑjzˤɑɾ] '*kaiser roll*' and [qɑˈna:l ʔɪsˈweɪs] '*Suez Canal*') (pp. 126-127) or highly frequent words that do not involve variation (e.g. [ˈʔalli] '*he said to me*'). Haeri concluded that the occurrence of [q] comes about not because of a structural rule but by lexical choice. The two social factors she examined are social class and gender. Haeri divided her participants into four social classes (lower middle class (LMC), middle middle class (MMC), upper middle class (UMC) and upper class (UC)), in accordance with a socio-economic class index composed of parents' occupation, speaker's education (whether he/she attended a private language school, a private Arabic school, or a public Arabic school), speaker's neighbourhood and speaker's occupation.

Results revealed that gender and social class played significant roles in motivating speakers to borrow words from Fuşḩā with [q]. Males were found to use [q] significantly more than females. Testing the contribution of gender and education to using [q] was also found to be significant: females used [q] significantly less than males even if both had equal levels of education. Social class was also significant, with the MMC in the lead, followed by the UMC, UC and finally LMC. MMC speakers used [q] more than UC and UMC speakers as a direct result of the type of education, not the level of education. This could be noticed in Haeri's social class index, which involved the type of school the speaker attended (private language, private Arabic or public Arabic). UC and UMC members in Cairo usually receive their education at private language schools and attend private universities where a foreign language is the main medium of instruction. Even at home, UC and UMC members may speak in English, French or another language, and Fuşḩā for them is very similar to a foreign language. LMC and MMC speakers, on the other hand, attend state schools and universities where Fuşḩā is the medium of instruction, and spoken Arabic at any level is the language of daily life. What Haeri did not mention is that members of the UC and UMC are mostly not practising Muslims; therefore, they do not memorise, read or listen to the Qur'an, do not perform prayers in which reading some portions of the Qur'an is required, and do not attend Friday sermons where *the language of heritage* (Badawi, 1972) (see details in 1.2.2) including the scripture (Qur'an and Ḩadīth) is used, etc. Hence, LMC and MMC members' relationship with Fuşḩā is much stronger than it is for UC and UMC members. Haeri also tested the contribution of education alone and found it significant, with those with a '*college'* level of education in the lead, followed by '*beyond college*', '*high school'* and finally '*no education'*. This may be because the '*beyond college*' participants belonged to the UMC and UC (see Haeri's appendix giving information on her participants on pp. 243-247), which do not have a strong relation with Fuşḩā, as clarified above. Why the LMC participants scored the lowest in using [q] may be because of their low levels of education. It seems here that education can explain the linguistic variation in using a variant of (q) better than can the social class index designed by Haeri.

In her study of female speech in Balyana, a small town in Sohag Governorate of Upper Egypt, Miller (2003) showed that females were far from being affected by CA. Regarding (q), she concluded that the Upper Egyptian variant [g] was, by and large, the dominant variant and that it had prestige among people living there, reporting testimonies that if an Upper Egyptian adopted CA, he/she would be negatively perceived by his/her family members and friends and regarded as "snobbish or effeminate" (p. 4).

Miller (2005) examined linguistic variation in 21 variables, including (q), among 7

Upper Egyptian migrants (from areas UE 1 and UE 2 in Sohag Governorate, see Map 1.2) living in Cairo. The participants' profiles show that Miller focused on many social factors: gender, age, educational level, the number of years spent in Cairo, age on arrival in Cairo, religion, and social network (see Table 4.4). It is clear that data collected from seven speakers does "not provide enough data for a quantitative analysis that … [can] clearly correlate variants with social profile" though it can "highlight some dominant trends" (Miller, 2005, p. 924).

The migrants' variants of (q) included [g] and [k]. Miller aimed at measuring how far those migrants accommodated to the CA variant [ʔ] and found that the two participants who adopted it the most were Speakers 4 and 5 (see Table 4.5). As is clear in Table 4.4, Speakers 4 and 5 went to Cairo when they were 15 and 8 respectively, and lived there for 35 and 32 years respectively. As shown in Speaker 4's profile (Miller, 2005, p. 925), he was a bike mechanic in Bulaq Ad-Dakrur, a working-class neighbourhood in Cairo. Such a job in such a place means that this speaker worked in an open shop on a street full of people and his customers either lived in the same neighbourhood or came from other neighbourhoods to have their bikes repaired by him. This certainly involved much contact and necessitated accommodation to CA. Otherwise, he would be dealt with as an Upper Egyptian, a description associated with a number

Table 4.4: *Participants' social profiles as reported in Miller (2005, pp.924-925 & p. 930)*

Social factor	**Speaker 1**	**Speaker 2**	**Speaker 3**	**Speaker 4**	**Speaker 5**	**Speaker 6**	**Speaker 7**
Gender	Male	Male	Male	Male	Female	Female	Male
Education	University	Secondary school	Secondary school	Primary school	Illiterate	Illiterate	Primary school
Age	25	39	22	50	40	38	50
Years in Cairo	7	22	0	35	32	10	20
Arrival age	21	18	just arrived	15	8	28	30
Religion	Muslim	Muslim	Muslim	Muslim	Muslim	Christian	Muslim
Social network [26]	semi-loose	semi-loose	dense	loose	loose	dense	dense

[26] This classification of social network (dense, semi-loose and loose) is based on the information provided in Miller (2005, pp. 924-925 & p. 930).

of offensive stereotypes (Miller, 2005; Rosenbaum, 2008). Furthermore, the man had stopped visiting his family in Upper Egypt a long time ago. As for Speaker 5, she was married to her cousin who was born in Cairo and, because her husband did not have a house in Upper Egypt, had not been there since she had married. The rest of speakers' convergence on CA [ʔ] percentage is in harmony with the number of years they spent in Cairo, except for Speakers 6 and 7 (see Table 4.5).

Table 4.5: *Percentage of the distribution of (q) variants by speaker in Miller (2005, p. 926)*

(q) variant	**Variation in (q)**						
	Speaker 1	**Speaker 2**	**Speaker 3**	**Speaker 4**	**Speaker 5**	**Speaker 6**	**Speaker 7**
[q]	9%	18%	0%	20%	0%	0%	8%
[ʔ]	50%	58%	0%	80%	93%	1%	2%
[g]	38%	24%	90%	0%	3%	96%	90%
[k]	3%	0%	10%	0%	4%	3%	0%
Total tokens	306	580	8	472	29	447	309

Though Speaker 6 lived in Cairo for 10 years, she hardly adopted [ʔ] and maintained the traditional variants [g] and [k]. This may be due to the fact that she lived in a building entirely occupied by members of the same Christian family who had little contact with Muslim neighbours and whose social life was organised by the Church. However, this result should be taken cautiously and not generalised. Speaker 6 came to Cairo when she was 28, did not work and was living with her Upper Egyptian family. Any Muslim woman in her position would maintain [g] and [k]. It is true that Speaker 7 had been in Cairo for 20 years, but he came to Cairo when he was 30 and he worked as a contractor for a firm whose workers were mostly Upper Egyptian. He also had strong connections with his relatives in Upper Egypt and had a house there. Hence, it is not strange that he maintained [k] and [g]. These results show that the age of arrival in Cairo and the type of social network were more significant in causing Upper Egyptian migrants' accommodation to CA [ʔ]. This is similar to the result reached by Kerswill (1994), who found that young immigrants from Strilelandet to Bergen, Norway, were able to converge on the Bergen speech to a significantly greater degree than were old immigrants. The results of the variant [q] are disregarded as they represent how far each speaker borrowed it from Fuşḩā, a topic beyond the aim of the study.

4.4.3 Observations on the literature

From the literature above, it is clear that in the Levant (Palestine, Jordan and Syria) and Egypt, the variants of (q) have very analogous associations and are socially correlated in similar ways. The Fuşḩā variant [q] has prestige only when it is used in the context of code-mixing between Fuşḩā and dialect and it is reappearing strongly in AA (Abdel-Jawad, 1981), CA (Haeri, 1991) and DA (Daher, 1998) via lexical borrowings from Fuşḩā. Its reappearance is positively correlated with education: the higher the speaker's educational level, the more it is used. It is also correlated with sex/gender, with males using it more than females. It should be mentioned here that all of these studies are now outdated. In CA, for example, the reappearance of [q] from Fuşḩā has largely dropped and Haeri's results (based on data collected in the late 1980s) has certainly changed and the situation may need re-visiting.

When [q] is used as a non-Fuşḩā variant, it is usually the variant used by speakers who do not have a high social status, as in Nablus (Abdel-Jawad, 1987) and Homs (Habib, 2008). In this case, it is usually maintained by old male speakers. In North Africa, on the other hand, the variants of (q) have different associations. [q] is the Fuşḩā variant but also the prestigious dialectal variant in Tunis and other Tunisian coastal cities (e.g. Bizerte, Sousse and Sfax) (Gibson, 2002), in Algiers (Boucherit, 2006), and Fes (Hachimi, 2007). These different associations/meanings show that (q) variants are indexically different from one speech community to another in the Arab World. Eckert (2008) claims that

> the meanings of variables are not precise or fixed but rather constitute a field of potential meanings – an *indexical field*, or constellation of ideologically related meanings, any one of which can be activated in the situated use of the variable (p. 453).

This is in harmony with the (q) variable, the meaning of which is not *fixed*; rather, it is *activated* differently in accordance with the different *ideologies* across the Arab World, especially between Mashreqi (Eastern) Arabic and Maghrebi (Western) Arabic.

The variant [k] is a low-status variant usually associated with either working-class Fallaḩīn or Bedouins. It is also correlated with age and education: old speakers, who are usually non-educated, generally maintain [k] (El Salman, 2003). [k] is also correlated with sex, with females, especially less educated ones, using it more than males thanks to their dense social networks and their low level of education (Abdel-Jawad, 1981; Al-Khatib, 1988). In the case of immigrants, [k] could be an identity marker often maintained by old speakers (El Salman, 2003).

As for [g], it is the variant generally associated with Bedouins. [g] is still the dominant variant across the Arab world, but has different associations. It could be a marker of identity, as it was in Jordan (Al-Wer, 1991; Al-Wer & Herin, 2011), or resistance to the variant [ʔ] sweeping across Upper Egypt (Miller, 2003) or even within Cairo (Miller, 2005). Because [g] is related to "toughness, manhood and masculinity" (Abdel-Jawad, 1981, p. 176) and is sometimes described as a "dry" or "heavy" variant (Miller, 2005, p. 917), it is usually adopted by males rather than females in speech communities where there is competition between [g] and [ʔ] (Abdel-Jawad, 1981; Dendane, 2013; Cotter, 2016).

[ʔ] is associated with urban life, modernisation, and femininity, and is sometimes the object of ridicule. In Mashreqi Arabic, it is usually correlated with education, sex/gender and age. The higher the educational level of the speaker, the more [ʔ] occurs in his/her speech. This holds true especially for young educated females, who often lead the change from [g] towards [ʔ] (Abdel-Jawad, 1981; Jassem, 1987; Al-Khatib, 1988; Al-Wer, 1991; El Salman, 2003; Cotter, 2016) or from [q] towards [ʔ] (Abdel-Jawad, 1987; Amara, Spolsky, & Tushyeh, 1999; Habib, 2008). This is due to the fact that education, especially beyond the basic-education stage, often involves mobility and fragmentation of the social network (Al-Wer, 2002a), and because

[ʔ] is considered "soft" and "elegant" (Miller, 2005, p. 917). In Maghrebi Arabic, the situation is quite the opposite: [ʔ] is stigmatised (Dendane, 2013; Belhadj-Tahar, 2013) and diminishing in frequency (Hachimi, 2007).

These observations are in harmony with those of Sallam (1980). Sallam analysed the interdialectal speech of 20 educated participants, drawn from an original pool of 40, from 5 countries (Egypt, Palestine, Jordan, Syria and Lebanon) where the (q) variants include [q], [ʔ], [g] and [k]. Though he relied on the frequency of (q) variants and linked this to social categories (e.g. age and sex), Sallam's quantification is open to criticism: if the same token occurred more than twice in the speech of any interlocutor, only the first three occurrences were counted (p. 90). Sallam's results showed that [q] was used by males more than by females, and was positively correlated with education. It was also used by middle-aged (35-50) speakers the most, a result which Sallam explained as an outcome of "their higher degree of specialization in certain fields of activity" (1980, p. 94). As for [g], it was used by males alone and by older speakers the most, and this was a way of showing "pride in their regional origins" (Sallam, 1980, p. 94). As mentioned before, [g] is originally a Bedouin variant. As for [k], it was used minimally by both males and females. Concerning [ʔ], it was used by females more than by males, by young speakers more than by middle-aged and then old speakers, and by urban speakers the most. Therefore, it was described as a marker of urbanisation and modernisation (Sallam, 1980, p. 93).

4.5. Research Questions and Hypotheses

According to the literature discussed above, it is clear that the prestigious variants of (q) diffuse outside the focal urban areas from where they originated towards nearby regions first and then remote regions, as is the case in Karak (Al-Wer, 1991; El Salman, 2003). They are converged on by those who migrate to these areas, as is the case in Damascus (Jassem, 1987) and Cairo (Miller, 2005). If the migrants' variant(s) are more prestigious, native residents start to converge on them, as is the case in Gaza (Cotter, 2016). In Egypt, the prestigious variant of (q) is [ʔ].

The present study is an attempt to answer the following research questions:

1. Has the CA variant [ʔ] diffused to Minya?
2. If so,
    a. Do [ʔ] and the traditional MA variant [g] co-exist or has the first supplanted the second?
    b. How much are MA speakers accommodating to the CA variant [ʔ]?
    c. Who in Minya is converging on [ʔ], and who is diverging away from it, in terms of gender, age, education and place of residence?
    d. Why are MA speakers converging or diverging? Are the reasons similar to or different from those given in the literature?
    e. Does any linguistic factor promote convergence on the CA [ʔ]? The linguistic factors of interest here are style, the sounds preceding and those following the variant of (q).
3. What are the associations that people have with [ʔ] and [g] in Minya? And are these associations similar to or different from those reported in the literature?

It is hypothesised that the CA variant [ʔ] has diffused to Minya, and that it is gaining ground at the expense of the traditional variants of (q). This may be because of the spread of education in Minya (see section 2.4.4), especially among young females in urban centres and the countryside. This leads to the hypothesis that the adoption of the CA variant [ʔ] is led by young, highly-educated females either born in urban centres or in contact with urban centres.

4.6 Results

4.6.1. CA and MA variants of (q) by social and linguistic factors

Data was collected from 62 participants. Analysing the data yielded 4064 tokens, with a mean of 65.56 tokens per participant. Before presenting the statistically-obtained results, the distribution of the two variants, MA [g] and CA [ʔ], by social and linguistic predictors is given in Table 4.6.

Table 4.6*: Distribution of the variants of (q) by social and linguistic predictors*

Social and linguistic factors			Frequency			%	
			[g]	**[ʔ]**	**Total**	**[g]**	**[ʔ]**
Social factors	**Age**	young	546	1606	2152	25.40	74.60
		middle-aged	584	592	1176	49.60	50.40
		old	336	400	736	45.60	54.40
	Gender	females	616	1406	2022	30.50	69.50
		males	850	1192	2042	41.60	58.40
	Education	secondary or below	636	392	1028	61.80	38.20
		university	730	1303	2033	35.90	64.10
		postgraduate	100	903	1003	9.90	90.10
	Place of residence	villager	956	541	1497	63.90	36.10
		migrant	112	327	439	25.60	74.40
		urbanite	398	1730	2128	18.80	81.20
Linguistic factors	**Style**	careful	136	374	510	26.67	73.33
		casual	1330	2224	3554	37.42	62.58
	P**receding_sound**	consonant	154	466	620	24.84	75.16
		pause	468	610	1078	43.41	56.59
		vowel	844	1522	2366	35.67	64.33
	F**ollowing_sound**	consonant	271	542	813	33.33	66.67
		pause	133	259	392	33.93	66.07
		vowel	1062	1797	2859	37.15	62.85

Table 4.6 shows that the CA variant was

- used by the young the most, followed by the old and finally by the middle-aged;
- used by females more than males;
- used by postgraduates more than university students/graduates and by the latter more than by those who have a secondary-education level or below, including the non-educated;
- used by urbanites the most, followed by rural migrants and finally by villagers;
- used in the careful style more than the casual one;
- triggered most often when the environments preceding the variants of (q) are consonants, with preceding vowels favouring the use of the CA variant somewhat

less than this, and a preceding pause being the environment least likely to trigger its use; and

- triggered most often when the environments following the variants of (q) are consonants or pauses, with following vowels being the environment least likely to trigger its use.

6.4.2 Interactions between social factors

Since the hypothesis of the study is that convergence on CA is led by young, highly-educated females in town (either born in town or rural migrants to any urban centre in Minya), there could be interactions between the four social factors of interest: age, gender, education and place of residence. As is clear in Table 4.7 and plotted in Figure 4.2, in which interactions are shown between age and gender, age and education, age and place of residence, gender and education, gender and place of residence, and education and place of residence, there is a significant interaction between every two predictors. This means that the six interactions should

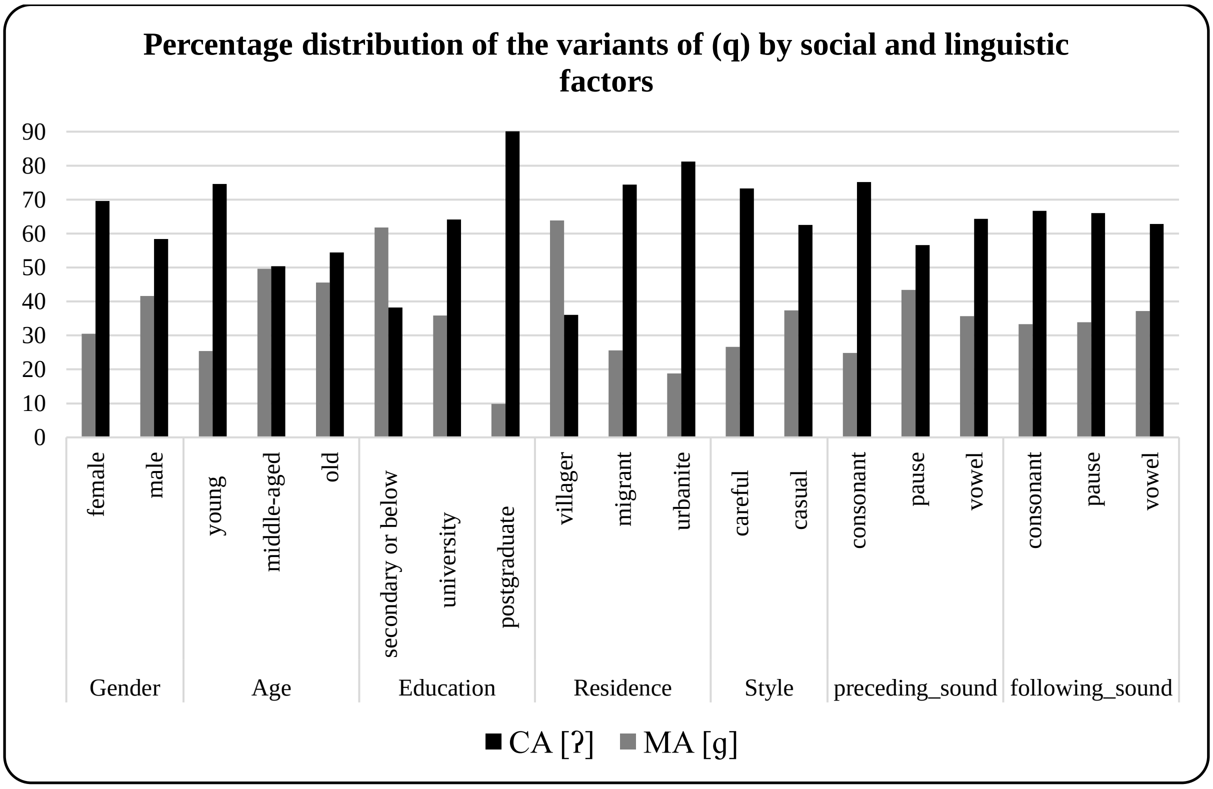


Figure 4.1: *Percentage distribution of the variants of (q) by social and linguistic factors*

***Table 4.7**: Interactions between the social factors of interest in convergence on CA [?]*

Interaction			Frequency			%	
			MA	CA	Total	MA	CA
Age*gender	female	young	307	1098	1405	21.85	78.15
		middle-aged	180	99	279	64.52	35.48
		old	129	209	338	38.17	61.83
	male	young	239	508	747	31.99	68.01
		middle-aged	404	493	897	45.04	54.96
		old	207	191	398	52.01	47.99
Age*education	young	secondary or below	72	95	167	43.11	56.89
		university	449	942	1391	32.28	67.72
		postgraduate	25	569	594	4.209	95.79
	middle-aged	secondary or below	263	96	359	73.26	26.74
		university	246	359	605	40.66	59.34
		postgraduate	75	137	212	35.38	64.62
	old	secondary or below	301	201	502	59.96	40.04
		university	35	2	37	94.59	5.405
		postgraduate	0	197	197	0	100
Age*place of residence	young	villager	313	382	695	45.04	54.96
		migrant	40	174	214	18.69	81.31
		urbanite	193	1050	1243	15.53	84.47
	middle-aged	villager	388	157	545	71.19	28.81
		migrant	72	153	225	32	68
		urbanite	124	282	406	30.54	69.46
	old	villager	255	2	257	99.22	0.778
		urbanite	81	398	479	16.91	83.09
Gender*education	female	secondary or below	271	197	468	57.91	42.09
		university	313	656	969	32.3	67.7
		postgraduate	32	553	585	5.47	94.53
	male	secondary or below	365	195	560	65.18	34.82
		university	417	647	1064	39.19	60.81
		postgraduate	68	350	418	16.27	83.73
Gender*place of residence	female	villager	405	164	569	71.18	28.82
		migrant	0	91	91	0	100
		urbanite	211	1151	1362	15.49	84.51
	male	villager	551	377	928	59.38	40.63
		migrant	112	236	348	32.18	67.82
		urbanite	187	579	766	24.41	75.59
Education*place of residence	secondary or below	villager	375	16	391	95.91	4.092
		migrant	38	6	44	86.36	13.64
		urbanite	223	370	593	37.61	62.39
	university	villager	549	445	994	55.23	44.77
		migrant	29	96	125	23.2	76.8
		urbanite	152	762	914	16.63	83.37
	postgraduate	villager	32	80	112	28.57	71.43
		migrant	45	225	270	16.67	83.33
		urbanite	23	598	621	3.704	96.3

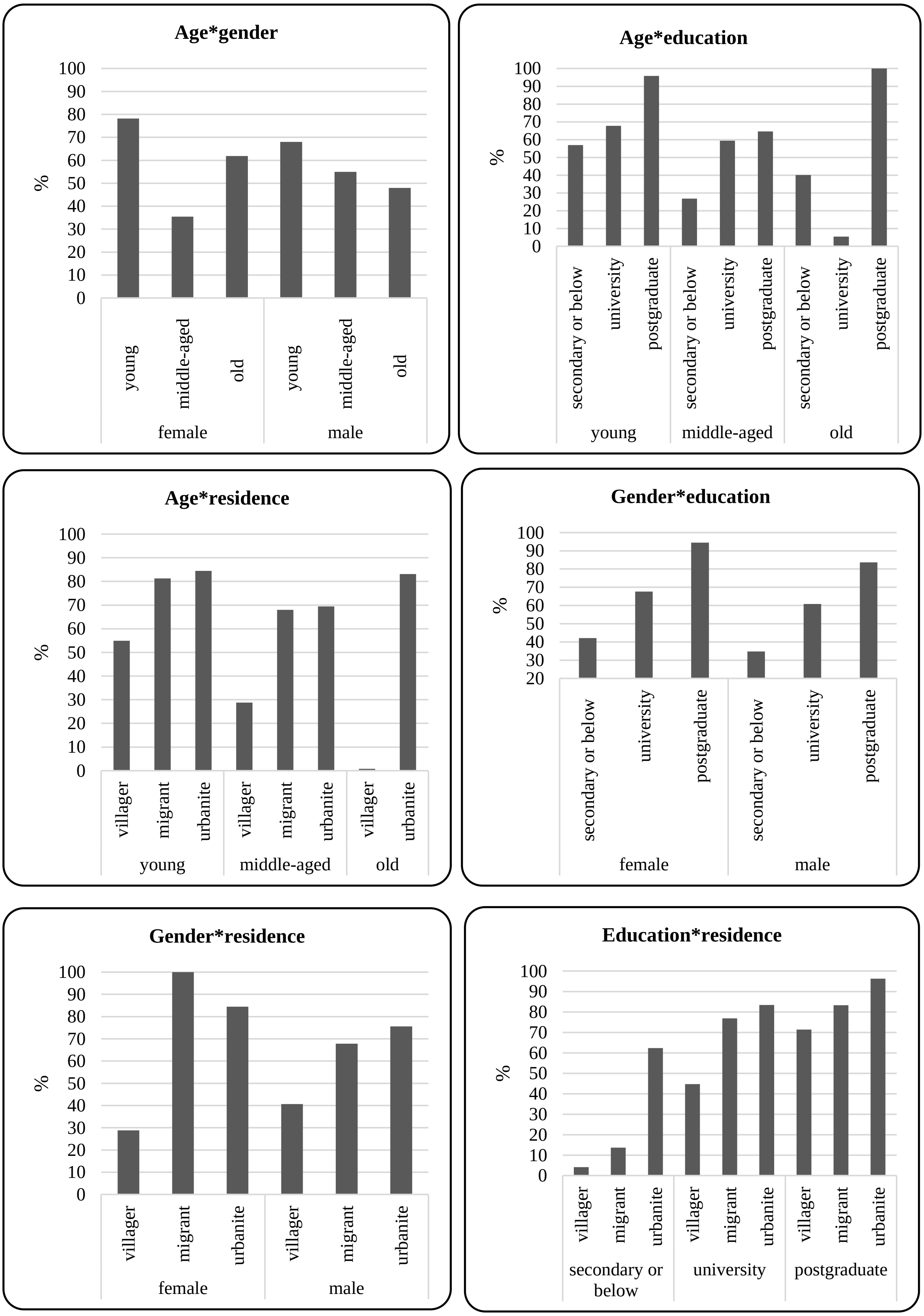


Figure 4.2: *Interactions between the social factors of interest in convergence on CA [ʔ]*

ideally be included in any maximal model. Regarding the linguistic factors, none of them is hypothesised to have any effect on convergence on the CA variant [ʔ].

4.6.3 Protocol of statistical analysis and model selection

The protocol of statistical analysis and model selection that was used relied on the following three steps: 1) structuring fixed and random effects, 2) designing the maximal model and 3) selecting the best fit (model) to explain the variance in the data.

In the analysis of the (q) dataset, mixed-effects maximal logistic regression analysis (see section 3.3.4) was carried out via the *glmer* function in the *lmer* package (Bate, Maechler, Bolker & Walker, 2015) in R (R Project for Statistical Computing, 2015). The regression analysis was designed to gauge the contribution of social and linguistic factors to the probability of using the CA variant [ʔ]. To carry this out properly, the following steps were followed in order: 1) structuring fixed and random effects, 2) designing the maximal model, and 3) selecting the best fit (model) to explain the variance in the data. These steps were adapted from Baayen (2008), Zuur, Ieno, Walker, Saveliev, & Smith (2009), Barr, Levy, Scheepers, & Tily (2013), and Winter (2014) as summed up in Al-Hashmi (2016).

6.4.3.1 Structure of fixed and random effects

The fixed social effects tested in the (q) dataset are those of interest here: `age`, `gender`, `education` and `residence`. Any effect is alphabetically levelled in R, unless it is re-levelled. So, if `gender` has two levels (`male` and `female`), `female` is the default/reference level to which `male` is compared, with `female` having the 0 value. The levels of the effects investigated here are as follows:

- `gender`: `female` (the default level) and `male`.
- `age` is an ordinal variable, meaning that an old person was previously middle-aged and young before that; thus, `age` was re-levelled as `young` (the default level), `middle-aged` and `old`.

- `education` is also an ordinal variable and, therefore, was re-levelled as `secondary or below` (the default level), `university` and `postgraduate`.
- `residence` is another ordinal variable because migrants are originally villagers; thus, `residence` was re-levelled as `villager` (the default level), `migrant` and `urbanite`.

The fixed linguistic effects include `style` and `sounds preceding` and `following` the target variant of (q). These effects have the following levels:

- `style`: `careful` (the default level) and `casual`.
- `preceding_sound` and `following_sound`: `consonant` (the default level), `pause` and `vowel`.

All the social factors are *between-speaker* and *within-item*; namely, they do not vary within the same speaker but vary within the same item. For example, no speaker can be male and female at the same time, while male and female speakers may use the same item. The same applies to the other social factors (`age`, `education` and `residence`). Likewise, all the linguistic factors except `style` are *between-item* and *within-speaker*; that is, they do not vary within the same item but vary within the same speaker. Consequently, no sound can be a consonant and vowel at the same time. A pause means that the target variant (i.e. CA [ʔ] or MA [g]) is used at the start of end of an utterance; thus, a pause cannot be a vowel or consonant at the same time either. In contrast, a consonant preceding and/or following the target variant of (q) can be used by young, middle-aged and old speakers at the same time. `Style` alone is *within-speaker* and *within-item*; careful and casual styles can be used by villagers and urbanites at the same time and the same item can be used in the two styles.

The random effects in the (q) dataset include `item` and `speaker`. To check the variance in the two random effects, a null model including only the intercept/constant was fitted and its results in Table 4.8 show that the variance in the dataset is attributed to `speaker` much more than `item`. The `item` intercept variance is estimated at 22.38 and the `speaker` intercept variance is 268.67. The total variance is 22.38 + 268.67 = 291.05. The variance partition coefficient (VPC) (Steele, 2008) for `item` is 22.38/291.05 = 0.076 and for `speaker` is 268.67/291.05 = 0.923, which indicates that about 7.7% of the variance in the response variable can be attributed to `item` and about 92.3% to `speaker`. These results show that both `item` and `speaker` have > 0 values, thereby confirming the necessity of including them as random effects in the maximal model.

***Table 4.8**: Summary of the null model testing the variance in the random effects in the (q) dataset*

Intercept	Variance	Total variance	VPC	Observations	Speakers	Items
item	22.38	291.05	7.7%	4064	62	1309
speaker	268.67		92.3%			

4.6.3.2 Designing the maximal model

The (q) was analysed via mixed-effects maximal logistic regression analysis. This kind of analysis can be fitted through random-intercept models or random-slope models. A random-slope model is also called a maximal model, which includes the fixed effects with all interactions justified by the hypotheses and random slopes only or random slopes and random intercepts to account for variability in a maximal way. The advantage of such maximal models is that they avoid the Type I errors that are frequent in the random-intercept models, errors that tend to exaggerate significance (Winter, 2014). The problem with maximal models occurs when they include many fixed effects with a lot of interactions, random intercepts and random slopes, especially if the dataset is small. In this case, these models probably do not converge (i.e. yield any results). To solve this problem, Barr, Levy, Scheepers, & Tily (2013) suggest some procedures, which are explained in detail in section 3.3.5.4.1. These procedures were taken into account when designing the maximal models for the (q) dataset, which included:

- All the fixed effects of interest: `gender`, `age`, `education`, `residence`, `style`, `preceding_sound` and `following_sound`.
- All possible interactions between the fixed effects as justified by the hypothesis explained above: `age:gender`, `age:education`, `age:residence`, `gender:education`, `gender:residence` and `education:residence`;
- All random effects, random intercepts and random slopes[27]: `(1 + style + preceding_sound + following_sound | speaker)` and `(1 + age + gender + education + residence + style| item).`
- To simplify the models so that they could deal with anticonservative and non-convergence issues, the number of iterations was increased to `2e5` through adding `(control=glmerControl(optCtrl=list(maxfun=2e5)).`

The model structure above led to the following three maximal models:

```
Max.qaaf <- glmer (convergence ~ age + gender + education + residence +
age:gender + age:education + age:residence + gender:education +
gender:residence + education:residence + style + preceding_sound +
following_sound + (1 + style + preceding_sound + following_sound | speaker)
+ (1 + age + gender + education + residence + style| item), data=kallim,
family='binomial', control =glmerControloptimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

Because of the large number of observations in the (q) dataset, the maximal model designed above was expected to work with no problems, but this expectation proved wrong, as shown below.

4.6.3.3 Selecting the best model to explain the variance in the data

Because the maximal model designed above did not yield any results, many other models had to be fitted. To obtain the best fit, the `dropterm` and `update` functions in the

[27] The structure of random slopes above is based on advice given in Baayen (2008), who recommends that “predictors tied to subjects (age, sex, handedness, education level, etc.) may require by-item random slopes, and predictors related to items (frequency, length, number of neighbors, etc.) may require by-subject random slopes” (p. 290).

MASS package (Venables & Ripley, 2002) were used to reduce and update models after removing the factor with the highest `Pr(Chi)`. Once the last reduced model (with only significant factor/s) was reached, the maximal model was compared to the reduced model via the `anova` function in the `car` package (Fox & Weisberg, 2011) to check which was a better fit. Another comparison was done via the `somers2` function in the `Hmisc` package (Harrell, Dupont, et al., 2016) to make sure that the `anova` results were right. The `somers2` function is a "rank correlation between predicted probabilities and observed responses" (Baayen, 2008, p. 224), and it is recommended by Tagliamonte (2011) to compare between different models. The model with the highest C value is the one with the highest level of fit.

4.6.4 Statistical results

The maximal model `Max.qaaf` designed above was fitted but it did not yield any results. Therefore, it was simplified by fitting different models. First, interactions were removed one after the other until all were removed, while keeping the 8 random slopes, but no model (from `Max.qaaf.1 to Max.qaaf.6)` converged (see details in Appendix 4).

Then, model `Max.qaaf.6` was re-fitted by removing the random slopes one after another until the model with the slope of interest `(1+education|item)`, model `Max.qaaf.13,` with no interactions at all, worked. Then, the interaction between age and gender (`age*gender`) was added and the model, `Max.qaaf.14`, worked. Another interaction was added (`education*residence`) and the model also worked. A third interaction (`age*education`) was added, but the model did not work. The third interaction was replaced by all the other interactions but no model with more than two interactions and one random slope worked. The interactions between `age*gender` and `education*residence` were kept as these are the theoretically most important ones, as justified by the hypothesis and literature. The last model, `Max.qaaf.15,` was considered the maximal model. Its results are reported below.

```
Max.qaaf.15 <- glmer (convergence ~ age*gender + education*residence +
style + preceding_sound + following_sound + (1 | speaker) + (1 + education
| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

The results in Table 4.9 show that convergence on CA [ʔ] is attributable to both social and linguistic factors. `Age`, `gender`, the interaction between `age` and `gender` and that between `education` and `residence`, are all non-significant, while `education` and `residence` have significant effects. All the linguistic factors are significant. As for `education`, there is a positive correlation between educational level and convergence on CA [ʔ]: the higher the educational level, the higher the convergence. This is clear from the estimates of the three levels: `secondary or below` has the default estimate `0`, `university` has a positive estimate `8.6098` and `postgraduate` also a positive estimate `17.3145`. Both `university` and `postgraduate` are significantly different from `secondary or below`, as confirmed by their respective p-values: `0.016618`* and `0.006369`**.

Table 4.9: *Contribution of social and linguistic factors to the probability of MA speakers' convergence on CA [ʔ] in model* `Max.qaaf.15`

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**	
(Intercept)	-6.0142	3.6967	-1.627	0.103751	
agemiddle-aged	-7.2027	4.1051	-1.755	0.079335	.
ageold	-1.8566	3.9279	-0.473	0.636455	
gendermale	-1.9674	2.5173	-0.782	0.434481	
educationuniversity	8.6098	3.5949	2.395	0.016618	*
educationpostgraduate	17.4996	6.4144	2.728	0.006369	**
residencemigrant	7.3145	7.2263	1.012	0.311442	
residenceurbanite	14.5534	4.2896	3.393	0.000692	***
stylecasual	-2.7199	0.3309	-8.221	< 2e-16	***
preceding_soundpause	-1.2833	0.3785	-3.390	0.000698	***
preceding_soundvowel	-0.4241	0.3231	-1.312	0.189392	
following_soundpause	1.5744	0.4374	3.599	0.000319	***
following_soundvowel	1.4737	0.3821	3.857	0.000115	***
agemiddle-aged:gendermale	8.3663	4.8969	1.708	0.087547	.
ageold:gendermale	-0.3641	5.1398	-0.071	0.943519	
educationuniversity:residencemigrant	-0.8168	9.7665	-0.084	0.933347	
educationpostgraduate:residencemigrant	-9.7417	9.6239	-1.012	0.311427	
educationuniversity:residenceurbanite	-5.3977	4.8086	-1.123	0.261641	
educationpostgraduate:residenceurbanite	-11.7416	7.6810	-1.529	0.126347	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Regarding `residence`, there is another positive correlation between convergence on CA [ʔ]

and urban life: the more time a speaker has spent in town, the higher the convergence, with urbanites (born and living in town) leading the convergence, followed by migrants and finally by villagers. This is clear from the positive estimates of `migrant`, `7.3145`, and `urbanite`, `14.5534`, compared to the default estimate, `0`, of `villager`. While the difference between villagers and migrants is not significant, that between villagers and urbanites is highly significant, as confirmed by the p-value `0.000692***`.

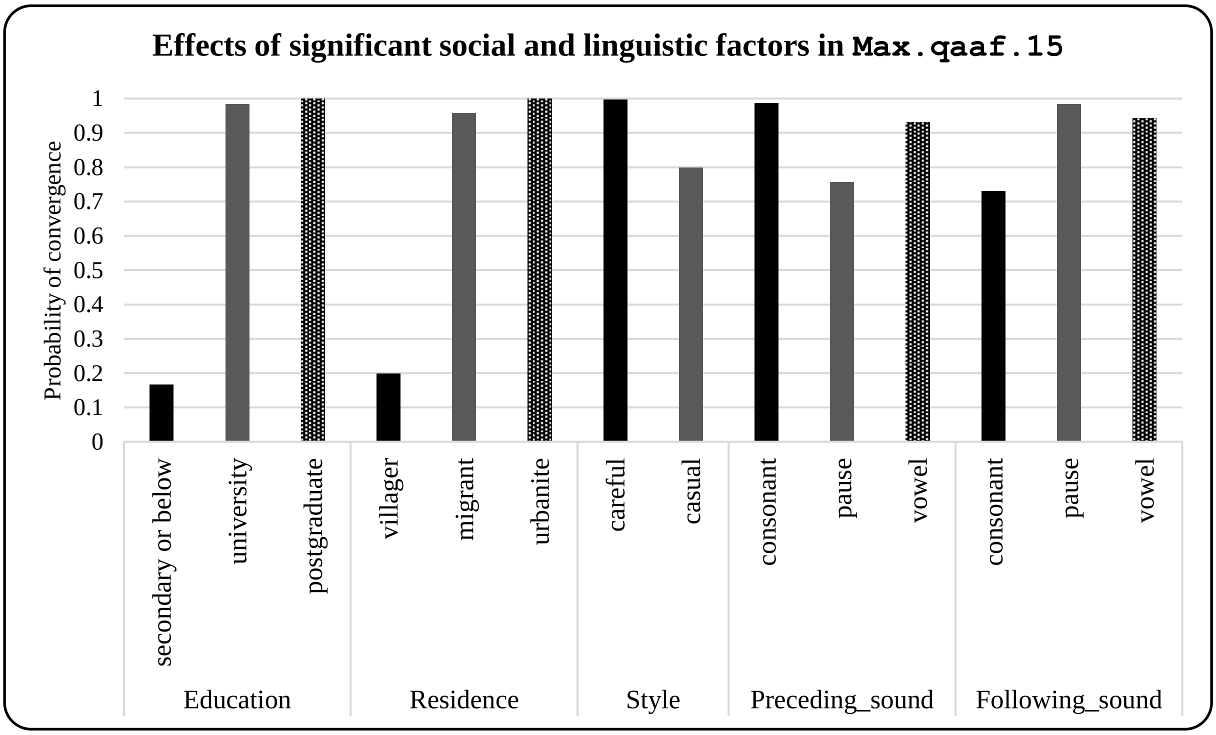


Figure 4.3*: Effects of significant social and linguistic factors in model `Max.qaaf.15`*

`Style` also plays a big role in convergence on the CA [ʔ]. The `careful` style triggers convergence much more than the `casual` one, thereby implying that greater attention paid to speech helps MA speakers to converge more successfully. This is evident from the negative estimate of the `casual` level at `-2.7199` compared to the default estimate, `0`, of the `careful` level. The difference is highly significant, as established by the high p-value `2e-16***`. In a similar way, both the sounds preceding and following the target variant of (q) affect convergence significantly, though differently. `Pauses` preceding (q) trigger the use of the CA [ʔ] less than vowels and much less than consonants, as is clear in their respective estimates: -1.2833, -0.4241 and 0. The difference between vowels and pauses is not statistically significant, while that between pauses and consonants is significant, as confirmed by the p-value 0.000698***. On the other hand, pauses following (q) trigger the use of CA [ʔ] more than vowels and much more than consonants. This is clear in their respective estimates 0, 1.5744, 1.4737 and 0. The differences between consonants and pauses and consonants and vowels are all significant, as confirmed by their respective p-values: 0.000319*** and 0.000115***.

To get the best fit, the dropterm and update functions were used to reduce the maximal mode, Max.qaaf.15. The (q) dataset required running the dropterm function 4 times and updating the model 4 times, from Redu.qaaf.1 to Redu.qaaf.4. The results of all models are given in detail in Appendix 3. The results of the last model Redu.qaaf.4, which tests the effects of education + residence + style + preceding_sound + following_sound + (1 | speaker) + (1 + education | item), are given in Table 4.10.

Table 4.10: *Contribution of significant factors to the probability of MA speakers' convergence on CA [ʔ] in model Redu.qaaf.4*

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**
(Intercept)	-7.3143	2.2699	-3.222	0.001271 **
educationuniversity	8.2926	2.2264	3.725	0.000196 ***
educationpostgraduate	10.0536	2.7108	3.709	0.000208 ***
residencemigrant	6.3316	3.9857	1.589	0.112157
residenceurbanite	10.6913	2.0143	5.308	1.11e-07 ***
stylecasual	-2.7157	0.3305	-8.217	< 2e-16 ***
preceding_soundpause	-1.2852	0.3785	-3.395	0.000686 ***
preceding_soundvowel	-0.4270	0.3231	-1.322	0.186247
following_soundpause	1.5747	0.4376	3.598	0.000320 ***
following_soundvowel	1.4742	0.3828	3.851	0.000117 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

Comparing the results of the maximal model, Max.qaaf.15, in Table 4.9 with those of the reduced model, Redu.qaaf.4, in Table 4.10 shows the same social correlations: the higher the educational level (education), and the more time a speaker has spent in town (place of residence), the greater his/her convergence on CA [ʔ] in Minya. The results of the linguistic factors in the two models are also highly analogous: pauses preceding (q) trigger the use of the CA [ʔ] less than vowels and much less than consonants, whereas pauses following the variable trigger [ʔ] more than vowels and much more than consonants.

```
anova(Max.qaaf.15, Redu.qaaf.4)
Data: qaaf
Models:
Redu.qaaf.4:  convergence  ~  education  +  residence  +  style  +  preceding_sound    +
            following_sound + (1 | speaker) + (1 + education | item)
Max.qaaf.15: convergence ~ age*gender + education*residence + style + preceding_sound
            + following_sound + (1 | speaker) + (1 + education | item)
             Df    AIC    BIC  logLik deviance Chisq Chi Df Pr(>Chisq)
Redu.qaaf.4  17 1174.5 1281.8 -570.25   1140.5
Max.qaaf.15  26 1188.4 1352.5 -568.21   1136.4 4.067      9     0.9069
```

The two models were compared via the `anova` function and the results below show that the reduced model is better because of its smaller AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion). Then, the two models were compared via the `somers2` function and the results also confirm that the reduced model is a better fit because of its bigger C and Dxy values.

```
probs = 1/(1+exp(-fitted(Max.qaaf.15)))
somers2(probs, as.numeric(qaaf$convergence)-1)
      C            Dxy          n          Missing
   0.9733579    0.9667158  4064.0000000  0.0000000
probs = 1/(1+exp(-fitted(Redu.qaaf.4)))
somers2(probs, as.numeric(qaaf$convergence)-1)
      C           Dxy          n          Missing
   0.993339    0.986678    4064.000000    0.000000
```

4.7 Conclusion

Based on the results presented above, it is clear that features of CA have diffused to MA. In particular, the CA variant [ʔ] has replaced the MA traditional variant [g] to a considerable extent. However, this does not mean that the first has completely supplanted the second; rather, they co-exist. [ʔ] has been adopted by highly-educated speakers and urbanites, while [g] has been widely maintained by those with low levels of education, and villagers. This means that adopting [ʔ] in Minya seems to rely on the speaker's degree of education and urbanisation: the higher the educational level of speakers and the more time they have spent in town, the more [ʔ] is used. No interaction, either between age and gender or education and place of residence, is significant in triggering convergence on [ʔ].

The linguistic factors also have a role in constraining the variation. The results show that consonants preceding (q) trigger the use of [ʔ] more than do pauses and vowels, and that pauses following (q) trigger [ʔ] more than do consonants and vowels. The careful style also triggers the use of [ʔ] significantly more than the casual style.

Why are education and place of residence significant factors in motivating MA speakers to favour the CA variant [ʔ] at the expense of their traditional variant [g]? Why do some linguistic factors trigger the use of [ʔ] more than others? What are the speakers’ associations with [ʔ] and [g], based on the results and participants’ views? How are these results similar to or different from those reported in the literature? All these questions will be dealt with in Chapter 7.

Chapter Five: (KaLLiM), (XaLLiF) and (WaSSaL)

5.1 Introduction

Compared to consonantal variation, vocalic variation in Arabic has received very little attention, despite the fact that it is extensive. This chapter fills a gap in this regard. Here, there is a focus on variation in EA vowels in general, and between CA and MA vowels in particular. The main aim is to examine how MA speakers diverge from some MA vowel patterns and converge on the counterpart patterns in CA. This chapter begins with a general introduction to Arabic and EA vowels. It then delves into the narrow literature on vocalic variation in some Arabic-speaking speech communities before discussing convergence from MA on CA vowels, which is discussed in detail: we deal in turn with vocalic variation in both dialects, the research hypotheses, data analysis and results.

5.2 Vowels in Arabic

5.2.1 Fuṣḥā vowels

As a Semitic language, Arabic has a rich system of consonants and a reduced system of vowels that was first described by Ibn Jinni (died 1002) in his *al-Khaṣā'iṣ* '*Distinctions*' (Embarki, 2013). The system that Ibn Jinni described is still the current Fuṣḥā system that includes close front /ɪ/ and /iː/, high back /ʊ/ and /uː/ and open central /a/ and /aː/. Nevertheless, this system of six vowels exhibits many allophones showing strong variation that is determined by "the linguistic context, prosodic position, and geographical origin of the speakers" (Embarki, 2013, p. 28). In addition, Fuṣḥā has two diphthongs: /aj/ and /aw/, formed by the combination of /a/ with /j/ and /w/. All vowel phonemes have emphatic/pharyngealized allophones when they are preceded or followed by emphatics (/sˁ/, /dˁ/, /tˁ/ and /ðˁ/), with low vowels like /a/ affected by pharyngealization more than high vowels like /i/ and /ʊ/, and short vowels more than long ones (Barkat, 2006, pp. 670-671).

In Arabic dialects, the number of vowels differs considerably. In Iraqi Arabic, for instance, the vocalic inventory contains five short vowels: /ɪ/, /ʊ/, /a/, /e/ and /o/, and five long ones: /iː/, /uː/, /aː/, /eː/ and /oː/ (Al-Ani, 2006). Iraqi Arabic /eː/ and /oː/ are respectively monophthongs formed from the two Fuṣḥā glides /ay/ and /aw/ that have been preserved in two Jewish dialects in Aqrah and Sandor and in Tikrit, all located in the north of Iraq (Jastrow, 2006). Words like [bayt] '*house*' and [lawn] '*colour*' in these dialects are [beːt] and [loːn] elsewhere in Iraq. As in Fuṣḥā, vowels in dialects exhibit many allophones.

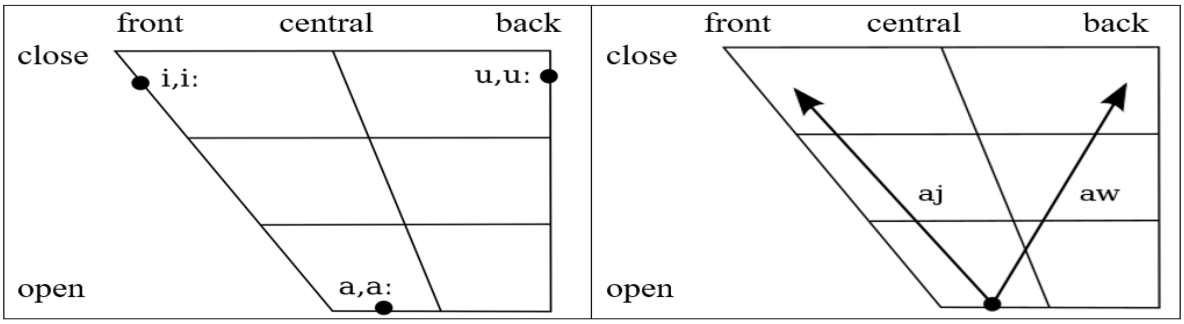


Figure 5.1: *Vowels and glides in Fuṣḥā (adapted from Thelwall & Sa'Adeddin, 1990, p. 38)*

5.2.2 Vowels in EA

Most studies that have described EA vowels have focused on CA vowels alone (Gairdner, 1925; Mitchell, 1956; Harrell, 1957; Borselow, 1976; Abdel-Massih, Abdel-Malek, & Badawi, 1979, among others). To the best knowledge of the researcher, the only work that has surveyed EA vowels, among other linguistic features, is Behnstedt & Woidich (1985), in which the vowels of sedentary (rural and urban) and Bedouin varieties are mapped as including five short vowels (/i/, /e/, /a/, /o/ and /ʊ/), five long vowels (/iː/, /eː/, /aː/, /oː/ and /uː/) and many glides composed from a vowel joined to /j/ or /w/ (Maps 207, 268, 271, 273, 274 and 276b). /i/ and /iː/ are close front, /ʊ/ and /uː/ are close back, /e/ and /eː/ are close-mid front, /o/ and /oː/ are mid back, and /a/ and /aː/ are open central.

All these vowels have allophones depending on the phonetic environment, as is the case with pharyngealized allophones in proximity to pharyngealized consonants (e.g. /a/ changes to

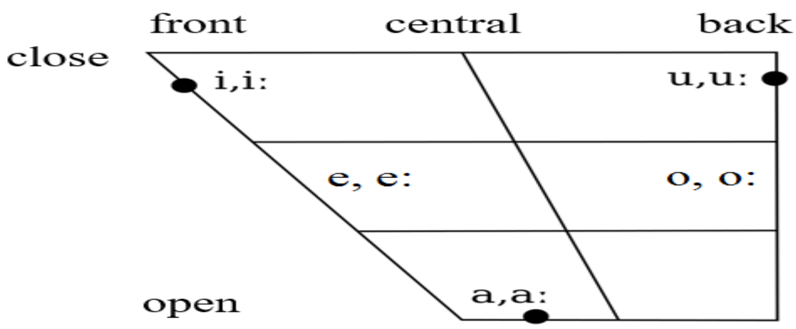


Figure 5.2: *Short and long vowels in EA varieties (collected from Woidich, 1996; Woidich, 2006a)*

[ɑ] as in [bas] '*enough*' versus [bɑsˤ] '*he looked*', and /aː/ to [ɑː] as in [daˈlaːl] '*flirtation'* versus [dˤɑˈlɑːl] '*going astray*'. In EA, the Fuṣḥā glides /aj/ and /aw/ have been unconditionally maintained in conservative dialects (mainly Bedouin) in some pockets in the northern isolated periphery of the Delta, the north and middle of Upper Egypt and the oases of the Western Desert (Wilmsen & Woidich, 2006; Behnstedt & Woidich, 1985, Maps 182 & 183). Nevertheless, [aj] and [aw] have monophthongized in the rest of the EA dialects to /eː/ and /oː/ (e.g. /bajt/ to [beːt] '*house*' and /nawm/ to /noːm/ '*sleep*') except in the following cases[28]:

1. if followed by /j/ or /w/ as in [ˈʕajjɪl] '*boy' and* [ˈħawwɪl] '*he transferred*';
2. if followed by a vowel as in [xaˈjaaba] '*dull-wittedness*' and [tˤɑˈwiːl] '*tall* masc. sing.*'*;
3. /aw/ is kept if it occurs in forms derived from roots with an initial *W* (Schmidt, 1974, pp. 99-100) as in:
   a. the passive participle of FORM I verbs (see a list of verb forms in EA in Appendix 6) as in [mawˈluːd] '*born'* derived from the root ***WLD*** '*to give birth'*;
   b. the 1st sing. (masc. and fem.) speaker of FORM I imperfect verbs as in [ˈʔɑwsˤɑl] '*I reach*' from the root ***WSˤL*** '*to reach*'; and
   c. comparative adjectival forms as in [ˈʔɑwdˤɑħ] '*clearer'* derived from the root

[28] Words with /aw/ followed by /l/ behave inconsistently: sometimes, /aw/ does not change, as in /ˈdawla/ '*state*' → [ˈdawla] and /ˈdʒwala/ '*tour'* → [ˈgawla] or [ˈdʒawla]; other times, /aw/ changes to /oː/, as in /ħawl/ '*year'* → [ħoːl] and /ˈlawla/ → [ˈloːla] '*but for'*.

WDˁH ‘*to be clear’*.

4. /aj/ is kept in active participle sing. fem. constructions derived from HOLLOW verbs such as /ˈnajma/ ‘*asleep*’, /ˈsajla/ ‘*liquid*’, /ˈdajxa/ ‘*dizzy*’, /ˈʕajza/ ‘*wanting*’ and /ˈfajta/ ‘*preceding*’.

/e/ and /o/ are the least common in EA. They are mid vowels that replace the long vowels /e:/ and /o:/ respectively before two consonants because of a morphological change, as is the case of suffixes in /be:t/ ‘*house’* + /na/ ‘*our’* → /ˈbetna/ ‘*our house’* and /no:m/ ‘*sleep’* + /na/ ‘*they’* → /no:mna/ > /ˈnomna/ ‘*our sleep’*. These processes refer to the respective change from the Fuşḩā glides /aj/ and /aw/ to long monophthongs /e:/ and /o:/ (except in the cases clarified above) and then to short mid vowels /e/ and /o/ before a consonant cluster.

Fuşḩā /aj/ → /e:/ → /e/ before a consonant cluster

Fuşḩā /aw/ → /o:/ → /o/ before a consonant cluster

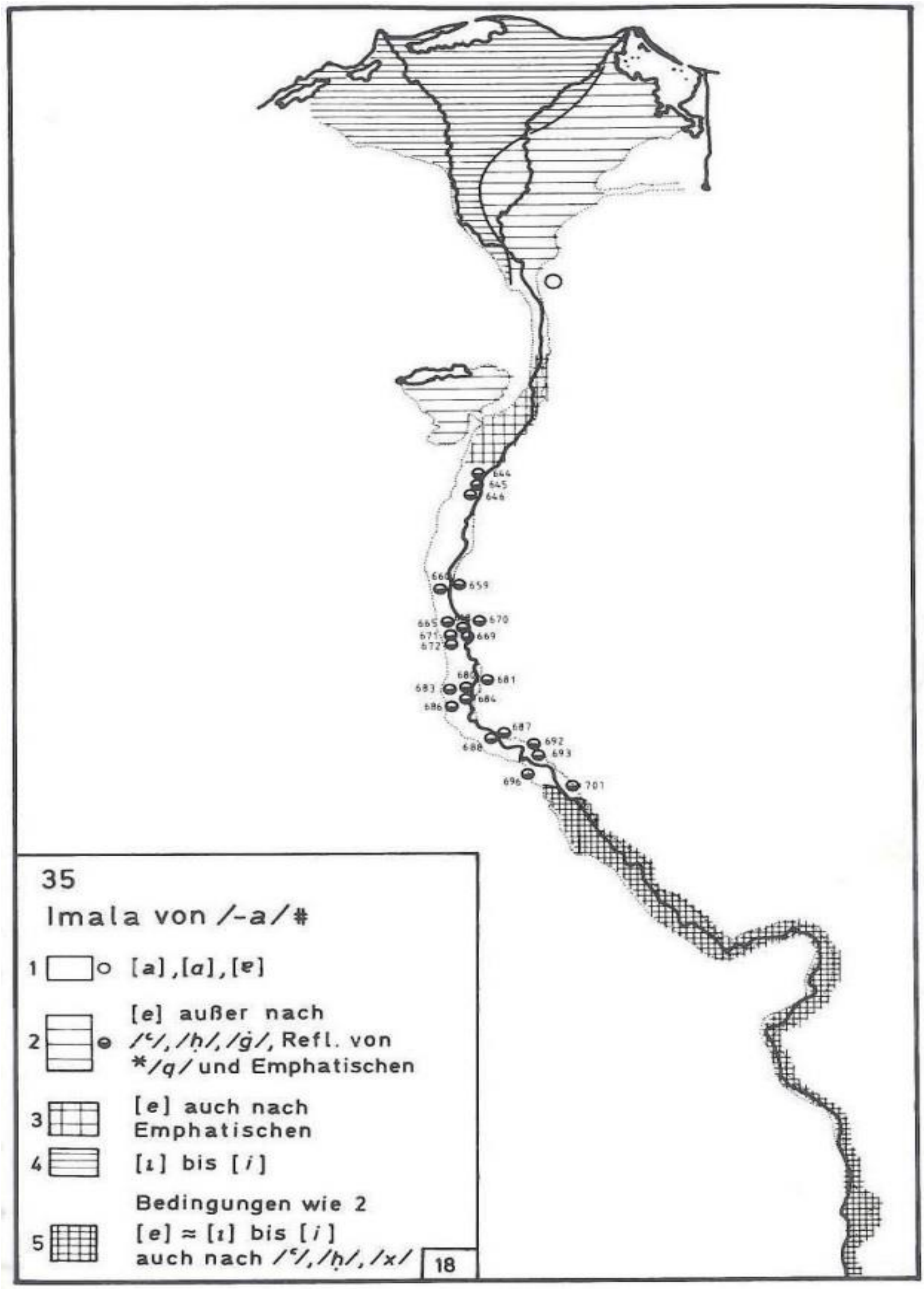
Other glides in EA varieties include:

Glides with /w/	**Examples ♦**	**Glides with /j/**	**Examples ♦**
/a:w/	/ˈħa:wɪl/ ‘*he tried’*	/a:j/	/ʃa:j/ ‘*tea’*
/ɪw/	/xɪˈlɪw/ ‘*emptiness’*	/ɪj/	/ˈmɪjja/ ‘*100’*
/i:w/	/ˈsi:wə/ ‘*Siwa’*	/ʊj/	/bʊˈju:t/ ‘*houses’*
/e:w/	/ħɪˈle:wə/ ‘*smart* masc. sing’	/u:j/	/ˈbu:ja/ ‘*paint’*
/ʊw/	/ˈhʊwwa/ ‘*he’*		

♦ These examples are used in most EA varieties, with slight vocalic differences from one variety to another, but the glides are almost always the same.

The aforementioned vocalic features, which are shared among most EA varieties, however, do not mask the many vocalic variations detailed in Behnstedt & Woidich (1985). One example of this variation is that in Map 35, which shows PAUSAL ‘IMĀLA of /a/ in final position, the five variants of which (as numbered on the map) are as follows:

1. [a] as in [ˈkalba] ‘*a female dog*’ and [ɑ] if preceded by an empathic, as in [ˈbatˤtˤɑ] ‘*a female duck*’;



Map 5.1: *ʿIMĀLA of /a/ in final position in Delta and the Nile Valley (Map 35 in Behnstedt & Woidich (1985))*

2. [e] as in [ˈkalbe], except after [ʕ], [ħ], [ɣ], a variant of (q) ([ʔ], [g], [x], etc.) and emphatics;
3. [e] in any context even after emphatics, as in [ˈkalbe] and [ˈbatˤtˤe];
4. [i] as in [ˈkalbi], except after [ʕ], [ħ], [ɣ], a variant of (q) ([ʔ], [g], [x], etc.) and emphatics; and
5. [i] in any context even after emphatics, as in [ˈkalbi] and [ˈbatˤtˤi].

A more detailed description of the variation in PAUSAL ʻIMĀLA is given in Maps 36, 37a and 37b (Behnstedt & Woidich, 1985).

5.2.2.1 Vowels in CA and MA: Similarities and differences

Both CA and MA have the same short and long vowels and glides as outlined above: /ɪ/, /e/, /a/, /o/, /ʊ/; /iː/, /eː/, /aː/, /oː/, /uː/; /ɪw/, /iːw/, /eːw/, /aw/, /aːw/, /ʊw/, /aj/ and /aːj/. In the two dialects, all vowels and glides have pharyngealized allophones in the vicinity of emphatics (Woidich, 2006a; Doss, 1981). But if the vowel inventories of both CA and MA are the same, the distribution of the vowels is different, and herein lie the vocalic differences between the two dialects. Before giving the vowel differences, we should make two clarifications:

1. MA as dealt with here is the sedentary variety used in Minya; Bedouin MA is not within the scope of the current study.
2. MA, as classified by Behnstedt & Woidich (1985), falls between two dialect isoglosses (see Map 1.5): NMA, north of Minya City, within Isogloss NME 2 and SMA, south of Minya City, within Isogloss SME. The two isoglosses do not always have the same vowel patterns; when different, the patterns of NMA almost always have the same CA vowel patterns. In the following section, the vocalic differences between CA and MA are classified into *categories* along with their phonological contexts and examples.

CATEGORY 1 applies if FORM I imperfect verbs starting with *wāw* are followed by [ʔ] or [g] corresponding to Fuṣḥā /q/ in their ASSIMILATED shape. Then, /w/ is replaced by [ʊ] in CA as in [ˈjʊʔaʕ] ‘*he falls*’ and by [ɪ] in NMA and SMA as in [ˈjigaʕ].

CATEGORY 2 applies to FORM II and FORM V perfect and imperfect verbs in their SOUND, DOUBLED and HOLLOW shapes. This category has three subcategories, as follows:

CATEGORY 2A. If no syllable has an emphatic or guttural sound,

- CA has the template [(ʔɪt)C_1**a**C_2C_2**ɪ**C_3][29] as in FORM II [ˈkallɪm][30] ‘*he spoke to someone*’ and [jɪˈkallɪm] ‘*he speaks to someone*’ and FORM V [ʔɪtˈkallɪm] ‘*he spoke*’ and [jɪtˈkallɪm] ‘*he speaks*’;
- NMA has the template [(ʔɪt)C_1**ɪ**C_2C_2**ɪ**C_3] as in FORM II [ˈkɪllɪm] and [jɪˈkɪllɪm] and FORM V [ʔɪtˈkɪllɪm] ‘*he spoke*’ and [jɪtˈkɪllɪm] ‘*he speaks*’; and
- SMA has the template [(ʔɪt)C_1**a**C_2C_2**a**C_3] as in FORM II [ˈkallam] and [jɪˈkallam] and FORM V [ʔɪtˈkallam] ‘*he spoke*’ and [jɪtˈkallam] ‘*he speaks*’.

CATEGORY 2B. If the 1st syllable has an emphatic or guttural sound,

- CA and NMA have the template [(ʔɪt)C_1**a**C_2C_2**ɪ**C_3] as in FORM II [ˈxallɪf] ‘*he begot*’ and [jɪˈxallɪf] ‘*he begets*’ and FORM V [ʔɪtˈxallɪf] ‘*he failed*’ and [jɪtˈxallɪf] ‘*he fails*’; and
- SMA has the template [(ʔɪt)C_1**a**C_2C_2**a**C_3] as in FORM II [ˈxallaf] and [jɪˈxallaf] and FORM V [ʔɪtˈxallaf] and [jɪtˈxallaf].

CATEGORY 2C. If the 2nd syllable has an emphatic or guttural sound,

- CA and NMA have the template [(ʔɪt)C_1**a**C_2C_2**a**C_3] as in FORM II [ˈwɑsˤsˤɑl] ‘*he gave a lift to someone*’ and [jɪˈwɑsˤsˤɑl] ‘*he gives a lift to someone*’ and FORM V [ʔɪtˈwɑsˤsˤɑl] ‘*it* (masc.) *got delivered’* and [jɪtˈwɑsˤsˤɑl] ‘*it* (masc.) *gets delivered*’; and
- SMA has the template [(ʔɪt)C_1**a**C_2C_2**a**C_3] with perfect verbs as in FORM II

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29 Without brackets, the FORM is II; and with them inserted, the FORM is V.
30 As usual in Arabic, the base perfect and imperfect form is the 3rd masc. sing. speaker.

['wɑsˤsˤɑl] and FORM V [ʔɪt'wɑsˤsˤɑl], and the template [(jɪt)C_1**a**C_2C_2**ɪ**C_3] with imperfect verbs as in FORM II [jɪ'wɑsˤsˤɪl] and FORM V [jɪt'wɑsˤsˤɪl]. Here, the perfect form is an exception, as it has the same CA and NMA form.

The same rules apply to derivatives that have the same template in addition to a prefix and/or suffix.

CATEGORY 3 applies to FORM III and FORM VI perfect and imperfect verbs in their SOUND and HOLLOW shapes. The CA and NMA template is [(ʔɪt)C_1**a:**C_2**ɪ**C_3][31] as in FORM III ['ħa:wɪl] '*he tried'* and [jɪ'ħa:wɪl] '*he tries'* and FORM VI [ʔɪt'ʕa:wɪn] '*he co-operated*' and [jɪt'ʕa:wɪn] '*he co-operates*', while the SMA template is [(ʔɪt)C_1**a:**C_2**a**C_3] as in FORM III ['ħa:wal] and [jɪ'ħa:wal] and FORM VI [ʔɪt'ʕa:wan] and [jɪt'ʕa:wan]. The same rules apply to derivatives that have the same template in addition to a prefix and/or suffix.

CATEGORY 4 applies to FORM VII imperfect verbs in their SOUND and DEFECTIVE shapes. The CA formula is [jɪt'C_1**ɪ**C_2**ɪ**C_3] or [jɪn'C_1**ɪ**C_2**ɪ**C_3] as in [jɪt'xɪbɪz] '*it is baked*' or [jɪn'hɪzɪm] '*he is overcome*', while the NMA and SMA template is [jɪt'C_1**a**C_2**a**C_3] or [jɪn'C_1**a**C_2**a**C_3], as in [jɪt'xabaz] or [jɪn'hazam]. The same rules apply to derivatives that have the same template in addition to a prefix and/or suffix.

CATEGORY 5 applies to FORM VIII imperfect verbs in their SOUND and DEFECTIVE shapes. The CA template is [jɪC_1't**ɪ**C_2**ɪ**C_3] as in [jɪm'tɪħɪn] '*he is examined*' while the NMA and SMA template is [jɪC_1't**a**C_2**a**C_3] as in [jɪm'taħan]. The same rules apply to derivatives that have the same template in addition to a prefix and/or suffix.

CATEGORY 6 applies to FORM X imperfect verbs in their SOUND, DOUBLED and DEFECTIVE shapes. It can also be subdivided into four subcategories:

CATEGORY 6A applies to the SOUND shape if C_1 ***is not*** an emphatic or guttural. In this case,

[31] Without brackets, the FORM is III; and with them inserted, the FORM is VI.

- The CA template is [jɪst**a**C_1C_2**ɪ**C_3] as in [jɪsˈtahbɪl] ‘*he treats someone as a fool*’;
- The NMA template is [jɪst**ɪ**C_1C_2**ɪ**C_3] as in [jɪsˈtɪhbɪl]; and
- The SMA template is [jɪst**a**C_1C_2**a**C_3] as in [jɪsˈtahbal].

CATEGORY 6B applies to the SOUND shape if C_1 ***is*** an emphatic or guttural. In this case,

- The CA and NMA template is [jɪst**a**C_1C_2**ɪ**C_3] as in [jɪsˈtaʕmɪl] ‘*he uses*’; and
- The SMA template is [jɪst**a**C_1C_2**a**C_3] as in [jɪsˈtaʕmal].

CATEGORY 6C applies to the DOUBLED shape. In this case,

- The CA and NMA template is [jɪst**a**C_1**ɪ**C_2C_2] as in [jɪstaˈʕɪdd] ‘*he gets ready*’; and
- The SMA template is [jɪst**a**C_1**a**C_2C_2] as in [jɪstaˈʕadd].

CATEGORY 6D applies to the HOLLOW shape. In this case,

- The CA and NMA template is [jɪst**a**C_1**i**:C_2] as in [jɪstaˈfiːd] ‘*he benefits*’; and
- The SMA template is [jɪst**a**C_1**a**:C_2] as in [jɪstaˈfaːd].

The same rules apply to derivatives that have the same template in addition to a prefix and/or suffix.

CATEGORY 7 applies to the 3rd sing. fem. suffix in perfect verbs. In the case of SOUND, DOUBLED and HOLLOW verbs, the CA and NMA form is [ɪt] as in [ˈʕamalɪt] ‘*she did*’, [ˈʕaddɪt] ‘*she counted*’ and [ˈkaːnɪt] ‘*she was*’, while the SMA form is /at/ as in [ˈʕamalat], [ˈʕaddat] and [ˈkaːnat]. In DEFECTIVE verbs ending in /a/ (e.g. /nawa/ ‘*to intend*’), however, the CA form is [ɪt] as in [ˈnawɪt] ‘*she intended*’ and the NMA and South form is [at], as in [ˈnawat].

5.2.2.2 Remarks on the vocalic differences in CA and MA

As detailed above and summed up in Table 5.1, the total categories and subcategories showing the vocalic differences between CA and MA are 28 in number. It is clear throughout that NMA is more similar to CA than it is to SMA; indeed, among the 28 categories, CA and NMA have the same vocalic patterns in 18 categories, NMA and SMA in 7 categories, and SMA and CA in 2 categories. The Fuṣḥā variants have been added to the table so that the whole picture is clear: SMA employs vocalic patterns identical or closely similar to those of Fuṣḥā (see the highlighted cells in Table 5.1) in 19 categories, NMA in 12 categories, and CA in 10 categories. Since it is well known that overt prestige is usually assigned to CA in Egypt, this is evidence that Fuṣḥā is not necessarily the variety that bears prestige, thereby proving Al-Wer's claim (2014) that Fuṣḥā is "irrelevant in the processes of variation and change in vernacular Arabic" (p. 403).

Observations representing all of the 28 categories mentioned above were found in the data in the current study, and the researcher faced a problem in coding them. The problem was that some speakers generally used a lot of CA consonantal variants (e.g. [ʔ] for (q)) and SMA vowels, which are the same as Fuṣḥā vowels. Use of the prestigious consonantal variants but the less prestigious (or even stigmatised) vocalic variants by the same speaker appeared non-uniform. For instance, Participant PMYV1-5 used the following sentence:

[ʔaʕˈtaqɪd law ʔɪl-mʊdarrɪˈsiːn **ʕallaˈmuːna** bɪ-tˤɑˈriː**g**ɑ sˤɑˈħiːħɑ ˈkʊnna ħɑˈsˤɑlnɑ ʕala tɑ**q**dˤɪˈrɑːtˤ ˈʔɑfdˤɑl tɪxalˈliːna ˈnʊ**q**bal fɪ-gamˈʕaːt ˈʔɑfdˤɑl] '*I think if teachers had taught us in a proper way, we would have got better grades that would have secured our admission to better universities.*' [32]

This participant is a young male who was born and brought up in the countryside, but moved to live in town when he started his Master's degree, and finally got a job and settled in town. His use of CA [ʔ] and [g], the respective variants of (q) and (dʒ), was very high, but his use of CA vowels was low. Although the participant was born and brought up in an NMA borough, most of the vocalic variants he used were SMA variants. This is due to the fact that he code-switched between CA, MA and Fuṣḥā. In the last example, he used the SMA verb variant [ʕallaˈmuːna] '*they taught us*' (CATEGORY 2B, FORM V, perfect) within a sentence that has

[32] The stress patterns used are completely CA. See Chapter 6 for more information.

***Table 5.1**: Vocalic differences between CA and MA*

<table>
<tr><th>Category</th><th>Verb Form</th><th>Tense</th><th>Gloss</th><th>Fuṣḥā[33]</th><th>CA</th><th>NMA</th><th>SMA</th><th>Shape</th><th>Condition</th></tr>
<tr><td>1</td><td>I</td><td>imperfect</td><td>he falls</td><td>[jaqɪfʊ]</td><td>[ˈjʊʔaf]</td><td colspan="2">[ˈjɪgaf]</td><td>ASSIMILATED</td><td>Starts with wāw and followed by [ʔ] or [g]</td></tr>
<tr><td rowspan="4">2A</td><td rowspan="2">II</td><td>perfect</td><td>he spoke to sbdy</td><td>[kallama]</td><td>[ˈkallɪm]</td><td>[ˈkɪllɪm]</td><td>[ˈkallam]</td><td rowspan="4">SOUND, DOUBLED & HOLLOW</td><td rowspan="4">No emphatic or guttural sound in any syllable</td></tr>
<tr><td>imperfect</td><td>he speaks to sbdy</td><td>[jʊkallɪmʊ]</td><td>[jɪˈkallɪm]</td><td>[jɪˈkɪllɪm]</td><td>[jɪˈkallam]</td></tr>
<tr><td rowspan="2">V</td><td>perfect</td><td>he spoke</td><td>[takallama]</td><td>[ʔɪtˈkallɪm]</td><td>[ʔɪtˈkɪllɪm]</td><td>[ʔɪtˈkallam]</td></tr>
<tr><td>imperfect</td><td>he speaks</td><td>[jatkallamʊ]</td><td>[jɪtˈkallɪm]</td><td>[jɪtˈkɪllɪm]</td><td>[jɪtˈkallam]</td></tr>
<tr><td rowspan="4">2B</td><td rowspan="2">II</td><td>perfect</td><td>he taught</td><td>[ʕallama]</td><td colspan="2">[ˈʕallɪm]</td><td>[ˈʕallam]</td><td rowspan="4">SOUND, DOUBLED & HOLLOW</td><td rowspan="4">An emphatic or guttural sound in the 1st syllable</td></tr>
<tr><td>imperfect</td><td>he teaches</td><td>[jʊallɪmʊ]</td><td colspan="2">[jɪˈʕallɪm]</td><td>[jɪˈʕallam]</td></tr>
<tr><td rowspan="2">V</td><td>perfect</td><td>he learnt</td><td>[taʕallama]</td><td colspan="2">[ʔɪtˈʕallɪm]</td><td>[ʔɪtˈʕallam]</td></tr>
<tr><td>imperfect</td><td>he learns</td><td>[jataʕallamʊ]</td><td colspan="2">[jɪtˈʕallɪm]</td><td>[jɪtˈʕallam]</td></tr>
<tr><td rowspan="4">2C</td><td rowspan="2">II</td><td>perfect</td><td>he gave a lift to sbdy</td><td>[wɑsˤsˤɑlɑ]</td><td colspan="3">[ˈwɑsˤsˤɑl]</td><td rowspan="4">SOUND, DOUBLED & HOLLOW</td><td rowspan="4">An emphatic or guttural sound in the 2nd syllable</td></tr>
<tr><td>imperfect</td><td>he gives a lift to sbdy</td><td>[jʊwɑsˤsˤɪlʊ]</td><td colspan="2">[jɪˈwɑsˤsˤɑl]</td><td>[jɪˈwɑsˤsˤɪl]</td></tr>
<tr><td rowspan="2">V</td><td>perfect</td><td>it (masc.) got delivered</td><td>[tawɑsˤsˤɑlɑ]</td><td colspan="3">[ʔɪtˈwɑsˤsˤɑl]</td></tr>
<tr><td>imperfect</td><td>it (masc.) gets delivered</td><td>[jatawɑsˤsˤɑlʊ]</td><td colspan="2">[jɪtˈwɑsˤsˤɑl]</td><td>[jɪtˈwɑsˤsˤɪl]</td></tr>
<tr><td rowspan="4">3</td><td rowspan="2">III</td><td>perfect</td><td>he tried</td><td>[ħaːwala]</td><td colspan="2">[ˈħaːwɪl]</td><td>[ˈħaːwal]</td><td rowspan="4">SOUND & HOLLOW</td><td rowspan="4"></td></tr>
<tr><td>imperfect</td><td>he tries</td><td>[jʊħaːwɪlʊ]</td><td colspan="2">[jɪˈħaːwɪl]</td><td>[jɪˈħaːwal]</td></tr>
<tr><td rowspan="2">VI</td><td>perfect</td><td>he co-operated</td><td>[taʕaːwana]</td><td colspan="2">[ʔɪtˈʕaːwɪn]</td><td>[ʔɪtˈʕaːwan]</td></tr>
<tr><td>imperfect</td><td>he co-operates</td><td>[jataʕaːwanʊ]</td><td colspan="2">[jɪtˈʕaːwɪn]</td><td>[jɪtˈʕaːwan]</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">VII</td><td rowspan="2">imperfect</td><td>it is baked</td><td>[jʊxbazʊ]</td><td>[jɪtˈxɪbɪz]</td><td colspan="2">[jɪtˈxabaz]</td><td rowspan="2">SOUND & DEFECTIVE</td><td rowspan="2"></td></tr>
<tr><td>he is overcome</td><td>[jʊhzam]</td><td>[jɪnˈhɪzɪm]</td><td colspan="2">[jɪnˈhazam]</td></tr>
<tr><td>5</td><td>VIII</td><td>imperfect</td><td>he is examined</td><td>[jʊmtaħanʊ]</td><td>[jɪmˈtɪħɪn]</td><td colspan="2">[jɪmˈtaħan]</td><td>SOUND & DEFECTIVE</td><td></td></tr>
<tr><td>6A</td><td rowspan="4">X</td><td rowspan="4">imperfect</td><td>he takes sthg easily</td><td>[jastashɪlʊ]</td><td>[jɪsˈtashɪl]</td><td>[jɪsˈtɪshɪl]</td><td>[jɪsˈtashal]</td><td>SOUND</td><td>C_1 is not an emphatic or guttural</td></tr>
<tr><td>6B</td><td>he uses</td><td>[jastaʕmɪlu]</td><td colspan="2">[jɪsˈtaʕmɪl]</td><td>[jɪsˈtaʕmal]</td><td>SOUND</td><td>C_1 is an emphatic or guttural</td></tr>
<tr><td>6C</td><td>he gets ready</td><td>[jastaʕɪddʊ]</td><td colspan="2">[jɪstaˈʕɪdd]</td><td>[jɪstaˈʕadd]</td><td>DOUBLED</td><td rowspan="2"></td></tr>
<tr><td>6D</td><td>he benefits</td><td>[jastafiːdʊ]</td><td colspan="2">[jɪstaˈfiːd]</td><td>[jɪstaˈfaːd]</td><td>HOLLOW</td></tr>
<tr><td rowspan="4">7</td><td rowspan="4"></td><td rowspan="4">perfect</td><td>she did</td><td>[ʕamɪlat]</td><td colspan="2">[ˈʕamalɪt]</td><td>[ˈʕamalat]</td><td>SOUND</td><td rowspan="3"></td></tr>
<tr><td>she counted</td><td>[ʕaddat]</td><td colspan="2">[ˈʕaddɪt]</td><td>[ˈʕaddat]</td><td>DOUBLED</td></tr>
<tr><td>she was</td><td>[kaːnat]</td><td colspan="2">[ˈkaːnɪt]</td><td>[ˈkaːnat]</td><td>HOLLOW</td></tr>
<tr><td>she intended</td><td>[nawat]</td><td>[ˈnawɪt]</td><td colspan="2">[ˈnawat]</td><td>DEFECTIVE</td><td>ending in /a/</td></tr>
</table>

33 In all Categories, in Fuṣḥā as well as CA and MA, verbs are conjugated in the 3rd masc. sing. speaker and the active voice. An exception is Category 7 where the 3rd fem. sing. speaker is used. All imperfect verbs are in the indicative mood (CA and MA imperfect verbs can be used with a prefix serving as an aspectual marker, progressive *bi-* and future *ha-* or *ḥa-*).

* The highlighted cells show the similarity between the dialect highlighted and Fuṣḥā.

many Fuṣḥā features, including:

- Using the variant [q] of (q) rather than a dialectal variant, i.e. [ʔ] or [g], in [tɑ**q**dˤɪˈɾɑːtˤ] '*grades*';
- Using the variant passive form [ˈnʊqbɑl] '*we are admitted*' instead of a dialectal variant, [nɪtˈʔ(g)ɪbɪl] or [nɪtˈʔ(g)abal];
- Borrowing some lexical items from Fuṣḥā rather than using frequent items in EA: [ʔaʕˈtɑqɪd] '*I think*' in preference to [ʔɑˈzˤʊnn] or [ˈʔana ˈʃaːjɪf] and [ħɑˈsˤɑlnɑ] '*we got*' rather than [ˈg(dʒ)ɪbna] or [ˈxadna].

Firstly, this shows that codeswitching between Fuṣḥā and a dialect occurs at the phonological, morphological and lexical levels simultaneously, and not just on one level. In particular, it shows that the use of vowels in [ʕallaˈmuːna] should not be counted as CA or MA. Any coding that does not take codeswitching (if any) between Fuṣḥā and dialect into account when counting vowels, is definitely erroneous. To avoid this mistake, the researcher disregarded all tokens including Fuṣḥā vocalic variants produced by the participant mentioned above and the other participants.

5.3 Vocalic Variation in Arabic

The best example of vocalic variation in Arabic comes from the differences between sedentary (rural and urban) and Bedouin dialects. Apart from the many consonantal differences (see Palva, 2006, p. 606 for a summary), there are a good number of vocalic differences, usually in the form of *vowel replacement*. An example from MA is the difference between sedentary and Bedouin MA in the conjugation of the verb **KATABA** '*to write*' in the perfect, as shown in Table 5.2. From the researcher's observations in MA, these vocalic Bedouin features represent Bedouins in Minya no less than the consonantal differences, especially in the countryside (for all differences between sedentary and Bedouin MA, see section 2.5.2).

Table 5.2*: Vocalic differences in the verb KATABA 'to write' conjugation in the perfect in sedentary and Bedouin MA*

Person		**Gender**	**Bedouin MA**	**Sedentary MA**	**Fuşḩā**	
1st	sing.	masc./fem.	[kɪˈt**a**bɪt]	[kɪˈt**ɪ**bt]	[katabtʊ]	كَتَبْتُ
	pl.	masc./fem.	[k**ɪ**ˈt**a**bna]	[k**a**ˈt**a**bna]	[katabna]	كَتَبْنَا
2nd*	sing.	masc.	[kɪˈt**a**bɪt]	[kɪˈt**ɪ**bt]	[katabta]	كَتَبْتَ
		fem.	[kɪˈt**a**bti]	[kɪˈt**ɪ**bti]	[katabti]	كَتَبْتِ
	pl.	masc.	[k**ɪ**ˈtabtʊ]	[k**a**ˈtabtʊ]	[katabtʊm]	كَتَبْتُمْ
		fem.	[k**ɪ**ˈtabt**an**]	[k**a**ˈtabt**ʊ**]	[katabtʊnna]	كَتَبْتُنَّ
3rd	sing.	masc.	[kɪˈt**a**bb]	[ˈkɪt**ɪ**b]	[kataba]	كَتَبَ
		fem.	[ʔɪkˈtib**a**t]	[ˈkɪtɪb**ɪ**t]	[katabat]	كَتَبَتْ
	pl.	masc.	[ʔɪkˈtib**aw**]	[ˈkɪtɪbʊ]	[katabuː]	كَتَبُوا
		fem.	[ʔɪkˈtib**an**]	[ˈkɪtɪbʊ]	[katabna]	كَتَبْنَ

*** There is no dual in MA.**

Similar vocalic differences between sedentary and Bedouin varieties also exist in other Arabic-speaking speech communities.

5.3.1 Studying vocalic variation in Arabic

Despite the numerous variations in vocalic phonemes and allophones in Arabic dialects, variationists have largely ignored them, sometimes clearly stating that there is no excuse for this wilful marginalisation (Jassem, 1987, pp. 70-71). Expounding the reasons for this neglect, Al-Wer claims that vocalic variation is sociolinguistically less significant than consonantal variation (2002b, p. 78) and that "there is a widespread impression that consonantal variation is sociolinguistically more salient … [and] certainly much easier to detect since it deals with discrete linguistic differences, whereas vocalic variations are gradient in nature" (2007, pp. 67-68). But this explanation conceals the fact that instrumental phonetics has greatly advanced, making the detection of the '*gradient'* vocalic variation easy as well.

But why is consonantal variation *more salient and easier to detect* than vocalic variation? This could be attributed to the fact that Arabic is a root-system language in which lexical meaning depends on the root, which is a semantic abstraction for the most part consisting of three radical consonants. Words are derived from the root via the "superimposition of templatic patterns" (Holes, 2004, p. 99), which is achieved by using prefixes and suffixes mainly composed of vowels. The root letters have to follow the same order to express a meaning and, if rearranged, give another meaning. For instance, the roots ***KTB, KBT*** and ***BKT*** are composed of the same three consonant phonemes: ***KTB*** generally relates to the meaning of *writing*, ***KBT*** to *restraint* and ***BKT*** to *scolding*. Words derived from the same root are related in form and meaning[34]. For example, all the following words in Fuşḩā and CA are derived from the root ***KTB***:

Fuşḩā	**CA**	**Translation**
[kataba]	[ˈkatab]	*he wrote*
[kaːtɪb]	[ˈkaːtɪb]	*writer*
[maktuːb]	[makˈtuːb]	*written*
[kaːtaba]	[ˈkaːtab]	*he corresponded with*
[mʊkaːtaba]	[mʊˈkatba]	*correspondence*
[ʔistaktaba]	[ʔisˈtaktab]	*he sought writing from someone*
[ʔɪstɪktaːb]	[ʔɪstɪkˈtaːb]	*seeking writing from someone*
[ʔɪktataba]	[ʔɪkˈtatab]	*he subscribed*
[ʔɪktɪtaːb]	[ʔɪktɪˈtaːb]	*subscription*
[maktab]	[ˈmaktab]	*office*
[maktaba]	[makˈtaba]	*library*
[kitaːb]	[kiˈtaːb]	*book*
[kʊtajjɪb]	[kʊˈtajjɪb]	*booklet*
[kitaːba]	[kiˈtaːba]	*writing*
[kʊttaːb]	[kʊtˈtaːb]	*Qur'an school*
[kʊtʊbɪjj]	[ˈkʊtʊbi]	*bookdealer*

Provided that the structure is understood by listeners, vowel differences, or more accurately *vowel replacing*, do not cause a difference in meaning in Arabic dialects, as is the case in other languages. For example, the CA-verb [ˈnɪzɪl] '*to go out'* or *'go downstairs'* in a sentence like

[hɪˈʃaːm ˈnɪzɪl mɪn ˈbeːtʊ mɪn ˈbadri] '*Hishaam went out from his house a long time ago*'

can be understood even if the vowels in the verb change partially or completely. The variants of the verb may include:

[nazal], [nazɪl], [nazul], [nɪzɪl], [nɪzal], [nɪzul], [nuzul], [nuzal] or [nuzɪl]

[34] This is the traditional approach, to which there are alternative approaches depending on words or stems. For more information, see Ratcliffe (2013, pp. 70-85).

There is no claim that all of these variants exist in spoken Arabic, though all are possible. Although the variant [ˈnuzul] can be used as a noun meaning '*guest house*' or '*hostel*', this is prohibited by the structure where [ˈnɪzɪl] is preceded by a noun acting as the subject; so, even [ˈnuzul] would be understood as a verb in the example outlined above. In all cases, the meaning is understood because it depends on the root ***NZL,*** which is the same in all the possible variants. Therefore, vowel differences are not sociolinguistically as salient as consonantal differences.

Another reason behind the difficulty of detecting vocalic variation in Arabic may be the diglossic switching between vowel patterns in Fuṣḥā and a dialect (for details and examples, see section 5.2.2.2 above).

5.4 Literature Review

As mentioned above, the literature on vocalic variation in Arabic is limited. Among the features that have been largely covered are 'IMĀLA (vowel raising) of the final-position sing. fem. gender marker (ah) and the glide variables (aj) and (aw). Although irrelevant to the variables focused upon in the present study, reporting the literature on these vocalic differences in Arabic dialects shows that vocalic differences in general are just as fruitful an area of research as consonantal differences.

5.4.1 'IMĀLA (vowel raising)

'IMĀLA (literally '*inclination*' or '*bending*'), which was first described by Sibawayh in his treatise *Al-Kitāb* (Al-Nassir, 1985, p. 160), is a vowel shift from an open vowel to a close one in a word, either medially, finally or both, unless the environment has a blocking segment (i.e. emphatics, pharyngeal or velarized sounds). At the time of Sibawayh, like today, there were many differences in adopting 'IMĀLA at individual and tribal levels, and he dealt with those differences from a variationist perspective (for details, see Owens, 2006, pp. 207-209). In modern spoken Arabic, 'IMĀLA, in phonetic terms, "corresponds to a raised and fronted realization of the open central vowel [a], which could be pronounced [æ] (raised low vowel), [ɛ] (lower mid vowel), [e] (higher mid vowel), or even [i] (high vowel)", with differences depending on speakers' dialectal background (Barkat, 2006, p. 678). Accordingly, medial 'IMĀLA may appear in [kɪˈtaːb] '*book*' which could be pronounced as [kɪˈtæːb], [kɪˈtɛːb], [kɪˈteːb] or [kɪˈtiːb], and final 'IMĀLA can be found in [ˈkɪlma] '*word*', which might be realised as [ˈkɪlmæ], [ˈkɪlmɛ], [ˈkɪlme] or [ˈkɪlmi]. Acoustically, 'IMĀLA corresponds to the lowering of F1 and raising of F2 (Barkat, 2006, p. 678).

'IMĀLA is stronger when it is final than when it occurs in the medial position. Final 'IMĀLA has been studied within sociolinguistics as the (ah) variable, a distinguishing feature of Levantine urban dialects, in which variants range from [a], [e], [ɛ] to even [i] in Lebanon and the North of Palestine (Al-Wer, 2007). The phonological conditions that allow or prohibit 'IMĀLA (henceforth, vowel raising) differ from one dialect to another.

5.4.1.1 Vowel raising in Irbid, Jordan

Al-Khatib (1988) explored the diglossic use of (ah) as used by 29 participants from Irbid, Jordan, in four styles: casual speech, formal speech, passage reading and word list. The variants of (ah) in Irbid include the Fuşḥā variant [a] and what Al-Khatib calls the 'colloquial variant', [e]. Participants came from two ethnicities: Horanis and Fallaḥīn. Horanis migrated to Irbid from the surrounding rural areas starting from the 1930s and Fallaḥīn migrated from the rural areas of the West Bank of Jordan (part of Palestine after 1988) following the two Arab-Israeli wars in 1948 and 1967. The default variant of (ah) in Palestine is (e) and the default variant in Jordan is [a] (Al-Wer, 2002b; 2007). This could be the reason why Al-Khatib found that in the speech of Jordanian Horanis the variant [e] is blocked by [w], [f], [b], [k] and [ɫ], but this does not obtain in that of Palestinian Fallaḥīn, though in the speech of both groups vowel raising is blocked by [sˤ], [dˤ], [tˤ], [ðˤ], [x], [ɣ], [ʕ], [ħ], [h], [q] and [ɾ].

Focusing on the use of the (ah) variants by style in environments allowing the use of [a] and [e], as in [kɪlma]/[kɪlme] '*word*', Al-Khatib found that the Fuşḥā variant [a] was frequently used in the two reading styles, passage reading (95%) and word list (93%), but was minimally used in the two speaking styles, conversational (2%) and formal (10%). By contrast, [e] was highly used in the speaking styles and minimally used in the reading styles. This does not show anything surprising: any native speaker of Arabic with a minimal level of education will tend to use the Fuṣḥā variant [a] (High Form) in reading aloud a passage or a word list, and the colloquial (Low Form) variant, whatever it is, will be adopted by all speakers when speaking. What is really surprising in Al-Khatib (1988) is that he did not discuss the role of participants' dialectal background in adopting [e] in the two speaking styles, as if [e] was the default Horani/Jordanian variant, which is not true.

5.4.1.2 Vowel raising in Korba, Tunisia

Walters (1991) explored the use of (ah) among a sample of 23 participants stratified according to sex, education and age, in the small Tunisian town of Korba, about 78 km south-east of the capital Tunis. The sex of participants was fairly equally stratified: 12 females and 11 males. Their ages ranged between 17 and 100, and they were coded as young females (7 participants between 17 and 25), young males (6 participants between 26 and 32), old females (5 participants between 45 and 100) and old males (5 participants between 37 and 63). In Korba, the (ah) variable has three variants: [ɛː] (the standard variant used by the educated and wealthy), [iː] and [ɨː]. The latter two variants are the non-prestigious variants recognised as a feature of the dialect of Korba, “a feature that is often the subject of derision when used outside Korba or with Tunisians from other areas” (p. 209).

Walters found that the standard variant [ɛː] was used most by young males, followed by young females, then old males, and lastly old females. These results show sex- and age-correlated differences. In terms of sex, young males used the standard variant more than young females, which is explained by young males' extensive contact with people from outside Korba and young females' limited contact with them. Though both young males and females were educated in schools or universities outside Korba and commuted to other Tunisian cities, still "males in general, were more likely to have been educated and more highly educated than females of their age cohort" (p. 211). Young males also had experience in military service and travel. As for age, the results show that the younger the speaker, the more [ɛː] was used because, according to Walters, young males and females were educated and more mobile than the old, especially old females. Added to this, some old participants lived on farms outside the town and did not mix with many other people. It can be concluded, then, that the age of Walter's participants predicted education and social network: the young participants were more educated and, therefore, had a loose social network because their education was undertaken outside Korba and involved contact with Tunisians from different backgrounds. In contrast, the old did not have high levels of education and were less mobile; thus, they kept the traditional Korba variants [iː] and [ɨː] more than did the young.

5.4.1.3 Vowel raising in Amman, Jordan

Al-Wer (2002b) investigated the outcomes of contact between Jordanian and Palestinian dialects and the role of this contact in the emergence of a new dialect in Amman. Among many variables, (ah) was investigated through the analysis of interviews recorded with 36 participants between the ages of 12 and 70 representing three generations: grandparents (8), parents (8) and their children (20). Because of the absence of real-time data that served as the input to the dialect spoken in Amman, the participants were selected from families that originally descended from Salt in Jordan and Nablus in Palestine because a substantial number of the early immigrants to Amman came from these two cities. Indeed, 10 participants from Salt and 4 from Nablus were recorded in their respective cities, where they were still resident. The rest were resident in West Amman.

By analysing the data from Salt and Nablus, Al-Wer reached the following conclusions:

a) All old/first generation and middle-aged/second generation speakers in Salt used the variant [a] in all environments except after *plain* coronal sounds[35] (see examples in Table 5.3), where they used [ɛ]. [a] changes to [ɑ] when directly preceded by, or in the vicinity of, a velarized or emphatic sound. Only young speakers used [a]/[ɑ] and [ɛ] variably after plain coronal sounds.

b) With no exceptions, all age groups in Nablus used [e], except after velarized, emphatic and pharyngeal sounds, where they used [a].

The data from Amman also led to the following conclusions:

c) Jordanian grandparents/first generation adopted the traditional Salt pattern consistently;

d) Jordanian parents/second generation used [ɛ], with the mothers leading the change from [a] to [ɛ]; and

e) The young/third generation 'Ammanis', all born in Amman to Jordanian and Palestinian parents, mostly used a fudged raised form, a mixture of Palestinian phonology (i.e. raising in all environments except after velarized, pharyngeal and emphatic sounds) and Jordanian phonetics (i.e. [ɛ]). The Palestinian variant [e] was still used by some Ammanis of Palestinian parents, especially by those aged 12 and 13, which suggests, as explained by Al-Wer (2002b, p. 72), that they were still affected by their parents at home. Palestinian females between 16 and 20 were also found to diverge from [e] on [ɛ] more than males.

Al-Wer (2002b, p. 77) notices that the development in the speech of Ammanis could be reversed; that is, Ammanis could adopt Jordanian phonology (i.e. raising the variant of (ah) only after coronal sounds) and Palestinian phonetics (i.e. using the variant [e]). But what happened, Al-Wer maintains, is evidence that regional koinéization is operative in the

[35] Herin (2013, p 106) makes it clear that raising in Salt occurs categorically following coronal sounds except /l/ and /ɾ/, which behave differently as far as velarisation is concerned. While a back vowel in the vicinity of /ɾ/ is enough to initiate velarisation and, thus, block raising, as in [maʃˈhuːɾˤɑ] '*known*', a back vowel normally does not block raising except when occurring in the vicinity of an emphatic. Therefore, raising occurs in [ˈtˤufuːle] '*childhood*' but not in [ˈbɑsˤɑlˤɑ] '*an onion*'.

formation of the dialect of Amman, since all major urban Levantine dialects have the same Palestinian phonology.

***Table 5.3**: The variants of (ah) in Nablus, Salt and Amman by generation and linguistic condition (adapted from Al-Wer, 2002b)*

Generation	**City**	**Condition**				
		Default	**plain coronal**	**velarized**	**emphatic**	**pharyngeal**
1st Generation	Nablus	[ˈħɪlw**e**]	[ˈsan**e**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
	Salt	[ˈħɪlw**a**]	[ˈsan**ɛ**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
	Amman	[ˈħɪlw**a**]	[ˈsan**ɛ**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
2nd Generation	Nablus	[ˈħɪlw**e**]	[ˈsan**e**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
	Salt	[ˈħɪlw**a**]	[ˈsan**ɛ**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
	Amman	[ˈħɪlw**ɛ**]	[ˈsan**ɛ**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
3rd Generation	Nablus	[ˈħɪlw**e**]	[ˈsan**e**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
	Salt	[ˈħɪlwa]	[ˈsan**a**] or [ˈsan**ɛ**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]
	Amman	[ˈħɪlw**ɛ**]	[ˈsan**ɛ**] or [ˈsan**e**]	[ˈfɑtˤɾˤ**ɑ**]	[ˈɾʊxsˤ**ɑ**]	[ˈdʒaːmʕ**a**]

5.4.1.4 Vowel raising in Gaza, Palestine

Cotter (2016) examined the use of (ah) in Gaza City. The traditional Gazan variant is [a], as reported in Bergsträßer (1915) and Salonen (1979 and 1980) (as cited in Cotter, 2016), thus making Gaza Arabic unique within the raising urban Palestinian dialects, in which the default variant is [e] except following velarized, emphatic and pharyngeal sounds (Al-Wer, 2002b and 2007). Thus, these contrasts exist between Gaza Arabic and the other Palestinian Urban dialects:

Gaza	**Other Palestinian dialects**	**Gloss**	
[ˈnadwa]	[ˈnadw**e**]	*seminar*	Default
[ˈxɑtˤɾˤɑ]	[ˈxɑtˤɾˤ**ɑ**]	*at one time*	Preceded by a velarized sound
[ˈsˤulˠtˤɑ]	[ˈsˤulˠtˤ**ɑ**]	*authority*	Preceded by an emphatic sound
[ˈdʒaːmʕa]	[ˈdʒaːmʕ**a**]	*university*	Preceded by a pharyngeal sound

Cotter focused on the effect of age on the use of (ah) variable among 15 indigenous Gazan speakers sampled across three age groups. The elderly group included speakers over 65 who were born before the 1948 War that led to the establishment of Israel and massive refugee migration to the Gaza Strip from other areas in historic Palestine; the middle-aged group included 40-64-year-olds born after the 1948 War and between the 1967 and 1973 Wars, which brought in more refugees to the Gaza Strip; and the young group included 17-39-year-olds born after the 1973 War.

Applying an acoustic analysis of vowel duration, Cotter found that both young and middle-aged speakers used lower and backer variants of (ah) compared to the elderly, significantly in the case of the young but non-significantly in the case of the middle-aged. Based on these results, Cotter concluded that this change in Gaza Arabic, from a non-raising dialect to a raising one especially (as used by elderly speakers), is a result of dialect contact in Gaza.

What is interesting in Cotter's results is that the linguistic change towards vowel raising is led by the elderly, not the young. This can be interpreted in the light of the political situation in Gaza. Compared to the middle-aged and young indigenous Gazans, the elderly had a better opportunity to travel from one area to another in Palestine and must have had greater contact with refugees from historic Palestine to Gaza following the 1948 and 1967 Wars. Later, Gaza was occupied by Israeli forces and nearly completely separated from the rest of Palestine. In spite of the Israeli disengagement from the Gaza Strip in 2005, Israel still maintains a blockade of the strip and has control over it, internally and externally, and this has definitely stopped contact between young men in Gaza and other Palestinian cities.

5.4.2 (aj) and (aw)

The Fuṣḥā variants of (aj) and (aw) are [aj] and [aw], and they have monophthongized in most sedentary Arabic dialects. Only conservative dialects or dialect pockets (e.g. Aqrah and Sandor Jewish dialects, in the North of Iraq (Jastrow, 2006)) still keep the [aj] and [aw] unconditionally. Some sedentary dialects, as in EA sedentary varieties, keep [aj] and [aw] only in specific phonological and/or morphological conditions (see section 5.2.2). The shift from [aj] and [aw] to monophthongs is believed to have started in early mediaeval times (Blau, 1966) though this belief is not supported by evidence (Diem, 1985, as cited in Iványi, 2006). Though [eː] and [oː] are the most widely used monophthong variants, there are other numerous variants across Mashriqi and Maghrebi Arabic dialects (see details in Iványi, 2006).

5.4.2.1 (aj) and (aw) in CA

As mentioned in 4.4.2, Schmidt (1974) investigated diglossia in CA in the speech of 28 participants, 16 of whom were students (8 males and 8 females) at the American University in Cairo (AUC) and the other 12 working-class males from As-Sayyida Zaynab (SZ), a working-class quarter in Cairo. Schmidt designed four styles: A (spontaneous), B (careful), C (passage reading) and D (word list) and studied the variation among the participants in their use of the (aj) and (aw) variables, focusing on sex and education. As detailed above (see details and exceptions in section 5.2.2), in CA and the majority of EA varieties, the Fuṣḩā variants [aj] and [aw] have monophthongized into [eː] and [oː] respectively. For instance, the Fuṣḩā [ʕayn] '*eye'* and [mawt] '*death'* are [ʕeːn] and [moːt] in CA respectively.

Schmidt found no difference among his participants in their use of the CA variants [eː] and [oː] in Styles A and B. The differences, however, were found in the more formal Styles C and D, in which the AUC participants, both males and females, used the Fuṣḩā variants [aj] and [aw] significantly more than the SZ males. This also entails that the SZ males used the CA variants [eː] and [oː] significantly more than the AUC participants in Styles C and D. Based on these results, Schmidt concluded that the variation in (aj) and (aw) showed that education is more significant than sex in explaining the differences in usage among his participants. The AUC participants definitely had a higher level of education than did the SZ participants and, therefore, used the Fuṣḩā variants [aj] and [aw] in passage reading (Style C) and reading minimal pairs (Style D). These results contradict the results of the variation in (q) in the same study (Schmidt, 1974), in which both AUC and SZ males used the Fuṣḩā variant [q] in Styles C and D more than did the AUC females (see details in 4.4.2), which shows that consonantal variation, as in (q), is more salient than vocalic variation, as in (aj) and (aw).

5.4.2.2 (aj) and (aw) in Rades, Tunisia

Jabeur (1987) studied linguistic variation in Rades, located 9 km south-east of the capital Tunis, by focusing on 12 variables so as to explore the effect of dialect contact between the city dwellers and rural migrants on the latter group's patterns of speech variation. At the time the study was conducted, Rades was in "on-going transition from a 'traditional' rural society to an increasingly 'modern' urban one" (p. 1). Another aim of the study was to investigate linguistic variation in the speech of urban women in Rades, which was carried out by studying variation in the (aj) and (aw) variables as used by 12 females: 4 non-educated housewives aged between 53 and 80 and 8 working women aged between 17 and 29. The 8 working women had different educational levels: 4 university graduates, 3 secondary school graduates, and 1 with a primary-education level.

In the urban/prestigious dialect of Tunis, (aj) and (aw) respectively monophthongized as [iː] and [uː], but old females in Rades still maintained the rural variants [aj] and [aw]. Contrasts between the urban/prestigious and rural/non-prestigious variants (Jabeur, 1987, p. 110 and p. 112) include:

Variable	**Urban/prestigious**	**Rural/non-prestigious**	**Gloss**
(aj)	[siːf]	[sajf]	*sword*
(aw)	[luːz]	[lawz]	*almonds*

Jabeur noticed that the variants [iː] and [uː] contrast with [aj] and [aw] respectively only in the case of triliteral HOLLOW verbs in the imperative mood. For instance, [biːʕ] is used as the prestigious variant to mean '*selling'* and '*sell*, imperative', and [bajʕ] is used as the non-prestigious variant to mean the same. To avoid this confusion, Jabeur did not count any observations of this kind.

Statistical analysis by Jabeur (1987, pp-187-192) testing the influence of age, education, employment and job type of the participants on the distribution of the variants of (aj) and (aw) showed that young females with higher educational levels used the prestigious variants [iː] and [uː] significantly more than did old housewives with primary or no education. The analysis also showed that age is the most significant factor (significance threshold = 0.1%) followed by education, while employment and job type were not found to be significant.

Jabeur's results show that age and education are multicollinear (p. 190). This refers to a combination of both factors leading young, educated females living in Rades to converge on the prestigious variants [iː] and [uː]. Taking into account the fact that Rades is just 9 km south-east of Tunis and that, at the time of data collection in 1986, Rades was not fully urbanised, the young, educated female participants must have studied in urban Tunis. To do so, they must have commuted to urban Tunis on a regular basis and had face-to-face contact with Tunisis. This frequent contact led to a widening of these females' social networks. Thus, education was a "proxy" factor (Al-Wer, 2002a, p. 42) acting on behalf of social network: the educated participants had loose social networks that made them aware of the prestige of the Tunis dialect, while the non-educated old housewives were non-mobile with dense social networks that led them to maintain the non-prestigious variants [aj] and [aw] variants of Rades. This is quite similar to the results found by Walters (1991) in Korba regarding the (ah) variable (see section 5.4.1.2 above).

5.5 Vocalic Convergence from MA on CA

As detailed above (see section 5.2.2.1), there are many vocalic differences between CA and MA, as summed up in Table 5.1. All of these differences have been observed in the dataset gathered for the present study, but some of them have too few observations (e.g. 20 observations) to allow for statistical analysis. Therefore, focus has been placed on the most frequent vocalic differences, i.e. those with the largest number of observations, which are all CATEGORY 2 (A, B and C). These differences apply to FORM II and FORM V perfect and imperfect verbs in their SOUND, DOUBLED and HOLLOW shapes. The differences between the subcategories A, B and C arise because of the existence or absence of an emphatic or guttural sound in the first or second syllable. In Fuşḥā, FORM II has the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{a}C_3a$ in the perfect and $yuC_1\boldsymbol{a}C_2C_2\boldsymbol{i}C_3u$ in the imperfect. FORM V has the template $taC_1\boldsymbol{a}C_2C_2\boldsymbol{a}Ca$ in the perfect and $yataC_1\boldsymbol{a}C_2C_2\boldsymbol{a}C_3u$ in the imperfect. FORM II expresses the meaning of causing something to someone or something, while FORM V is reflexive (i.e. the subject brings about the effect on him-/herself) (Holes, 2004, p. 101 & 103). For instance, the transitive FORM II [ʕallama] means '*to teach*'; and the intransitive FORM V [taʕallama] means '*to learn*'. In CA and MA, the meanings of the verb FORMS II and V are the same, but the templates change, as in Table 5.4.

Table 5.4: *The vocalic variables investigated*

Variable	Condition	Form	Tense	CA	NMA	SMA
2A	Neither of the two syllables composing the form has an emphatic or guttural sound.	II	perf.	[ˈkallɪm]	[ˈkɪllɪm]	[ˈkallam]
			imperf.	[jɪˈkallɪm]	[jɪˈkɪllɪm]	[jɪˈkallam]
		V	perf.	[ʔɪtˈkallɪm]	[ʔɪtˈkɪllɪm]	[ʔɪtˈkallam]
			imperf.	[jɪtˈkallɪm]	[jɪtˈkɪllɪm]	[jɪtˈkallam]
2B	There is an emphatic or guttural sound in the 1st syllable.	II	perf.	[ˈxallɪf]	[ˈxallɪf]	[ˈxallaf]
			imperf.	[jɪˈxallɪf]	[jɪˈxallɪf]	[jɪˈxallaf]
		V	perf.	[ʔɪtˈxallɪf]	[ʔɪtˈxallɪf]	[ʔɪtˈxallaf]
			imperf.	[jɪtˈxallɪf]	[jɪtˈxallɪf]	[jɪtˈxallaf]
2C	There is an emphatic or guttural sound in the 2nd syllable or two emphatics, or gutturals, one in each syllable.	II	perf.	[ˈwazzaʕ] [ˈwɑsˤsˤɑl]	[ˈwazzaʕ] [ˈwɑsˤsˤɑl]	[ˈwazzaʕ] [ˈwɑsˤsˤɑl]
			imperf.	[jɪˈwazzaʕ] [jɪˈwɑsˤsˤɑl]	[jɪˈwazzaʕ] [jɪˈwɑsˤsˤɑl]	[jɪˈwazzɪʕ] [jɪˈwɑsˤsˤɪl]
		V	perf.	[ʔɪtˈwazzaʕ] [ʔɪtˈwɑsˤsˤɑl]	[ʔɪtˈwazzaʕ] [ʔɪtˈwɑsˤsˤɑl]	[ʔɪtˈwazzaʕ] [ʔɪtˈwɑsˤsˤɑl]
			imperf.	[jɪtˈwazzaʕ] [jɪtˈwɑsˤsˤɑl]	[jɪtˈwazzaʕ] [jɪtˈwɑsˤsˤɑl]	[jɪtˈwazzɪʕ] [jɪtˈwɑsˤsˤɪl]

To sum up, CA has the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{i}C_3$ in Subcategories 2A and 2B and the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{a}C_3$ in Subcategory 2C; NMA has the template $C_1\boldsymbol{i}C_2C_2\boldsymbol{i}C_3$ in Subcategory 2A, the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{i}C_3$ in Subcategory 2B and the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{a}C_3$ in Subcategory 2C; and SMA has the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{a}C_3$ in Subcategories 2A, 2B and 2C (only in the perfect; see the highlighted cells in Table 5.4) and the template $C_1\boldsymbol{a}C_2C_2\boldsymbol{i}C_3$ in Subcategory 2C in the imperfect. All these templates can have a prefix or suffix for the purpose of derivation and/or conjugation; therefore, these templates can be used with any part of speech. From now on, these subcategories will be called variables and will be statistically analysed separately. Subcategory 2A will be called (KaLLiM), Subcategory 2B will be called (XaLLiF) and Subcategory 2C will be called (WaSSaL).

5.6 Research Questions and Hypotheses

The research questions regarding the (KaLLim), (XaLLiF) and (WaSSaL) variables are:

RQ1: Are MA speakers abandoning the MA variants of the (KaLLim), (XaLLiF) and (WaSSaL) variables and converging on the CA variants?

RQ2: If so,

a. Is this happening in the same way with the three variables?
b. Who is converging on the CA variants in terms of gender, age, education and place of residence?
c. Why are they converging on the CA variants?

It is hypothesised that the CA variants of the three variables have diffused to Minya and are mainly converged on by young, highly-educated females living in town (either born in town or rural migrants to any urban centre in Minya).

5.7 Results

5.7.1 CA and MA variants of (KaLLiM), (XaLLiF) and (WaSSaL)

Table 5.5 shows the distribution of the CA and MA variants of (KaLLiM), (XaLLiF) and (WaSSaL). As is clear from the table and Figure 5.3, convergence on CA is the highest in the (KaLLiM) variable (69.42%), followed by the (WaSSaL) variable (62.02%) and the least in the (XaLLiF) variable (49.65%).

Table 5.5: *Distribution of the variants of (KaLLiM), (XaLLiF) and (WaSSaL)*

Variable	Frequency			%	
	CA	MA	Total	CA	MA
(KaLLim)	277	122	399	69.42	30.58
(XaLLiF)	71	72	143	49.65	50.35
(WaSSaL)	80	49	129	62.02	37.98

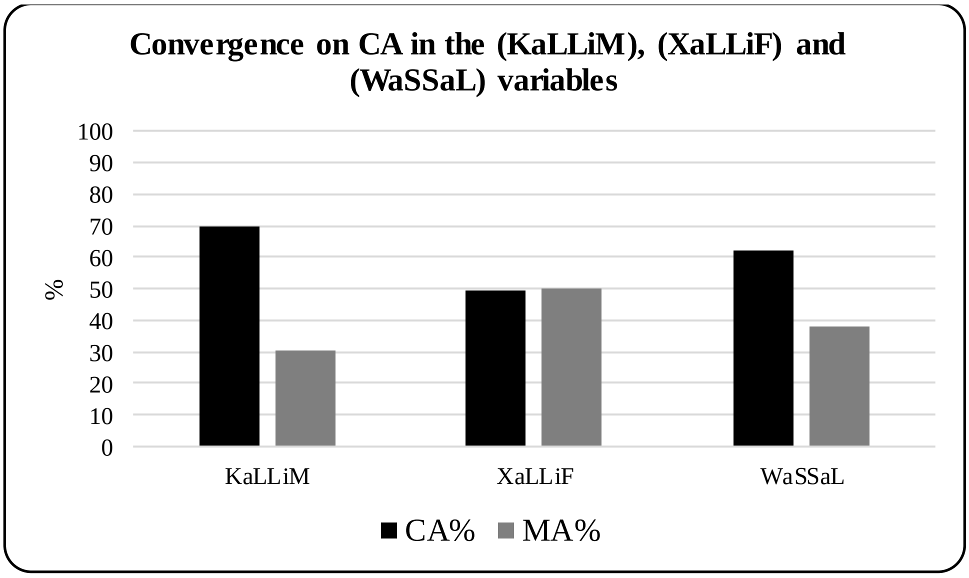


Figure 5.3: *Convergence on CA in the (KaLLiM), (XaLLiF) and (WaSSaL) variables*

5.7.2 Variation in (KaLLiM), (XaLLiF) and (WaSSaL) by social and linguistic factors

The frequency of the (KaLLiM), (XaLLiF) and (WaSSaL) variables is given in Table 5.6, which shows that the CA variants were used by

- females more than males in the three variables;
- the young more than the middle-aged and by the latter more than the old in the (KaLLiM) and (XaLLiF) variables, and by the old followed by the young and then the middle aged in the (WaSSaL) variable.
- postgraduates more than university students/graduates and by the latter more than those who have a secondary-education level or below, including the non-educated in the three variables; and

Table 5.6: *CA and MA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variable by social and linguistic factors*

Social Factors			Frequency			%	
			CA	MA	Total	CA	MA
(KaLLiM)	Gender	female	140	47	187	74.87	25.13
		male	137	75	212	64.62	35.38
	Age	young	165	38	203	81.28	18.72
		middle-aged	84	53	137	61.31	38.69
		old	28	31	59	47.46	52.54
	Education	secondary or below	35	63	98	35.71	64.29
		university	151	44	195	77.44	22.56
		postgraduate	91	15	106	85.85	14.15
	Place of residence	villager	76	67	143	53.15	46.85
		migrant	25	14	39	64.1	35.9
		urbanite	176	41	217	81.11	18.89
	Style	careful	42	15	57	73.68	26.32
		casual	235	107	342	68.71	31.29
	Preceding_sound	coronal	91	59	150	60.67	39.33
		dorsal	151	43	194	77.84	22.16
		labial	35	20	55	63.64	36.36
	Following_sound	coronal	135	62	197	68.53	31.47
		dorsal	42	11	53	79.25	20.75
		labial	100	49	149	67.11	32.89
(XaLLiF)	Gender	female	33	30	63	52.38	47.62
		male	38	42	80	47.5	52.5
	Age	young	42	21	63	66.67	33.33
		middle-aged	27	15	42	64.29	35.71
		old	2	36	38	5.26	94.74
	Education	secondary or below	3	44	47	6.38	93.62
		university	50	24	74	67.57	32.43
		postgraduate	18	4	22	81.82	18.18
	Place of residence	villager	28	38	66	42.42	57.58
		migrant	17	9	26	65.38	34.62
		urbanite	26	25	51	50.98	49.02
	Preceding_sound	coronal	48	50	98	48.98	51.02
		dorsal	9	6	15	60	40
		labial	14	16	30	46.67	53.33
	Following_sound	coronal	38	22	60	63.33	36.67
		dorsal	5	2	7	71.43	28.57
		labial	28	48	76	36.84	63.16
(WaSSaL)	Gender	female	52	22	74	70.27	29.73
		male	28	27	55	50.91	49.09
	Age	young	65	26	91	71.43	28.57
		middle-aged	13	23	36	36.11	63.89
		old	2	0	2	100	0
	Education	secondary or below	0	12	12	0	100
		university	68	36	104	65.38	34.62
		postgraduate	12	1	13	92.31	7.69
	Place of residence	villager	46	28	74	62.16	37.84
		migrant	6	1	7	85.71	14.29
		urbanite	28	20	48	58.33	41.67
	Style	careful	27	6	33	81.82	18.18
		casual	53	43	96	55.21	44.79
	Preceding_sound	coronal	23	32	55	41.82	58.18
		dorsal	45	16	61	73.77	26.23
		labial	12	1	13	92.31	7.69
	Following_sound	coronal	74	34	108	68.52	31.48
		dorsal	4	5	9	44.44	55.56
		labial	2	10	12	16.67	83.33

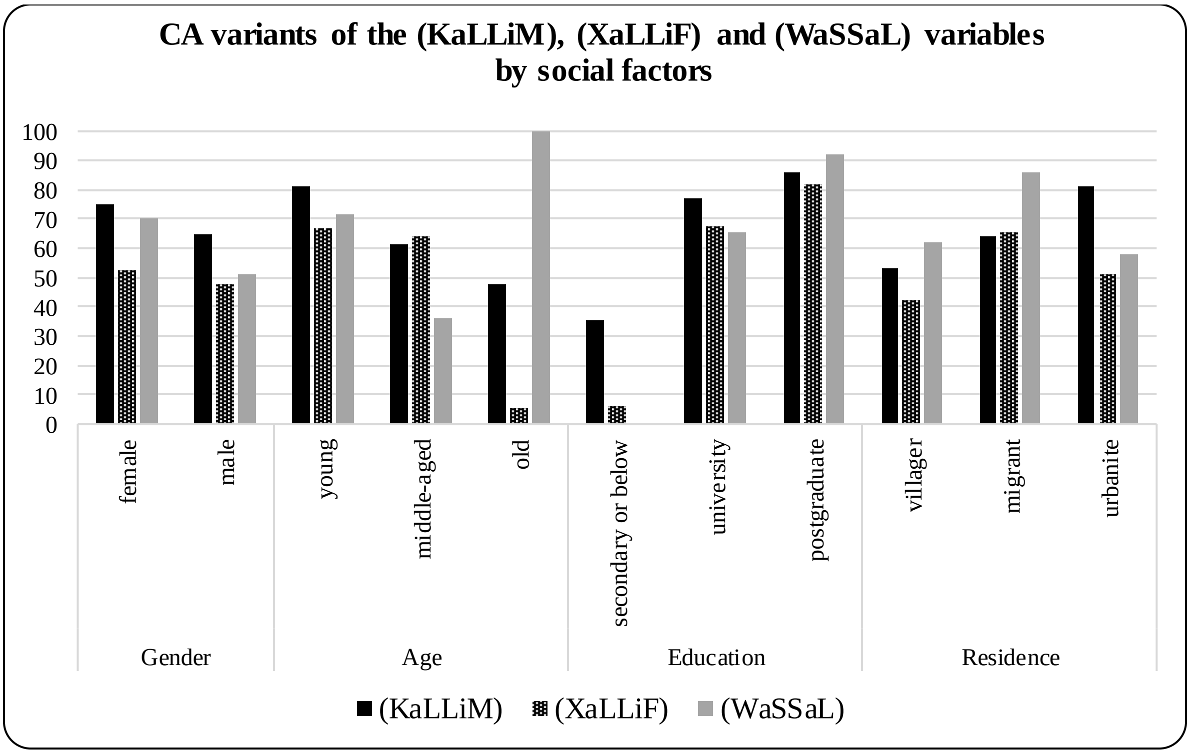


Figure 5.4: *CA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variables by social factors*

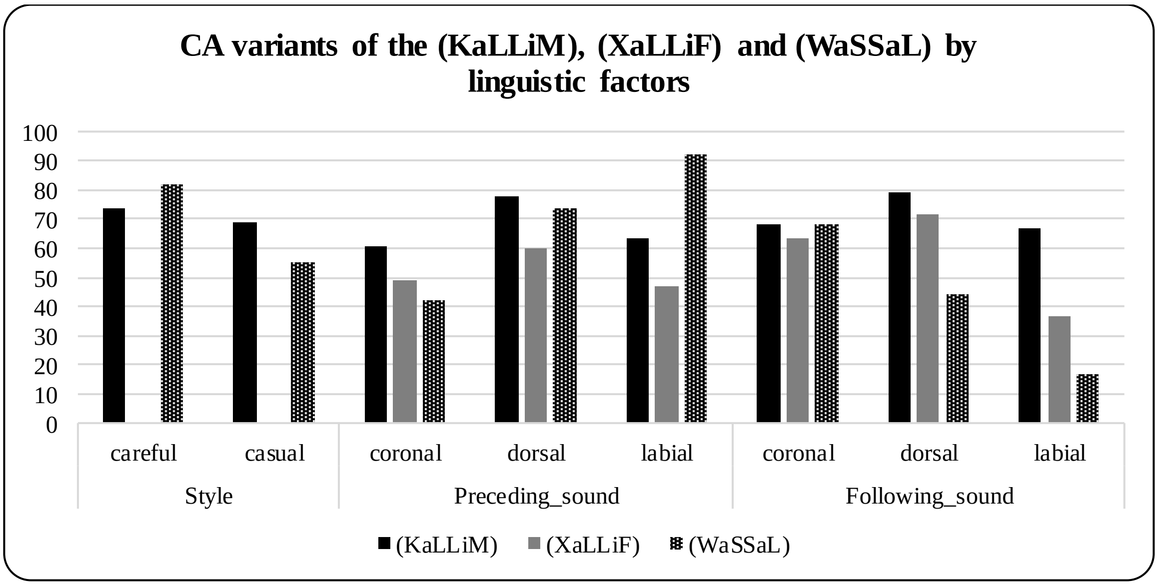


Figure 5.5: *CA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variables by linguistic factors*

- urbanites more than rural migrants and then villagers in the (KaLLiM) variable, rural migrants more than urbanites and then villagers in the (XaLLiF) variable, and rural migrants more than villagers and then urbanites in the (WaSSaL) variable.

It is also clear in Table 5.6 that the CA variants were

- used in the careful style more than the casual style in the (KaLLiM) and (WaSSaL) variables. The (XaLLiF) variable has one style;
- used the most when the sounds preceding the target vowel were dorsals, followed by labials and finally coronals in the (KaLLiM) variable; dorsals followed by coronals and finally labials in the (XaLLiF) variable, and labials followed by dorsals and finally coronals in the (WaSSaL) variable;
- used the most when the sounds following the target vowel were dorsals, followed by coronals and finally labials in the (KaLLiM) and (XaLLiF) variables, and coronals followed by dorsals and finally labials in the (WaSSaL) variable.

5.7.3 Interactions between social factors in (KaLLiM), (XaLLiF) and (WaSSaL)

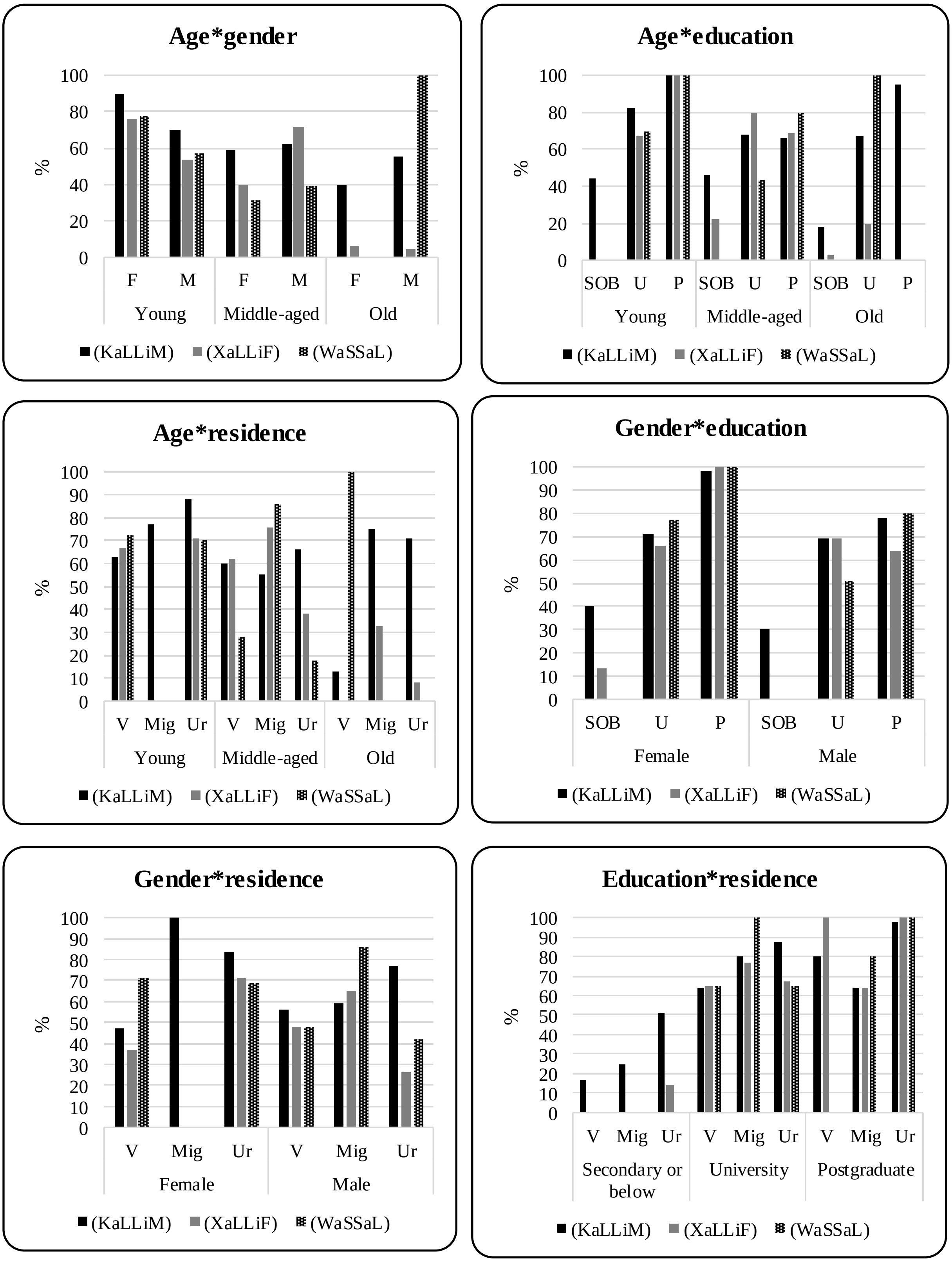
The hypothesis of the present study is that convergence on the CA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variables is led by young, highly-educated females living in towns (either born in town or rural migrants to any urban centre in Minya). This hypothesis means that there could be interactions between the four social factors investigated: gender, age, education, and place of residence. Table 5.7 shows all the possible interactions between the four social factors: age interacted with gender, age with education, age with place of residence, gender with education, gender with place of residence, and education with place of residence. Figure 5.6 makes it clear that there is variation reflected in the interactions and their combined effects on convergence on the CA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variables. This means that the 6 interactions are of interest and should be included in a maximal statistical analysis (see details below). It is not hypothesised that sounds preceding or following the target vowels will trigger use of the CA variants of any of the three variables. Neither is it hypothesised that style will have any significant effect.

5.7.4 Statistical analysis

***Table 5.7**: Interactions between the social factors of interest in convergence on the CA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variables*

Interaction			(KaLLiM)					(XaLLiF)					(WaSSaL)				
			Frequency			%		Frequency			%		Frequency			%	
			CA	MA	Total	CA	MA	CA	MA	Total	CA	MA	CA	MA	Total	CA	MA
Age*gender	Young	F	102	11	113	90	10	28	9	37	76	24	48	13	61	78	21
		M	63	27	90	70	30	14	12	26	54	46	17	13	30	57	43
	Middle-aged	F	26	18	44	59	41	4	6	10	40	60	4	9	13	31	69
		M	58	35	93	62	38	23	9	32	72	28	9	14	23	39	61
	Old	F	12	18	30	40	60	1	15	16	6	94	0	0	0		
		M	16	13	29	55	45	1	21	22	5	95	2	0	2	100	0
Age*education	Young	SOB	11	14	25	44	56	0	5	5	0	100	0	2	2	0	100
		U	108	24	132	82	18	33	16	49	67	33	57	24	81	70	30
		P	46	0	46	100	0	9	0	9	100	0	8	0	8	100	0
	Middle-aged	SOB	18	21	39	46	54	2	7	9	22	78	0	10	10	0	100
		U	39	18	57	68	32	16	4	20	80	20	9	12	21	43	57
		P	27	14	41	66	34	9	4	13	69	31	4	1	5	80	20
	Old	SOB	6	28	34	18	82	1	32	33	3	97	0	0	0		
		U	4	2	6	67	33	1	4	5	20	80	2	0	2	100	0
		P	18	1	19	95	5	0	0	0			0	0	0		
Age*residence	Young	V	32	19	51	63	37	20	10	30	67	33	39	15	54	72	28
		Mig	10	3	13	77	23	0	2	2	0	100	0	0	0		
		Ur	123	16	139	88	12	22	9	31	71	29	26	11	37	70	30
	Middle-aged	V	41	27	68	60	40	8	5	13	62	38	5	13	18	28	72
		Mig	12	10	22	55	45	16	5	21	76	24	6	1	7	86	14
		Ur	31	16	47	66	34	3	5	8	38	63	2	9	11	18	82
	Old	V	3	21	24	13	88	0	23	23	0	100	2	0	2	100	0
		Mig	3	1	4	75	25	1	2	3	33	67	0	0	0		
		Ur	22	9	31	71	29	1	11	12	8	92	0	0	0		
Gender*education	Female	SOB	23	35	58	40	60	3	20	23	13	87	0	9	9	0	100
		U	27	11	38	71	29	19	10	29	66	34	44	13	57	77	23
		P	40	1	41	98	2	11	0	11	100	0	8	0	8	100	0
	Male	SOB	12	28	40	30	70	0	24	24	0	100	0	3	3	0	100
		U	74	33	107	69	31	31	14	45	69	31	24	23	47	51	49
		P	51	14	65	78	22	7	4	11	64	36	4	1	5	80	20
Gender*residence	Female	V	22	25	47	47	53	13	22	35	37	63	32	13	45	71	29
		Mig	5	0	5	100	0	0	0	0			0	0	0		
		Ur	113	22	135	84	16	20	8	28	71	29	20	9	29	69	31
	Male	V	54	42	96	56	44	15	16	31	48	52	14	15	29	48	52
		Mig	20	14	34	59	41	17	9	26	65	35	6	1	7	86	14
		Ur	63	19	82	77	23	6	17	23	26	74	8	11	19	42	58
Education*residence	Secondary or below	V	7	34	41	17	83	0	24	24	0	100	0	3	3	0	100
		Mig	1	3	4	25	75	0	2	2	0	100	0	0	0		
		Ur	27	26	53	51	49	3	18	21	14	86	0	9	9	0	100
	University	V	49	28	77	64	36	26	14	40	65	35	46	25	71	65	35
		Mig	8	2	10	80	20	10	3	13	77	23	2	0	2	100	0
		Ur	94	14	108	87	13	14	7	21	67	33	20	11	31	65	35
	Postgraduate	V	20	5	25	80	20	2	0	2	100	0	0	0	0		
		Mig	16	9	25	64	36	7	4	11	64	36	4	1	5	80	20
		Ur	55	1	56	98	2	9	0	9	100	0	8	0	8	100	0

F= female, M=male, SOB= secondary or below, U= university, P= postgraduate, V= villager, Mig= migrant, Ur= Urbanite



F=emale, M=male, SOB= secondary or below, U=university, P=postgraduate, V=villager, Mig=migrant, Ur=urbanite

Figure 5.6: *Interactions between the social factors of interest in convergence on the CA variants of the (KaLLiM), (XaLLiF) and (WaSSaL) variables*

5.7.4.1 Protocol of statistical analysis and model selection

In the analysis of the (KaLLiM), (XaLLiF) and (WaSSaL) datasets, mixed-effects maximal logistic regression analysis (see section 3.3.4) was carried out via the *glmer* function in the *lmer* package (Bate, Maechler, Bolker & Walker, 2015) in R (R Project for Statistical Computing, 2015). The regression analysis was designed to check the contribution of social and linguistic factors to the probability of using the CA variants of the three variables. To carry this out properly, the following steps were followed in order: 1) structuring fixed and random effects, 2) designing the maximal model, and 3) selecting the best fit (model) to explain the variance in the data. These steps were adapted from Baayen (2008), Zuur, Ieno, Walker, Saveliev, & Smith (2009), Barr, Levy, Scheepers, & Tily (2013), and Winter (2014) as summed up in Al-Hashmi (2016).

5.7.4.1.1 Structure of fixed and random effects

Based on the hypothesis stated above, the factors of interest are `gender`, `age`, `education` and `residence`. Therefore, these factors will be tested as the social fixed effects in the regression analysis. The levels of the effects investigated are as follows:

- `gender`: `female` and `male` (with `female` as the default/reference level)
- `age` is an ordinal factor, meaning that an old person was previously middle-aged and young before that; thus, `age` was re-levelled as `young` (the default level), `middle-aged` and `old`.
- `education` is also an ordinal factor and, therefore, was re-levelled as `secondary or below` (the default level), `university` and `postgraduate`.
- `residence` is another ordinal factor because migrants are originally villagers; thus, `residence` was re-levelled as `villager` (the default level), `migrant` and `urbanite`.

The linguistic fixed effects include `style` and `sounds preceding` and `following` the target vowels in the three variables studied. These effects have the following levels:

- `style`: `careful` and `casual` (with `careful` as the default level)
- `preceding_sound` and `following_sound`: `coronal`, `dorsal` and `labial` (with `coronal` as the default level)

All the social factors are *between-speaker* and *within-item*; namely, they do not vary within the same speaker but vary within the same item. For example, no speaker can be a male and a female at the same time, while male and female speakers may use the same item. The same applies to the other social factors (`age`, `education` and `residence`). Likewise, all the linguistic factors except `style` are *between-item* and *within-speaker*; namely, they do not vary within the same item but vary within the same speaker. Consequently, no sound can be coronal and dorsal, coronal and labial, or dorsal and labial at the same time, but a coronal sound preceding and/or following the target vowel can be used by young, middle-aged and old speakers at the same time. `Style` alone is *within-speaker* and *within-item*; careful and casual styles can be used by villagers and urbanites at the same time and the same item can be used in the two styles.

The random effects in the three datasets include `item` and `speaker`. To check the variance in the two random effects, a null model including only the intercept/constant was run for each dataset as follows:

```
m0.null.kallim <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
kallim, family = "binomial”)
m0.null.xallif <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
xallif, family = "binomial”)
m0.null.wassal <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
wasaal, family = "binomial”)
```

The results of these null models (see Table 5.8 below) show that the variability in the three datasets is attributed to `item` and `speaker`, though differently. In the (KaLLiM) dataset, the `item` intercept variance is estimated at 578.60 and the `speaker` intercept variance is 24.16.

The total variance is therefore 578.60 + 24.16 = 602.76. The variance partition coefficient (VPC) (Steele, 2008) for `item` is 578.60/602.76 = 0.9599 and for `speaker` is 24.16/602.76 = 0.0400, which indicates that about 96% of the variance in the response variable can be attributed to `item` and about 4% to `speaker`. Similarly, in the (WaSSaL) dataset, the `item` intercept variance is estimated at 1740.8 and the `speaker` intercept variance at 100.6, with the total variance 1841.4. The VPC for `item` is 1740.8/1841.4=0.9453 and for `speaker` is 100.6/1841.4=0.0546. This means that about 94.5% of the variance is attributed to `item` but no more than 5.5% to `speaker`. In contrast, in the (XaLLiF) dataset, the `item` intercept variance is 1.32 and that of `speaker` is 15.72, with the total variance 17.04. Thus, the VPC for `item` is 1.32/17.04 = 0.077 and for `speaker` is 15.72/17.04 = 0.922. This means that about 7.8% of the variance in the response variable is attributed to `item`, while that attributed to `speaker` is about 92.2%.

***Table 5.8**: Summary of the null models for the (KaLLiM), (XaLLiF) and (WaSSaL) variables*

Variable	Intercept	Variance	Total variance	VPC	Observations	Speakers	Items
(KaLLiM)	item	578.60	602.76	96%	399	62	239
	speaker	24.16		4%			
(XaLLiF)	item	1.32	17.04	7.8%	143	30	114
	speaker	15.72		92.2%			
(WaSSaL)	item	1740.8	1841.4	94.53%	129	22	49
	speaker	100.6		5.46%			

5.7.4.1.2 Designing the maximal model

The three vowel datasets were analysed via mixed-effects logistic regression analysis fitted through random-slope models or maximal models (see details in 4.6.3.2). The maximal models designed for the three datasets are:

- All the fixed effects of interest; that is, `gender`, `age`, `education`, `residence`, `style`, `preceding_sound` and `following_sound`. Any fixed effect of no interest as justified by the research questions and/or hypotheses was excluded;

- All possible interactions between the fixed effects as justified by the hypothesis explained above (i.e. convergence on CA in Minya is led by young, highly-educated females living in town). These included: `age:gender`, `age:education`, `age:residence`, `gender:education`, `gender:residence` and `education:residence`;
- All random effects, random intercepts and random slopes[36]: `(1 + style + preceding_sound + following_sound | speaker)` and `(1 + age + gender + education + residence + style| item)`.

  `Style` was removed from the (XaLLiF) dataset as a fixed effect and random slope, as there is only one style in this dataset.
- To simplify the models so that they could deal with anticonservative and non-convergence issues, the number of iterations was increased to 2e5 through adding `(control=glmerControl(optCtrl=list(maxfun=2e5))`.

The model structure above led to the following three maximal models:

```
Max.kallim <- glmer (convergence ~ age + gender + education + residence +
age:gender + age:education + age:residence + gender:education +
gender:residence + education:residence + style + preceding_sound +
following_sound + (1 + style + preceding_sound + following_sound | speaker)
+ (1 + age + gender + education + residence + style| item), data=kallim,
family='binomial', control =glmerControloptimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

```
Max.xallif <- glmer (convergence ~ age + gender + education + residence +
age:gender + age:education + age:residence + gender:education +
gender:residence + education:residence + preceding_sound + following_sound
+ (1 + preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence |item), data = xallif, family='binomial', control
=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ = 1))
```

```
Max.wassa1 <- glmer (convergence ~ age + gender + education + residence +
age:gender + age:education + age:residence + gender:education +
gender:residence + education:residence + style + preceding_sound +
```

36 The structure of random slopes above is based on advice given in Baayen (2008), who recommends that "predictors tied to subjects (age, sex, handedness, education level, etc.) may require by-item random slopes, and predictors related to items (frequency, length, number of neighbors, etc.) may require by-subject random slopes" (p. 290).

```
following_sound + (1 + style + preceding_sound + following_sound | speaker)
+ (1 + age + gender + education + residence + style| item), data = wassal,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

It should be mentioned here that the researcher expected that some or all of these maximal models would not work because of the limited numbers of tokens for each variable, especially the (WaSSaL) variable, since there were only 129 observations. Maximal models with many effects and interactions need big datasets to converge.

5.7.4.1.3 Selecting the best model to explain the variance in the data

To select the best model with the best fit, the maximal model was fitted first. Then, the `dropterm` function in the `MASS` package (Venables & Ripley, 2002) was used to simplify the maximal model so as to get rid of the non-significant predictors. When the last (reduced model) was reached, the `anova` function in the `car` package (Fox & Weisberg, 2011) was run to compare between the maximal and reduced models. The model with the lowest AIC, BIC and p-value was selected as the best fit to explain the variance in the data. To make sure the `anova` results were right, the `somers2` function in the `Hmisc` (Harrell, Dupont, & et al., 2016) package was also used. The `somers2` function is a "rank correlation between predicted probabilities and observed responses" (Baayen, 2008, p. 224) and it is recommended by Tagliamonte (2011) when comparing between different models. The model with the highest C value is the one with the higest level of fit.

5.7.4.2 Statistical results of (KaLLiM)

The maximal model `Max.kallim` designed above was fitted but it did not work and it was therefore simplified by running different models. In the first model, one interaction was removed; in the second, 2 interactions; in the third, 3 interactions; in the fourth, 4 interactions; in the fifth, 5 interactions; and in the sixth, 6 interactions. These six models were fitted together, keeping all 8 random slopes (see all models in Appendix 4). Then, the sixth model (`Max.kallim.6`) was re-fitted by removing the random slopes one after another until only the most important slope (1+education|item) was left in model Max.kallim.13 with no interactions at all. This model yielded results. Then, interactions were added, first (gender:age) as in Max.kallim.14, and then (education:residence) as in Max.kallim.15. A third interaction was added (age:education), but the model did not converge. The third interaction was replaced by all the other interactions, one after another, but no model with more than two interactions worked. The result is that the only maximal model that converged is the one with no more than two interactions and no more than one random slope. Therefore, Max.kallim.15 was considered the maximal model, the results of which are given in Table 5.9.

```
Max.kallim.15 <- glmer (convergence ~ age*gender + education*residence +
style + preceding_sound + following_sound + (1 | speaker) + (1 + education
| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

Table 5.9: *Contribution of social and linguistic factors to the probability of MA speakers' convergence on the CA variants of the (KaLLiM) variable in model* `Max.kallim.15`

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**	
(**Intercept**)	-0.853953	1.120968	-0.762	0.4462	
agemiddle-aged	-1.476968	0.946323	-1.561	0.1186	
ageold	-2.579624	1.232176	-2.094	0.0363	*
gendermale	-0.675824	0.688358	-0.982	0.3262	
educationuniversity	2.039036	0.990935	2.058	0.0396	*
educationpostgraduate	3.302433	1.490817	2.215	0.0267	*
residencemigrant	-0.368882	1.778806	-0.207	0.8357	
residenceurbanite	1.475276	0.965572	1.528	0.1265	
stylecasual	-0.181246	0.461156	-0.393	0.6943	
preceding_sounddorsal	1.008852	0.447063	2.257	0.0240	*
preceding_soundlabial	0.877717	0.610367	1.438	0.1504	
following_sounddorsal	1.120813	0.604718	1.853	0.0638	.
following_soundlabial	-0.001078	0.429562	-0.002	0.9980	
agemiddle-aged:gendermale	0.697185	1.153801	0.604	0.5457	
ageold:gendermale	1.061149	1.443034	0.735	0.4621	
educationuniversity:residencemigrant	2.329629	2.223157	1.048	0.2947	
educationpostgraduate:residencemigrant	-0.001238	2.165401	-0.001	0.9995	
educationuniversity:residenceurbanite	0.325138	1.193676	0.272	0.7853	
educationpostgraduate:residenceurbanite	1.538678	1.937510	0.794	0.4271	
Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**					

As is clear in Table 5.9, only age, education and preceding_sound are significant factors in causing convergence from the MA variants on the CA variants of the

(KaLLiM) variable. Regarding `age`, the `young` level has the default estimate `0`. Compared to this, the `middle-aged` and `old` levels have the respective negative estimates `-1.476968` and `-2.579624` – but the difference between the `young` and `middle-aged` is not statistically significant, as confirmed by the p-value `0.1186`, while the difference between the `young` and `old` is significant, as shown by the p-value `0.0363*`. This shows a positive correlation: the younger the speaker, the more convergence on the CA variants of the (KaLLiM) variable. As for the `preceding_sound`, compared to the `coronal` level which has the default estimate 0, the `dorsal` and `labial` levels have the respective positive estimates `1.008852` and `0.877717`. The difference between `dorsals` and `coronals` is significant, as confirmed by the p-value `0.0240*`, while that between `labials` and `dorsals` is non-significant, as shown by the p-value `0.1504`. No interaction is significant in triggering the convergence.

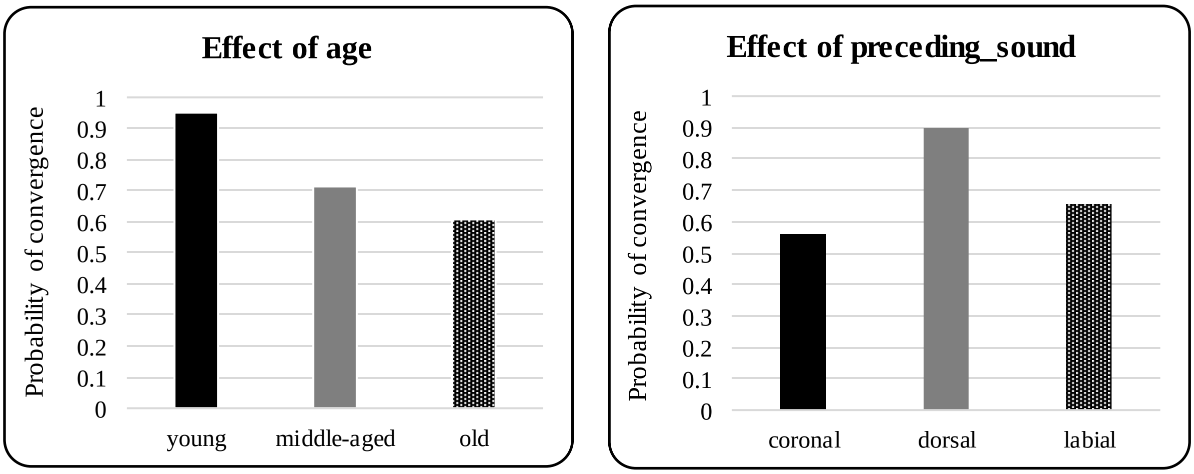


***Figure 5.7**: Effects of `age` and the `sounds preceding` the (KaLLiM) variants on the probability of MA speakers' convergence on the CA variants in model `Max.kallim.15`*

To check which of the other factors may be significant, but for which significance is blurred by being tested with other factors, the `dropterm` function was used to reduce the maximal model, `Max.kallim.15`, to a model that contains only the significant factors and, thus, the ones responsible for the response variable (i.e. convergence on CA). After each dropterm function was run, the results showed the significance expressed by Pr(Chi), and the factor with the highest Pr(Chi) value (i.e. least significant) was removed in the updated model. The same was repeated until the model with only significant factors was reached.

The (KaLLiM) dataset required running the dropterm function 7 times and updating the model 7 times, from Redu.kallim.1 to Redu.kallim.7. All the results of models Redu.kallim.1 to Redu.kallim.6 are given in Appendix 4. The results of the last model, Redu.kallim.7, which tests the effects of education + residence + (1|speaker) + (1+ education|item), are given in Table 5.10.

Table 5.10*: Contribution of education and residence to the probability of MA speakers' convergence on the CA variants of the (KaLLiM) variable in model Redu.kallim.7*

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**
(**Intercept**)	-2.4231	0.6882	-3.521	0.00043 ***
educationuniversity	3.3775	0.8239	4.099	4.14e-05 ***
educationpostgraduate	4.1843	0.9940	4.210	2.56e-05 ***
residencemigrant	0.4746	0.8559	0.555	0.57922
residenceurbanite	2.4027	0.5872	4.092	4.28e-05 ***
Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**				

Table 5.10 shows that education and residence are more significant than all the other predictors in causing convergence from MA on CA as regards the (KaLLiM) variable. Though age and preceding_sound were found significant in the Max.kallim.15 model, while residence was not significant in the same model, dropping the other non-significant predictors led to uncovering the significance of residence in the reduced model (*Redu.kallim.7*). As for education, compared to the secondary or below level of education which has the default estimate 0, the university and postgraduate levels have the respective positive estimates 3.3775 and 4.1843, with the respective p-values 4.14e-05*** and 2.56e-05***. This shows very significant differences between the education levels and reveals a positive correlation: the higher the educational level, the higher the convergence from MA on the CA variants of the (KaLLiM) variable. As regards

residence, compared to the villager level which has the default estimate 0, the migrant level has the positive estimate 0.4746, but this difference is not statistically significant, as confirmed by the non-significant p-value 0.57922. In contrast, the positive estimate of the urbanite level 2.4027 with the high p-value 4.28e-05*** shows a statistically significant difference between urbanites and villagers in Minya in their convergence on the CA variants of the (KaLLiM) variable. This also shows that convergence is led by urbanites, followed by migrants and finally by villagers.

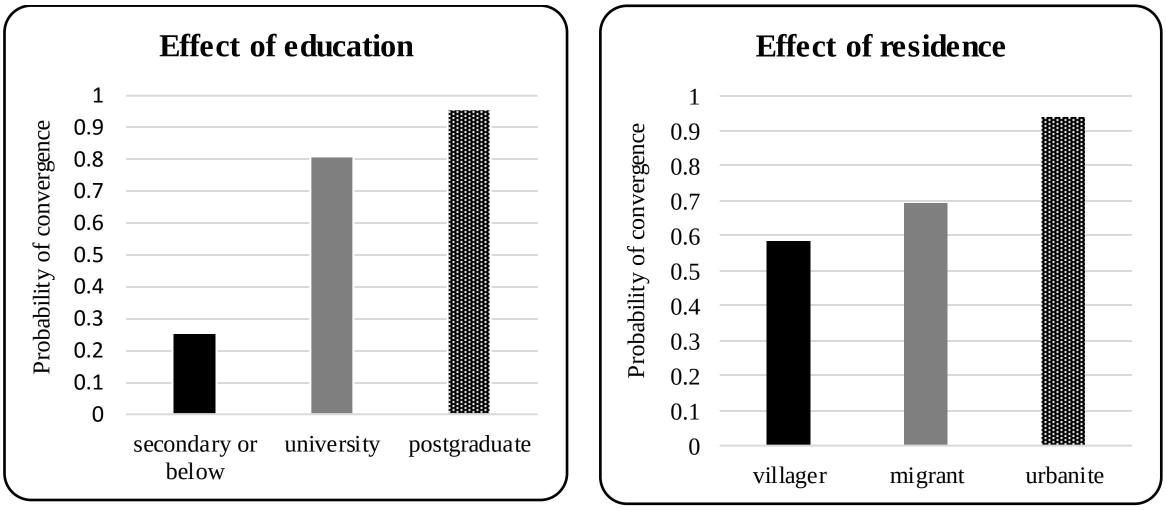


Figure 5.8*: Effects of* education *and* residence *on the probability of MA speakers' convergence on the CA variants of the (KaLLiM) variable in model* Redu.kallim.7

Comparing the maximal model (Max.kallim.15) to the reduced one (Redu.kallim.7) via the anova function showed the following:

```
                 Df    AIC    BIC  logLik  deviance  Chisq Chi Df Pr(>Chisq)
Redu.kallim.7    12 375.08 422.95 -175.54   351.08
Max.kallim.15    26 385.13 488.84 -166.56   333.13   17.948     14    0.2091
```

The AIC and BIC of Redu.kallim.7, the reduced model, are lower than those of Max.kallim.15, and this shows that the reduced model is better in explaining the variance in the dataset. To make sure that this result is right, the two models were also compared via the somers2 function, as follows:

```
probs = 1/(1+exp(-fitted(Max.kallim.15)))
somers2(probs, as.numeric(kallim$convergence)-1)
      C         Dxy           n     Missing
  0.9112120   0.8224241 399.0000000   0.0000000

probs = 1/(1+exp(-fitted(Redu.kallim.7)))
somers2(probs, as.numeric(kallim$convergence)-1)
      C         Dxy           n     Missing
 0.9215097   0.8430195 399.0000000   0.0000000
```

Here, the C and Dxy values of the reduced model are higher than those of the maximal model, thereby showing that the reduced model is the best fit.

5.7.4.3 Statistical results of (XaLLiF)

The maximal model (`Max.xallif`) designed for the (XaLLiF) variable did not work either. Different models, thus, were fitted. First, interactions were removed one after another until all were removed, keeping all the random slopes, but no model (from `Max.xallif.1 to Max.xallif.6`) worked (see all models in Appendix 4). Then, model `Max.xallif.6` was re-fitted following the removal of the random slopes one after another until only the slope of interest `(1+education|item)` remained in model `Max.xallif.11` with no interactions at all. This model yielded results. Then, the interaction between age and gender (`age:gender`) was added and the model worked. Another interaction was added (`education:residence`), but the model did not converge. The latter interaction was replaced by all the other interactions one after another, but no model with more than one interaction (`age:gender`) worked. Therefore, the model that yielded results with one interaction and one random slope (`Max.xallif.12`) was considered the maximal model, the results of which are given in Table 5.11.

```
Max.xallif.12 <- glmer (convergence ~ age*gender + education + residence +
preceding_sound + following_sound + (1 | speaker) + (1 + education | item),
data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

As is clear in Table 5.11, only `education` is significant. Compared to the secondary or below level which is the default level with the default estimate 0, the university and postgraduate levels have very close positive estimates at 17.1368 and 17.3696 respectively. These big differences from the default level are statistically significant, as confirmed by the university p-value 0.0497* and that of postgraduate 0.0390*. This demonstrates the sizable role of education in causing convergence on CA in Minya.

Table 5.11: *Contribution of social and linguistic factors to the probability of MA speakers' convergence on the CA variants of the (XaLLiF) variable in model Max.xallif.12*

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-15.0585	8.6766	-1.736	0.0826	.
agemiddle-aged	-4.8245	3.9874	-1.210	0.2263	
ageold	4.1315	9.9939	0.413	0.6793	
gendermale	-0.8628	1.8811	-0.459	0.6465	
educationuniversity	17.1368	8.7302	1.963	0.0497	*
educationpostgraduate	17.3696	8.4145	2.064	0.0390	*
residencemigrant	3.0707	2.6274	1.169	0.2425	
residenceurbanite	2.8809	1.9541	1.474	0.1404	
preceding_sounddorsal	1.8890	6.8071	1.159	0.2465	
preceding_soundlabial	-1.8929	1.0949	-1.729	0.0838	.
following_sounddorsal	-1.1095	2.0044	-0.554	0.5799	
following_soundlabial	-1.8642	0.9806	-1.901	0.0573	.
agemiddle-aged:gendermale	3.7095	4.7459	0.782	0.4344	
ageold:gendermale	-8.3319	10.7850	-0.772	0.4398	
Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**					

In order to check whether any other factor is significant if other insignificant factors are removed from the maximal model, the dropterm function was used to reduce the model to a model that contains only the significant factors. After each dropterm function was run, the factor with the highest Pr(Chi) value (i.e. least significant) was removed from the updated model. This was repeated until the model with only significant factors was reached.

The (XaLLiF) dataset required running the dropterm function 6 times and updating the model 6 times, from Redu.xallif.1 to Redu.xallif.6. All the results of models Redu.xallif.1 to Redu.xallif.5 are given in Appendix 4. The results of the last model, `Redu.xallif.6`, which tests the effects of `education + (1 | speaker) + (1 + education | item)`, are given below.

***Table 5.12**: Contribution of* `education` *to the probability of MA speakers' convergence on the CA variants of the (XaLLiF) variable in model* `Redu.xallif.6`

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-10.161	3.901	-2.605	0.00919	**
educationuniversity	11.115	3.981	2.792	0.00524	**
educationpostgraduate	13.720	4.528	3.030	0.00245	**
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

As is clear in Table 5.12, reducing the model revealed the positive correlation between education and convergence: the higher the educational level, the higher the convergence on the CA variants of the (XaLLiF) variable. This is confirmed through the different estimates of the `university` and `postgraduate` levels of `education` in the reduced model, `Redu.xallif.6`, compared to the highly similar estimates of the same levels in the maximal model, `Max.xallif.12`. In the reduced model, the `university` and `postgraduate` levels have the respective positive estimate `11.115` and `13.720` compared to the default estimate `0` of the default level `secondaryorbelow`. These differences are also significant, as confirmed by the p-values of `university` (`0.00524**`) and `postgraduate` (`0.00245**`).

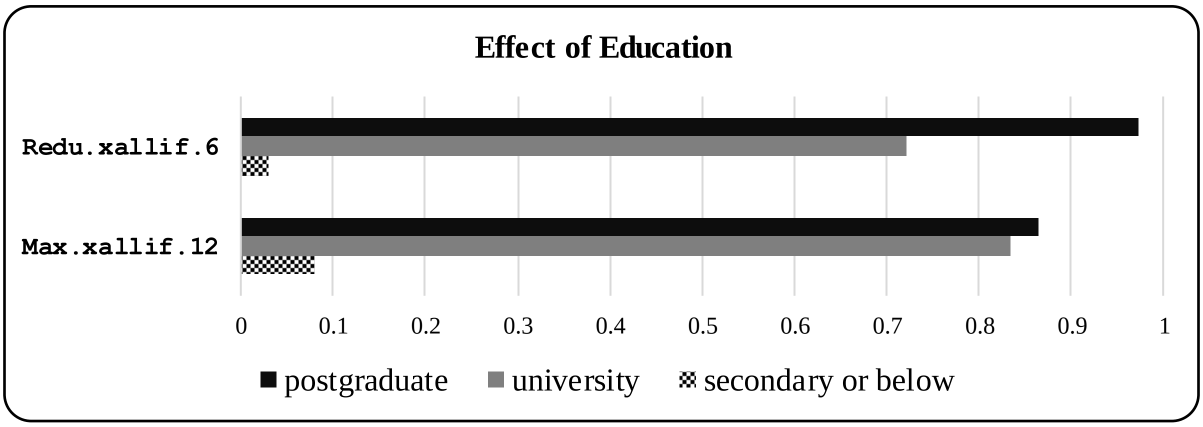


***Figure 5.9**: Effect of* `education` *on the probability of MA speakers' convergence on the CA variants of the (XaLLiF) variable in the maximal model,* `Max.xallif.12`*, and the reduced model,* `Redu.xallif.6`

The reduced model was compared to the maximal model via the `anova` function, and the former was found better, as is clear from its lower AIC and BIC.

```
                Df   AIC    BIC  logLik deviance  Chisq Chi Df Pr(>Chisq)
Redu.xallif.6   10 128.47 158.09 -54.233  108.465
Max.xallif.12   21 134.72 196.94 -46.358   92.717 15.748     11     0.1507
```

The two models were also compared through the `somers2` function, which also showed that the reduced model is better, as confirmed by its higher C and Dxy values.

```
probs = 1/(1+exp(-fitted(Max.xallif.12)))
somers2(probs, as.numeric(xallif$convergence)-1)
      C           Dxy         n           Missing
  0.9720266   0.9440532   143.0000000   0.0000000
probs = 1/(1+exp(-fitted(Redu.xallif.6)))
somers2(probs, as.numeric(xallif$convergence)-1)
     C            Dxy         n             Missing
0.9778951     0.9557903   143.0000000     0.0000000
```

5.7.4.4 Statistical results of (WaSSaL)

Here again, the maximal model designed above did not work and other models had to be fitted. Because of the very small number of observations in the (WaSSaL) dataset (only 129 observations), no model with any interaction or random slope worked. All interactions were removed one after another, while keeping all the random slopes, but no model worked. Then, all the random slopes were removed one after another, but no model (from `Max.wassal.1 to Max.wassal.12`) worked either. Then, the model that included all the fixed effects (social and linguistic) and random effects, but with no interactions or random slopes (`Max.wassal.13`) was considered the maximal model. Its results are given in Table 5.13.

```
Max.wassal.13 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 | item),
data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

As is clear in Table 5.13, all factors are significant except `residence` and `style`. As for `age`, the `middle-aged` level has the negative estimate `-3.2698`, while the `old` level has the positive estimate `2.7358`, compared to the default estimate of the `young` level, which is 0. This means that the old converge on the CA variants of the (WaSSaL) variable the most, followed by the young, and finally the middle-aged. The difference between the middle-aged and the young is significant, as confirmed by the high p-value 2.10e-05***, while that between the old and young is not. In a similar way, the male level has the negative estimate -3.4312 compared to the default estimate 0 of the default level female. This difference between females and males is also significant, as confirmed by the high p-value 2.33e-05***, and it refers to the fact that females converge on the CA variants of the (WaSSaL) variable much more than do males in Minya. As regards education, the university and postgraduate levels have the respective positive estimates 4.3353 and 1.0950 compared to 0, the default estimate of the secondary or below level. While the difference between the university and secondary or below levels is significant, as confirmed by the p-value 0.0396*, the one between the secondary or below and postgraduate is not. This shows a non-positively correlated result, as found in the (KaLLiM) and (XaLLiF) variables (i.e. the higher the educational level, the higher the convergence on the CA variants).

Table 5.13 *Contribution of social and linguistic factors to the probability of MA speakers' convergence on the CA variants of the (WaSSaL) variable in model Max.wassal.13*

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**	
(**Intercept**)	-2.6153	7.2656	-0.731	0.4650	
agemiddle-aged	-3.2698	7.7194	-4.051	2.10e-05	***
ageold	2.7358	3.2263	0.057	0.9543	
gendermale	-3.4312	9.0846	-4.230	2.33e-05	***
educationuniversity	4.3353	9.6008	2.058	0.0396	*
educationpostgraduate	1.0950	5.5337	0.768	0.4427	
residencemigrant	3.0392	7.5781	1.012	0.3114	
residenceurbanite	-4.1516	6.4925	-0.639	0.5225	
stylecasual	1.5696	9.3679	1.662	0.0965	.
preceding_sounddorsal	2.0815	6.9872	1.157	0.2474	
preceding_soundlabial	7.9725	5.5080	4.577	1.73e-06	***
following_sounddorsal	-4.0359	8.6326	-4.048	2.18e-05	***
following_soundlabial	0.3037	8.6890	0.035	0.9721	

Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**

As regards the sounds preceding the target vowel variants in the (WaSSaL) variable, `labials` trigger use of the CA variants the most, followed by `dorsals` and finally by `coronals`. This is made clear from the positive estimates of `dorsals` and `labials`, `2.0815` and `7.9725` respectively, compared to `0`, the default estimate of the default level `coronals`. The difference between `labials` and `coronals` is significant, as verified by the high p-value `1.73e-06 ***`, but the difference between `coronals` and `dorsals` is non-significant. With respect to the sounds following the target vowel variants, the results are different. The CA variants are triggered the most by `labials`, followed by `coronals` and finally by `dorsals`, as is clear in their respective estimates: `0.3037`, `0` and `-4.0359`. The difference between `labials` and `coronals` is non-significant, while that between `coronals` and `dorsals` is significant, as is shown by the high p-value `2.18e-05***`.

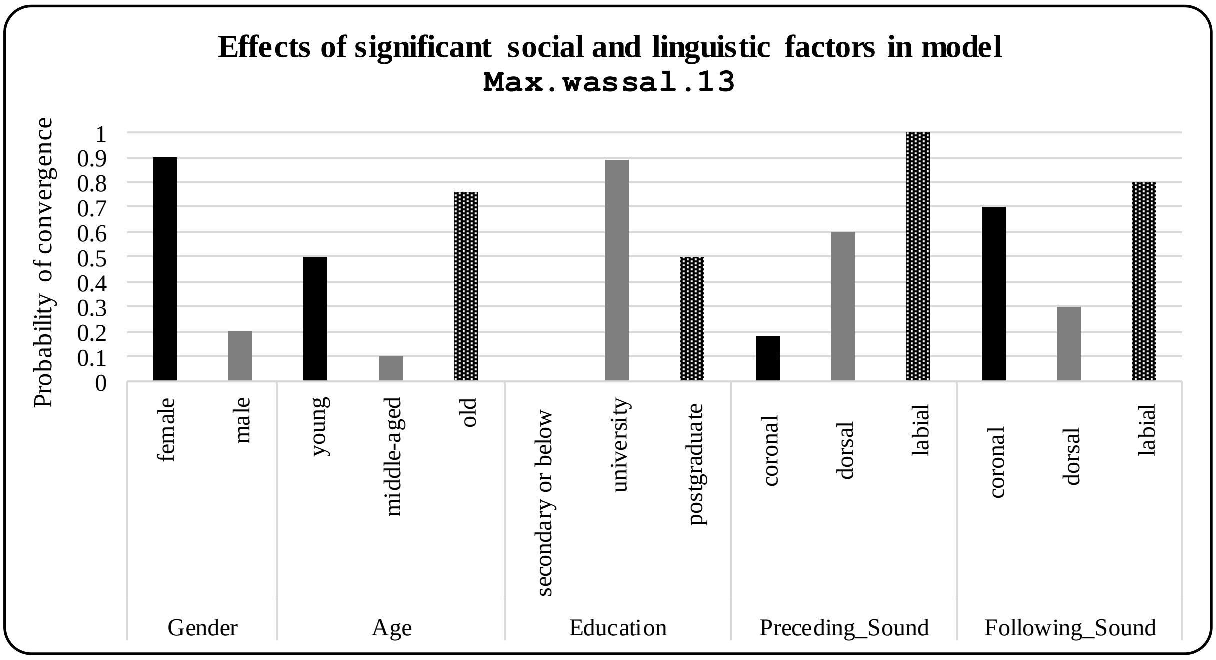


***Figure 5.10**: Effects of significant social and linguistic factors on the probability of MA speakers' convergence on the CA variants of the (WaSSaL) variable in the maximal model,* `Max.wassal.13`

So as to check the significance level of the other non-significant factors in model

Mas.wassal.13, and which of the significant factors is more responsible for variation in the response variable, the dropterm function was used to reduce the model. As with the two previous datasets, after each dropterm function was run, the factor with the highest Pr(Chi) value (i.e. least significant) was removed from the updated model, and the same procedure was repeated until the model with only significant factors was reached.

The (WaSSaL) dataset required running the dropterm function 5 times and updating the model 5 times, from Redu.wassal.1 to Redu.wassal.5. All the results of models Redu.wassal.1 to Redu.wassal.4 are given in Appendix 4. The results of the last model, Redu.wassal.5, which tests the effects of age + residence + (1 | speaker) + (1 | item), are given in Table 5.14.

Reducing the maximal model resulted in revealing the significance of residence, in addition to confirming the significance of age. It is odd here that education is not significant in the reduced model, Redu.wassal.5, as it is significant in all the previous models fitted to all datasets (q, KaLLiM, XaLLiF and even Max.wassal.13). This is probably a result of the very small number of observations in the current dataset.

Table 5.14*: Contribution of age and residence to the probability of MA speakers' convergence on the CA variants of the (WaSSaL) variable in model Redu.wassal.5*

	Estimate	**Std. Error**	**z value**	**Pr(>|z|)**	
(Intercept)	17.800	5.109	3.484	0.000494	***
agemiddle-aged	-5.760	9.558	-3.741	0.000183	***
ageold	2.054	4.349	0.382	0.702486	
residencemigrant	4.267	8.592	2.592	0.009556	**
residenceurbanite	-2.391	6.737	-0.355	0.722677	
Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**					

Table 5.14 shows that the old lead convergence on the CA variants of (WaSSaL), followed by the young, and finally the middle-aged. This is shown by the respective estimates of the three variables: 2.054, 0 and -5.760. While the difference between the old and young is non-significant, the difference between the young and middle-aged is

significant, as verified by the p-value `0.000183***`. This result is not much different from that of `age` in the maximal model. As for `residence`, `migrants` lead convergence, followed by `villagers` and finally by `urbanites`, as is clear in the respective estimates of `4.257`, `0` and `-2.391`. The difference between `migrants` and `villagers` is significant, as confirmed by the p-value `0.009556**`, while that between `villagers` and `urbanites` is non-significant.

The maximal model, `Max.wassal.13`, and the reduced model, `Redu.wassal.5`, were compared via the `anova` function, and results showed that the reduced model is a better fit, as confirmed by the lower AIC and BIC.

```
Redu.wassal.5:  convergence ~ age + residence + (1 | item) + (1 | speaker)
Max.wassal.13:  convergence ~ age + gender + education + residence + style +
preceding_sound + following_sound + (1 | item) + (1 | speaker)

               Df   AIC      BIC     logLik deviance Chisq Chi Df Pr(>Chisq)
Redu.wassal.5   7   71.651  91.669 -28.825   57.651
Max.wassal.13   15  73.370  116.267 -21.685  43.370   14.281  8   0.07474 .
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

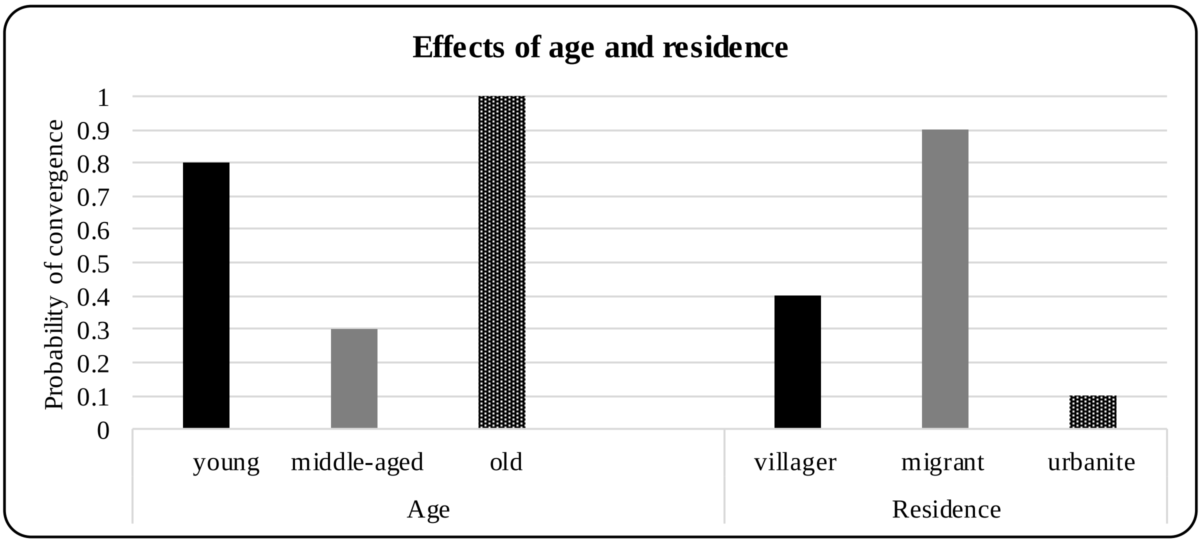


***Figure 5.11**: Effects of `age` and `residence` on the probability of MA speakers' convergence on the CA variants of the (WaSSaL) variable in the reduced model, `Redu.wassal.5`*

The two models were also compared via the `somers2` function, which showed that the reduced model is a better fit, as is clear from its bigger C and Dxy values.

```
probs = 1/(1+exp(-fitted(Max.wassal.13)))
somers2(probs, as.numeric(wassal$convergence)-1)
      C         Dxy           n     Missing
0.8652310   0.7728411 129.0000000   0.0000000
probs = 1/(1+exp(-fitted(Redu.wassal.5)))
somers2(probs, as.numeric(wassal$convergence)-1)
      C           Dxy         n           Missing
0.8832420   0.8126235 129.0000000   0.0000000
```

It should be made clear that these results are very different from the hypothesis of the study and observations of the researcher. They are also different from the results found for the other vocalic variables (dealt with in this chapter) and other variables (see the results of the (q) variable in Chapter 4 and the (stress) variable in Chapter 6), whereby `education` was found to be significant, with a positive correlation between the levels of education and convergence on CA (i.e. the higher the educational level, the higher the convergence on CA). As for `residence`, the results of the (WaSSaL) variable are also quite different from all the other variables in which, regardless of the significance level, convergence on CA was found to be led by `urbanites`, followed by `migrants`, and finally by `villagers`. The reason for these differences in the (WaSSal) variable may be the small number of observations and/or the lack of any random slope.

5.8 Conclusion

In this chapter, a modest attempt at showing vocalic variation in Arabic in general and in EA in particular was made. It was shown that vocalic differences are numerous in Arabic dialects and that they are understudied because they may be less salient than consonantal variation (Al-Wer, 2002b). Another reason for this has been suggested here: Arabic is a root-system language and conveying meaning largely depends on consonants rather than vowels. Thus, provided that the structure is understood, vocalic differences do not tend to cause a difference in meaning. Diglossic switching, furthermore, may make detecting vocalic variation difficult.

The focus of this chapter was on the similarities and differences between CA and MA, how CA vowels have diffused to MA, and how MA speakers are converging on the CA variants. Although there are 28 vocalic differences outlined in this chapter, only three variables (all are FORM II and FORM V verbs and derivatives) have been investigated. This is due to their frequency and salience compared to other vocalic variables which may be equally salient but not equally frequent.

The results show that CA vocalic patterns are generally highly converged on by MA speakers. The effects of social and linguistic factors differ from one variable to another, but generally convergence is led by the highly-educated (postgraduates and university students/graduates) living in town (urbanites and rural migrants) in the careful style (picture questionnaire). No interaction between any two social factors investigated is significant in inducing convergence on CA vocalic patterns. More details regarding why MA speakers converge on CA in general will be provided in Chapter 7.

The results for the (KaLLiM) and (XaLLiF) variables are similar. Both variables confirm the significance of the educational level in triggering convergence on CA vowels (i.e. the higher the educational level, the higher the convergence). The results of the (WaSSaL) variable do not show this kind of significance attributed to education, but this could be because of the statistical issues with the (WaSSaL) dataset, i.e. a relatively small number of observations and the lack of any random slope in the statistical analysis.

Chapter Six: (stress)

6.1 Introduction

Variationist studies have largely been concerned with segmental variation (variation in consonants and vowels) at the expense of suprasegmental/prosodic variation (variation in stress, rhythm, intonation, etc.). In particular, variation in stress has been largely ignored in Arabic sociolinguistics in general, and this may be because of the great uniformity in word stress placement in most Arabic dialects. In Egypt, there is variation in word stress mainly because CA stress has some unique features, as will be clarified below. Because CA stress enjoys the prestige assigned to the dialect as a whole, many non-Cairenes try to adopt it. MA speakers are no exception in this regard. In this chapter, there is an attempt to shed light on some general patterns of word stress placement in Arabic dialects. Then, the similarities and differences in CA and MA word stress are shown, noting that there is hardly any literature to report or comment on. Finally, the research questions and hypotheses are given, followed by the results according to social as well as linguistic factors.

6.2 Word Stress in Arabic

6.2.1 Word stress in Arabic dialects

All Arabic dialects bear word stress, but differ in terms of stress placement (Watson, 2011). However, the differences are slight and, thus, stress placement can be predicted by reducing it to simple rules (Hellmuth, 2013). Stress placement in Arabic dialects depends on syllable weight and, except in Ṣan’āni Arabic (henceforth SA) (Watson, 2007), there are three syllable weights:

a) Light syllable (henceforth L) composed of a consonant and a vowel (CV), as in the two final syllables in /mad.ɾa.sa/ ‘*school*’.

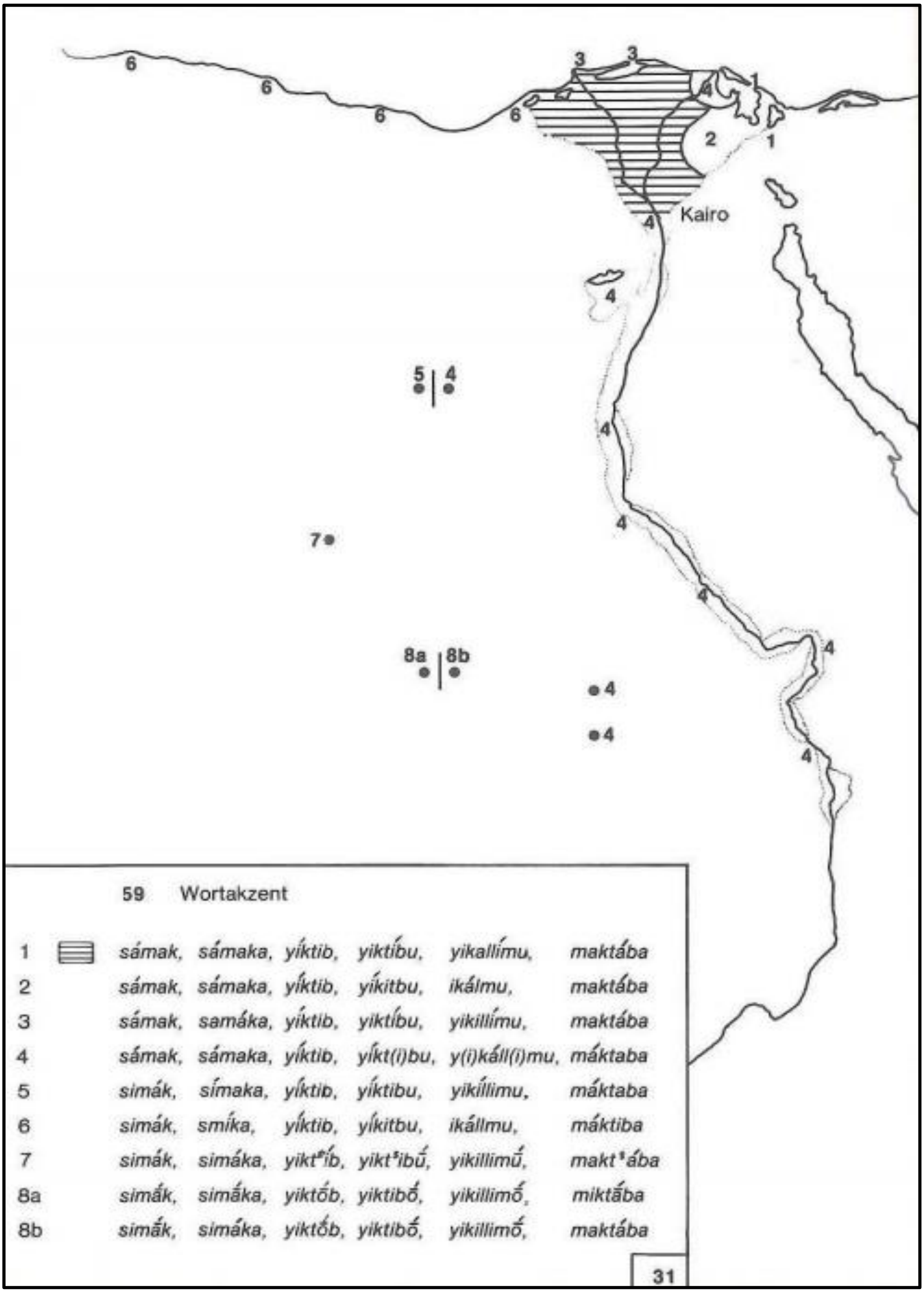
b) Heavy syllable (henceforth H) composed of a vowel between two consonants (CVC), as in the first syllable in /mak.ta.ba/ '*library*' or a consonant followed by two vowels (CVV), as in the final syllable in /ba.ʕu:/ '*they bought it* (masc.)'.

c) Superheavy syllable (henceforth SH) composed of a consonant followed by a vowel and then two consonants (CVCC), as in the final syllable in /da.rast/ '*I studied*', or two consonants with two vowels in between (CVVC) as in the final syllable in /kɪ.ta:b/ '*book*'.

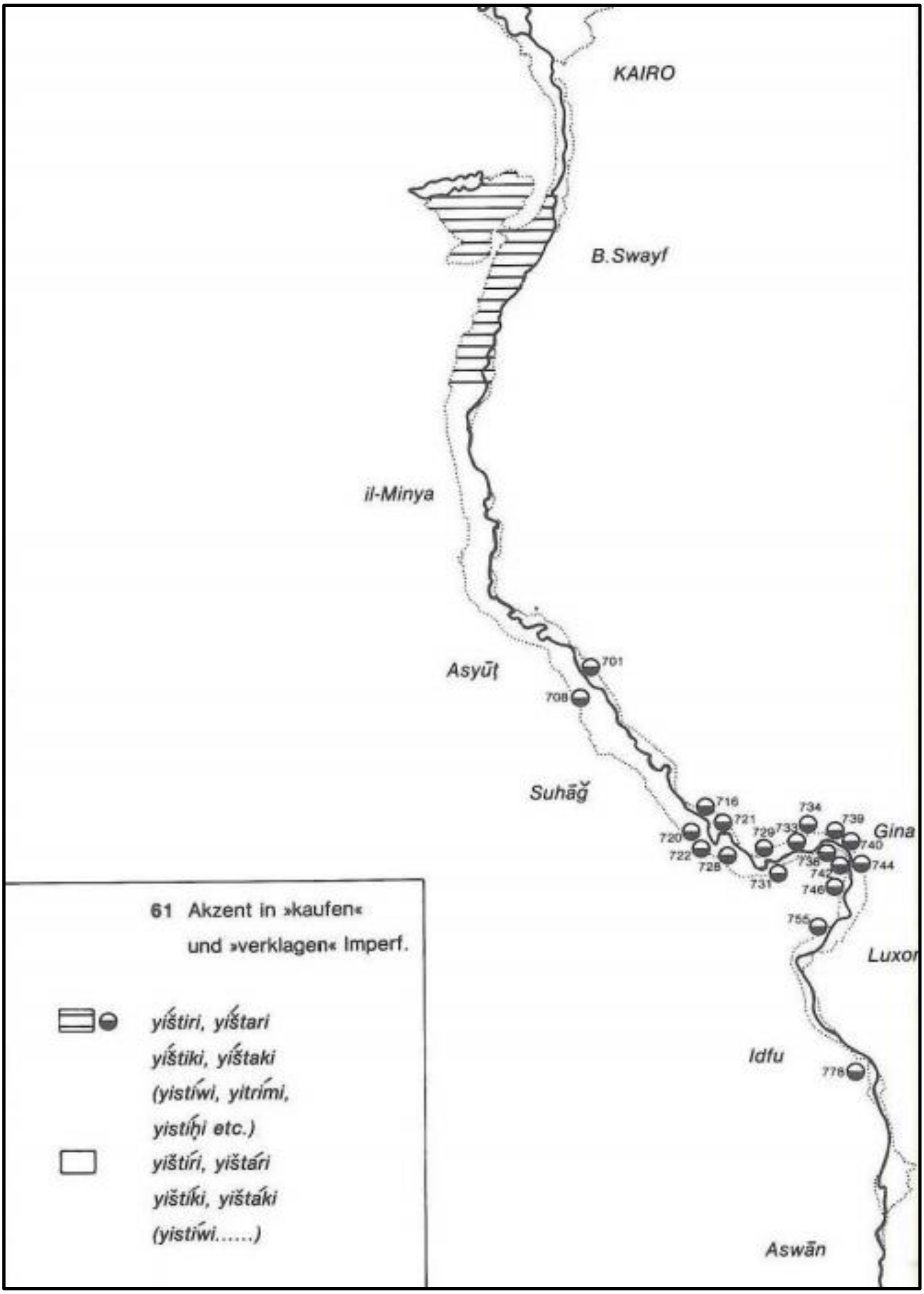
The general rule in Arabic dialects is to stress a final SH syllable as in [kɪˈta:b] '*book*' or [kaˈtabt] '*I wrote*'. If there is no SH syllable, the penultimate H syllable is stressed, as in [kɪˈtabna] '*our book*' and [kɪˈta:bi] '*my book*' (Kager, 2005). However, a final H (CVC) syllable is not stressed in any Arabic dialect except for SA. Accordingly, there is variation in word stress placement only in words without a final SH or penultimate H syllable (Hellmuth, 2013). The most noticeable example of stress variation is in HLL words, i.e. words with an H (CVC) antepenultimate syllable followed by two L syllables, as in /mak.ta.ba/ '*library*'. In this case, the first L syllable is stressed in CA [makˈtaba], while the antepenultimate H syllable is stressed elsewhere [ˈmaktaba].

6.2.2 Word stress in EA

Behnstedt and Woidich (1985) show the variation in word stress in EA in three maps (their Maps 59, 60 and 61). Discussing this variation in detail is beyond the scope of this study. Maps 59 and 61 are given below as Maps 6.1 and 6.2 respectively, since they show the similarities and differences between CA and MA stress. Map 6.1 shows that stress patterns 1 and 4 dominate EA. Stress pattern 1, which is also the CA stress as in [makˈtaba] '*library*', dominates most of the Delta. Stress pattern 4, as in [ˈmaktaba], can be called UEAr stress as it dominates Upper Egyptian dialects, including MA. The other patterns are spread across Bedouin-dominated areas (e.g. Marsa Matruh or Burullus) on the Mediterranean Sea and some oases in the Western Desert.



***Map 6.1**: Stress patterns in EA (Map 59 in Behnstedt & Woidich (1985))*



***Map 6.2**: Stress placement in some Form VII and Form VIII defective imperfect verbs in UEAr (Map 61 in Behnstedt & Woidich (1985))*

6.2.2.1 Word stress in CA

CA word stress has been studied in detail by, among others, Harrell (1957), Mitchell (1956), Borselow (1976), McCarthy (1979) and Watson (2007). The rules of CA stress can be summed up as follows:

1. Stress is placed on a final SH syllable, as in
   i. LSH: [kɪˈta:b] '*book*'
   ii. LSH: [kaˈtabt] '*I wrote*'
2. If there is no SH syllable, stress is placed on the final H syllable (only if composed of CVV), as in
   i. LH: [ɾaˈmu:] '*they threw it* (masc.)'
   ii. LH: [gaˈtoː] '*cake*'
3. Otherwise, stress is placed on the penultimate H syllable, as in
   i. LHL: [mʊˈdarɾɪs] '*teacher* (masc.)'
   ii. HHL: [fɪhˈmu:ha] '*they understood her*'
4. In words composed of or ending with LL syllables, the stress is placed on the penultimate syllable, as in
   i. LL: [ˈħaka] '*he told'*
   ii. HLL: [jɪtˈħɪki] '*it* (masc.) *is told'*
   iii. HLL: [ʔɪtˈħaka] '*it* (masc.) *was told'*
   iv. HLL: [jɪnˈtɪhi] '*it* (masc.) *is finished'*
   v. HLL: [ʔɪnˈtaha] '*it* (masc.) *was finished'*
   vi. HLL: [madˈɾasa] '*school*'
   vii. LHLL: [mʊdaɾˈɾɪsa] '*teacher* (fem.)'
   viii. HHLL: [mɪtħɑmˈmɑɾɑ] '*fried* (fem. sing.)'
5. In words composed of or ending with LLL syllables, the stress is placed on the

antepenultimate syllable, as in

i. LLL: [ˈtˤɑbɑxʊ] ‘*they cooked’*

ii. HLLL: [mʊxˈtalɪfa] ‘*different* (fem. sing.)’

iii. HLLL: [ʔɪtˈʕadamʊ] ‘*they were executed’*

6. But if the word composed of or ending with HLL syllables is a 3rd person fem. sing. perfect verb with an object suffix starting with a V(C) (and this is usually the [ʊ] suffix meaning ‘*him*’ or ‘*it*’), the stress is placed on the penultimate syllable, as in

    i. LLL: [ɾaˈmɪtʊ] ‘*she threw it* (masc.)’

    ii. LLLL: [kataˈbɪtʊ] ‘*she wrote it* (masc.)’

    iii. HLLL: [ʕɑwwɑˈɾɪtʊ] ‘*she hurt him*’

6.2.2.2 Word stress in MA

MA word stress, contrary to that of CA, has received very little attention. The only two works that have examined it are Doss (1981) and Behnstedt & Woidich (1985). In the latter work, there is no special focus on MA and, as mentioned above, only three maps deal with stress placement in 814 speech communities including cities, towns and villages. MA word stress rules are the same as those of CA except in 4 (vi, vii and viii) and 6 (i, ii & iii), as follows:

7. In words composed of or ending with HLL syllables, stress is placed on the antepenultimate syllable, as in

    i. HLL: [ˈmadɾasa] ‘*school*’

    ii. LHLL: [mʊˈdaɾɾɪsa] ‘*teacher* (fem.)’

    iii. HHLL: [mɪtˈħɑmmɑɾɑ] ‘*fried* (fem. sing.)’

As for 4 (ii, iii, iv and v), which are all HLL words, these are exceptions in MA. They belong to perfect and imperfect FORM VII (ii and iii) (cf. the verbs in Map 6.2) and FORM VIII (iv and v), and they are stressed the same in CA.

8. If the word composed of or ending with LLL syllables is a 3rd person fem. sing. perfect

verb with an object suffix starting with a V(C) (and this is usually the [ʊ] suffix meaning '*him*' or '*it*'), the stress is placed on the first syllable, as in

i. LLL: [ˈɾamatʊ] '*she threw it* (masc.)'

ii. LLLL: [ˈʕamalɪtʊ] '*she did it* (masc.)'

iii. HLLL: [ˈsˤɑwwɑɾɪtʊ] '*she photographed him*'

6.2.2.3 Word stress in CA and MA from a metrical perspective

Metrically, CA and MA share some similarities, leading them to have the same stress rules with some syllable weights. Both are consonant extrametrical; that is, the final H (CVC) syllable is considered L because the last C is regarded as invisible, while a non-final H (CVC) syllable is considered H. Likewise, the final SH (CVCC) syllable is considered H rather than SH (Watson, 2007). For example, in the last syllable of /ʕamalɪt/ '*she did*' in CA and MA, final C→ /t/ is extrametrical and, therefore, the whole word is seen metrically to be composed of /ʕa.ma.lɪ/, with the first two L syllables forming a (bimoraic) foot, the last L syllable /lɪ/ alone being unable to form a foot. Thus, stress is given to the head of the foot /ʕa/→ [ˈʕamalɪt].

The metrical difference between CA and MA that causes variations in stress rules is foot extrametricality (Hayes, 1995). Foot extrametricality is treating the final foot as invisible (Hellmuth, 2013). CA is not foot-extrametrical and, thus, the final foot is counted. For example, in /handasa/ '*engineering*', the first syllable /han/ is a foot, and the second and third L syllables (i.e.[dasa]) form another foot. Since the metrical stress rules of CA require assigning stress to the head of the rightmost foot (Watson, 2007), the word is stressed as [hanˈdasa]. This applies to all HLL words, whether they be completely composed of nothing but CVC.CV.CV, as in [madˈɾasa] '*school*' or occurring in a construction preceded by a prefix, as in [mɪtħɑmˈmɑɾɑ] '*fried* (fem. sing.). On the other hand, MA is foot-extrametrical, which means the final foot is considered invisible. Accordingly, the second foot in /handasa/ '*engineering*' (i.e. [dasa]) is not counted and the whole word is seen as composed of one foot /han/, which is assigned the stress [ˈhandasa].

The exceptions to this foot-extrametricality rule in MA are FORM VII and FORM VIII verbs (Doss, 1981), as in these examples:

a) FORM VII:

i. HLL: [jɪtˈʕamal] '*it* (masc.) *is done*'

ii. HLL: [ʔɪtˈʕamal] '*it* (masc.) *was done*'

iii. HLL: [jɪtˈmaħa] '*it* (masc.) *is destroyed*'

iv. HLL: [ʔɪtˈmaħa] '*it* (masc.) *was destroyed*'

b) FORM VIII

i. HLL: [jɪmˈtaħan] '*he examines*' or '*he is examined*'

ii. HLL: [ʔɪmˈtaħan] '*he examined*' or '*he was examined*'

iii. HLL: [jɪnˈtaha] '*it* (masc.) *is ended*'

iv. HLL: [ʔɪnˈtaha] '*it* (masc.) *ended*'

In these verbs, MA is not foot-extrametrical; here, the last two LL syllables are counted, form a foot and are stressed. Thus, these types of verbs are stressed in the same way in both CA and MA, although there may be differences in vowels (see Chapter 5).

Table 6.1 sums up the differences between CA and MA rules of word stress in terms of the syllable weights and gives the frequency of these weights in the data on which this study is based. As is clear, HLL is the most frequent weight. Since the other infrequent weights LHLL and HHLL also end with HLL, they were coded as HLL. As for LLLL tokens, 20 (0.71%) of them were counted in this study; but since they are very few compared to the HLL weight, they were disregarded, thereby reducing the number of tokens to 2779.

Table 6.1: *Distribution of syllable weights in the data*

Syllable weight	CA	MA	Translation	Number of items	%
HLL	[madˈɾasa]	[ˈmadɾasa]	*school*	2772	99.04
LHLL	[mʊdaɾˈɾɪsa]	[mʊˈdaɾɾɪsa]	*teacher (fem.)*	5	0.18
HHLL	[mɪtħamˈmɑɾɑ]	[mɪtˈħammɑɾɑ]	*fried (fem. sing)*	2	0.07
LLL	[ɾaˈmɪtʊ]	[ˈɾamatʊ]	*she threw it (masc.)*	0	0
LLLL	[kataˈbɪtʊ]	[ˈkatabɪtʊ] or [ˈkɪtɪbɪtʊ]	*she wrote it (masc.)*	20	0.71
HLLL	[ʕawwɑˈɾɪtʊ]	[ˈʕawwɑɾɪtʊ]	*she hurt him*	0	0
Total				2799	100

6.3 Literature Review and Research Questions

To the best of the researcher’s knowledge, no sociolinguistic study has dealt with variation in stress so far. Miller (2005) aimed at measuring how far seven Upper-Egyptian migrants (from areas UE1 and UE2 in Sohag Governorate, see Map 1.2) living in Cairo accommodated to CA. She examined the variation in 21 variables. Although stress was mentioned as a feature distinguishing CA from UEAr (p. 920), it was not quantified in the data that Miller selected. To fill this gap, the present study examines the diffusion of CA stress and how it is reacted to in Minya.

The study aims to answer the following research questions:

1. How much are MA speakers accommodating to CA stress?
2. Who in Minya is converging on CA stress, and who is diverging away from it, in terms of gender, age, education and place of residence?
3. Why are MA speakers converging or diverging?
4. What are the associations with CA stress and MA stress in Minya?

It is hypothesised that CA stress has diffused to Minya, and that it is highly converged on, especially by young, highly-educated females living in urban centres.

6.4 Results

6.4.1 Distribution of CA and MA stress by social and linguistic factors

Analysing the data yielded 2779 items, with a mean of 44.8 items per participant. CA stress was used in 72.5% of the tokens, while MA stress was used in 27.5% of them. The distribution of MA and CA stress in relation to social and linguistic factors is given in Table 6.2, which shows that:

- females used CA stress slightly more than males;
- CA stress was used the most by young speakers, followed by middle-aged and finally by old speakers, thereby showing a correlation between age and convergence on CA stress (i.e. the younger the speaker, the greater the convergence);
- CA stress was used the most by postgraduates, followed by university students/graduates, and finally by those with a secondary or below level of education, thus showing another correlation (similar to the one between age and convergence) between education and convergence on CA stress (i.e. the higher the educational level of the speaker, the greater the convergence);
- migrants used CA stress slightly more than urbanites, and both of these groups used it more than villagers; and
- the careful style triggered the use of CA stress more than the casual one, proving that paying attention to speech gives speakers a greater opportunity to converge on CA more successfully.

Table 6.2*: Distribution of CA and MA stress by social and linguistic factors*

Factors			Frequency			%	
			MA	**CA**	**Total**	**MA**	**CA**
Social	**Gender**	females	321	1001	1322	24.28	75.72
		males	449	1008	1457	30.82	69.18
	Age	young	330	1153	1483	22.25	77.75
		middle-aged	273	632	905	30.17	69.83
		old	167	224	391	42.71	57.29
	Education	secondary or below	394	271	665	59.25	40.75
		university	337	1013	1350	24.96	75.04
		postgraduate	39	725	764	5.10	94.90
	Place of residence	villager	439	762	1201	36.55	63.45
		migrant	63	259	322	19.57	80.43
		urbanite	268	988	1256	21.34	78.66
Linguistic	**Style**	careful	64	252	316	20.25	79.75
		casual	706	1757	2463	28.66	71.34

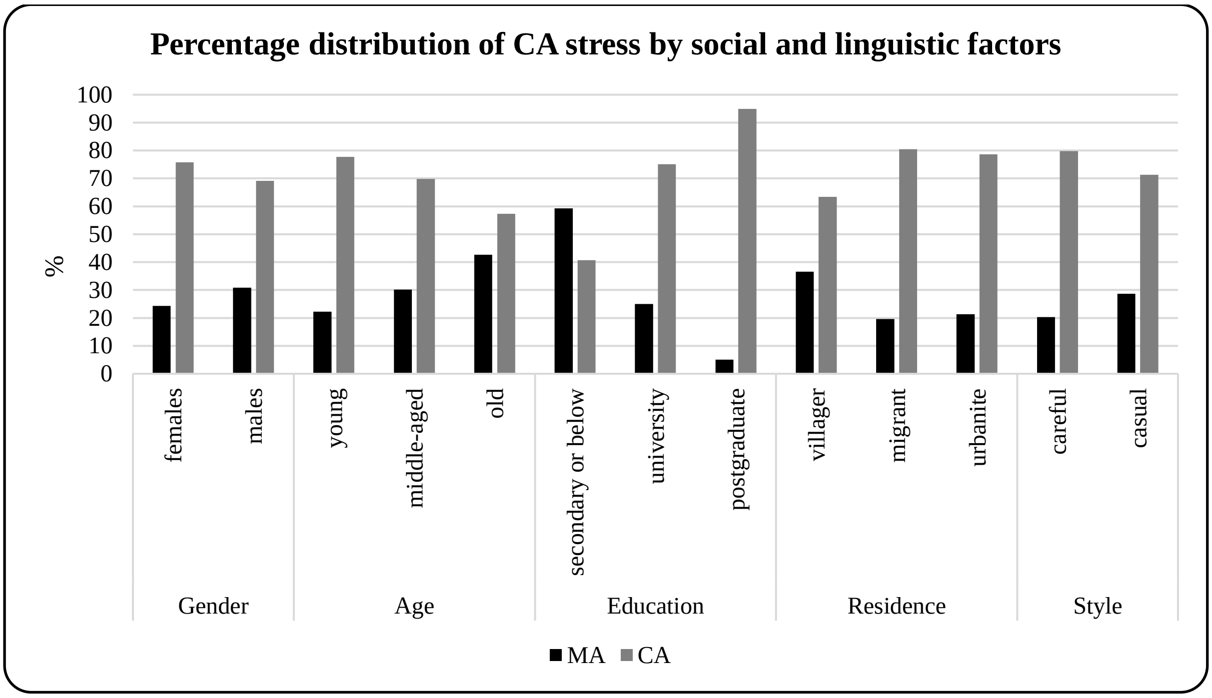


Figure 6.1: *Percentage distribution of CA stress by social and linguistic factors*

6.4.2 Interactions between social factors

Table 6.3 and Figure 6.2 show that there are important interactions among all the social factors of interest in causing convergence on CA stress in Minya: age interacted with gender, age with education, age with place of residence, gender with education, gender with place of residence, and education with place of residence. The hypothesis of the present study is that convergence on CA stress is led by young, highly-educated females born in town or living in town as rural migrants. This hypothesis means that all these significant interactions should ideally be included in a maximal model.

6.4.3 Protocol of statistical analysis and model selection

In the analysis of the (stress) dataset, mixed-effects maximal logistic regression analysis (see section 3.3.4) was carried out via the *glmer* function in the *lmer* package (Bate, Maechler, Bolker & Walker, 2015) in R (R Project for Statistical Computing, 2015). The regression analysis was designed so as to establish the contribution of social and linguistic factors to the

Table 6.3: *Interactions between the social factors of interest in convergence on CA stress*

Interactions			Frequency			%	
			MA	CA	Total	MA	CA
Age*gender	Young	female	149	694	843	17.67	82.33
		male	181	459	640	28.28	71.72
	Middle-aged	female	116	195	311	37.30	62.70
		male	157	437	594	26.43	73.57
	Old	female	56	112	168	33.33	66.67
		male	111	112	223	49.78	50.22
Age*education	Young	secondary or below	86	48	134	64.18	35.82
		university	238	647	885	26.89	73.11
		postgraduate	6	458	464	1.29	98.71
	Middle-aged	secondary or below	154	120	274	56.20	43.80
		university	86	338	424	20.28	79.72
		postgraduate	33	174	207	15.94	84.06
	Old	secondary or below	154	103	257	59.92	40.08
		university	13	28	41	31.71	68.29
		postgraduate	0	93	93	0	100
Age*residence	Young	villager	196	469	665	29.47	70.53
		migrant	23	102	125	18.40	81.60
		urbanite	111	582	693	16.02	83.98
	Middle-aged	villager	140	265	405	34.57	65.43
		migrant	40	157	197	20.30	79.70
		urbanite	93	210	303	30.69	69.31
	Old	villager	103	28	131	78.63	21.37
		urbanite	64	196	260	24.62	75.38
Gender*education	Female	secondary or below	165	191	356	46.35	53.65
		university	156	455	611	25.53	74.47
		postgraduate	0	355	355	0	100
	Male	secondary or below	229	80	309	74.11	25.89
		university	181	558	739	24.49	75.51
		postgraduate	39	370	409	9.54	90.46
Gender*residence	Female	villager	184	269	453	40.62	59.38
		migrant	0	44	44	0	100
		urbanite	137	688	825	16.61	83.39
	Male	villager	255	493	748	34.09	65.91
		migrant	63	215	278	22.66	77.34
		urbanite	131	300	431	30.39	69.61
Education*residence	Secondary or below	villager	164	31	195	84.10	15.90
		migrant	23	7	30	76.67	23.33
		urbanite	207	233	440	47.05	52.95
	University	villager	270	487	757	35.67	64.33
		migrant	8	108	116	6.90	93.10
		urbanite	59	418	477	12.37	87.63
	Postgraduate	villager	5	244	249	2.01	97.99
		migrant	32	144	176	18.18	81.82
		urbanite	2	337	339	0.59	99.41

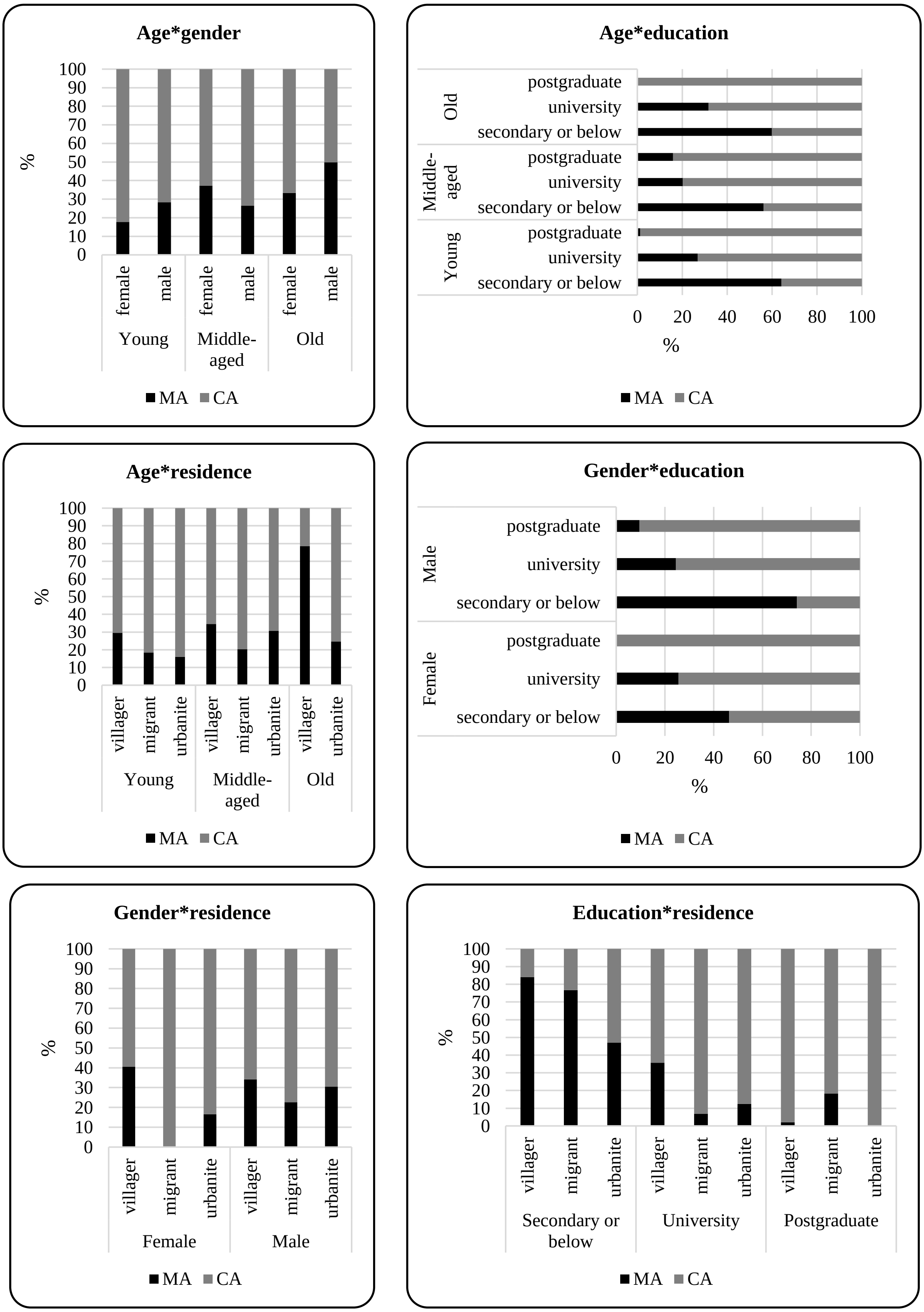


***Figure 6.2**: Interactions between the social factors of interest in convergence on CA stress*

probability of using CA stress. To carry this out properly, the following steps were followed in order: 1) structuring fixed and random effects, 2) designing the maximal model, and 3) selecting the best fit (model) to explain the variance in the data. These steps were adapted from Baayen (2008), Zuur, Ieno, Walker, Saveliev, & Smith (2009), Barr, Levy, Scheepers, & Tily (2013), and Winter (2014) as summed up in Al-Hashmi (2016).

6.4.3.1 Structure of fixed and random effects

The social fixed effects tested in the (stress) dataset are those of interest here: `age`, `gender`, `education` and `residence`. These contain the following levels:

- `gender`: `female` and `male` (with `female` as the default/reference level)
- `age` is an ordinal variable, meaning that it is presupposed that an old person was previously middle-aged and young before that; thus, `age` was re-levelled as `young` (the default level), `middle-aged` and `old`.
- `education` is also an ordinal variable and, therefore, was re-levelled as `secondary or below` (the default level), `university` and `postgraduate`.
- `residence` is another ordinal variable and, thus, was re-levelled as `villager` (the default level), `migrant` and `urbanite`.

The linguistic fixed effects include `style` with two levels: `careful` (default) and `casual`. The `sounds preceding` and `following` stress were disregarded in analysing the (stress) dataset as they were not expected to affect the response variable.

All the social factors are *between-speaker* and *within-item*; that is, they do not vary within the same speaker but vary within the same item. For example, no speaker can be a male and a female at the same time, while male and female speakers may use the same item. The same applies to the other social factors (`age`, `education` and `residence`). As for `style`, it is *within-speaker* and *within-item*; careful and casual styles can be used by villagers and urbanites at the same time and the same item can be used in the two styles.

The random effects in the (stress) dataset include `item` and `speaker`. A null model including only the intercept/constant was fitted in order to reveal the variance in the two random effects. The results of this null model in Table 6.4 show that the variance in the dataset is attributed to `speaker` more than `item`. The `item` intercept variance is 31.53 and the `speaker` intercept variance is 99.90. The total variance is 31.53 + 99.90 = 131.43. The variance partition coefficient (VPC) (Steele, 2008) for `item` is 31.53/131.43 = 0.2398 and for `speaker` is 99.90/131.43 = 0.7601, which indicates that about 24% of the variance in the response variable can be attributed to `item` and about 76% to `speaker`. These results show that both `item` and `speaker` have > 0 values, thereby confirming the necessity of including them as random effects in the maximal model.

Table 6.4*: Summary of the null model testing the variance in the random effects in the (stress) dataset*

Intercept	Variance	Total variance	VPC	Observations	Speakers	Items
item	31.53	131.43	24%	2779	62	999
speaker	99.90		76%			

6.4.3.2 Designing the maximal model

The maximal model designed for the (stress) dataset included:

- All the fixed effects of interest: `age`, `gender`, `education`, `residence` and `style`.
- All the possible interactions between the fixed effects as justified by the hypothesis explained above: `age:gender`, `age:education`, `age:residence`, `gender:education`, `gender:residence` and `education:residence`;

- All random effects, random intercepts and random slopes[37]: `(1 + style + | speaker)` and `(1 + age + gender + education + residence + style| item).`
- To simplify the models to deal with anticonservative and non-convergence issues, the number of iterations was increased to `2e5` through adding `(control=glmerControl(optCtrl=list(maxfun=2e5)).`

The model structure above led to the following maximal model;

```
Max.stress <- glmer (convergence ~ age + gender + education + residence +
age:gender + age:education + age:residence + gender:education +
gender:residence + education:residence + style + (1 + style | speaker) + (1
+ age + gender + education + residence + style| item), data=stress,
family='binomial', control =glmerControloptimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

The maximal model designed above was expected to converge/yield results smoothly, but this expectation proved wrong, as is shown below.

6.4.3.3 Selecting the best model to explain the variance in the data

The maximal model described in section 6.3.3.2 did not work; thus, many other candidate models had to be fitted. To obtain the best fit, the `dropterm` and `update` functions in the MASS package (Venables & Ripley, 2002) were used to reduce and update the models after removing the factor with the highest `Pr(Chi)`. Once the last reduced model (with only significant factor/s) was reached, the maximal model was compared to the reduced model via the `anova` function in the `car` package (Fox & Weisberg, 2011) to see which was a better fit. Another comparison was done via the `somers2` function in the `Hmisc` package (Harrell, Dupont, & et al., 2016) to make sure that the `anova` results were right.

---

[37] The structure of random slopes above is based on Baayen (2008), who recoomends that “predictors tied to subjects (age, sex, handedness, education level, etc.) may require by-item random slopes, and predictors related to items (frequency, length, number of neighbors, etc.) may require by-subject random slopes” (p. 290).

6.4.4 Statistical analysis

The maximal model `Max.stress` was fitted, but it did not converge. It was then simplified by fitting different models via decreasing the number of interactions one by one, while keeping all the random slopes, but in spite of these measures no model, i.e. from `Max.stress.1` to `Max.stress.6`, worked (see all models in Appendix 4). Model `Max.stress.6` was then re-fitted by removing the random slopes one after another until the model with two slopes, `(1+style|speaker)` and `(1+education|item)`, model `Max.stress.9`, with no interactions at all, worked. The interaction between age and gender (`age:gender`) was then added and the model worked. Another interaction was added (`education:residence`), and this model also worked. A third interaction (`age:education`) was added, but the model did not work. The third interaction was replaced by all the other interactions, but no model with more than two interactions and two random slopes yielded any results. The interactions between `age` and `gender` and `education` and `residence` were kept, as these are the most theoretically important ones as justified by the hypothesis. The last model, `Max.stress.11`, was considered the maximal model and its results are reported in Table 6.5.

```
Max.stress.11 <- glmer (convergence ~ age*gender + education*residence +
style + (1 + style + | speaker) + (1 + education + | item), data = stress,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

As is clear in Table 6.5, `education`, `residence` and `style` are the only significant factors that appear to be responsible for causing convergence on CA stress. `Age`, `gender` and the interactions between `age` and `gender` and between `education` and `residence` are all non-significant. As for `education`, there is a correlation between educational level and convergence on CA stress: the higher the speaker’s educational level, the greater the convergence. The default level secondary or below has the default estimate 0. Compared to this, the university and postgraduate levels have the respective positive estimates 6.8160 and 16.1903, thus showing that postgraduates lead convergence, followed by university students/graduates, and finally those with lower educational levels or who are completely non-educated at all. The p-values of university and postgraduate, 0.003216** and 4.15e-06*** respectively, also show that the differences between these groups and secondary or below are very significant.

Table 6.5*: Contribution of social and linguistic factors to the probability of MA speakers' convergence on CA stress in model Max.stress.11*

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-2.4097	2.4549	-0.982	0.326300	
agemiddle-aged	-2.0853	2.2002	-0.948	0.343255	
ageold	1.9343	3.8785	0.499	0.617969	
gendermale	-0.3872	1.5149	-0.256	0.798249	
educationuniversity	6.8160	2.3134	2.946	0.003216	**
educationpostgraduate	16.1903	3.5168	4.604	4.15e-06	***
residencemigrant	2.8957	4.2690	0.678	0.497573	
residenceurbanite	6.3845	2.5454	2.508	0.012133	*
stylecasual	-2.8563	0.7970	-3.584	0.000339	***
agemiddle-aged:gendermale	1.5786	2.7629	0.571	0.567761	
ageold:gendermale	-4.3892	4.2289	-1.038	0.299308	
educationuniversity:residencemigrant	3.3687	5.4520	0.618	0.536655	
educationpostgraduate:residencemigrant	-7.9740	5.2733	-1.512	0.130500	
educationuniversity:residenceurbanite	-1.6863	3.0829	-0.547	0.584377	
educationpostgraduate:residenceurbanite	-5.9344	4.0738	-1.457	0.145185	
Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**					

Similarly, there is another correlation between residence and convergence on CA stress: the more time a speaker has spent living in town, the more he/she has converged. Urbanites born and living in town lead the convergence, followed by rural migrants to town, and finally villagers. This is also clear from the respective positive estimates of the three levels of residence: villager, 0; migrant, 2.8957; and urbanite, 6.3845. While the difference between migrants and villagers is not significant, that between villagers and urbanites is significant, as confirmed by the p-value 0.012133*. Style also plays a role in convergence on CA stress. It is evident that paying attention to speech in the `careful` style predisposed speakers to converge more than in the `casual` style, in which speakers were involved in speaking in a more relaxed way about personal topics (e.g. childhood memories). As the `careful` style is the default, it has the estimate `0`. Compared to this, the `casual` style has the negative estimate `−2.8563`, and the difference between the two levels is significant, as established by the high p-value `0.000339***`.

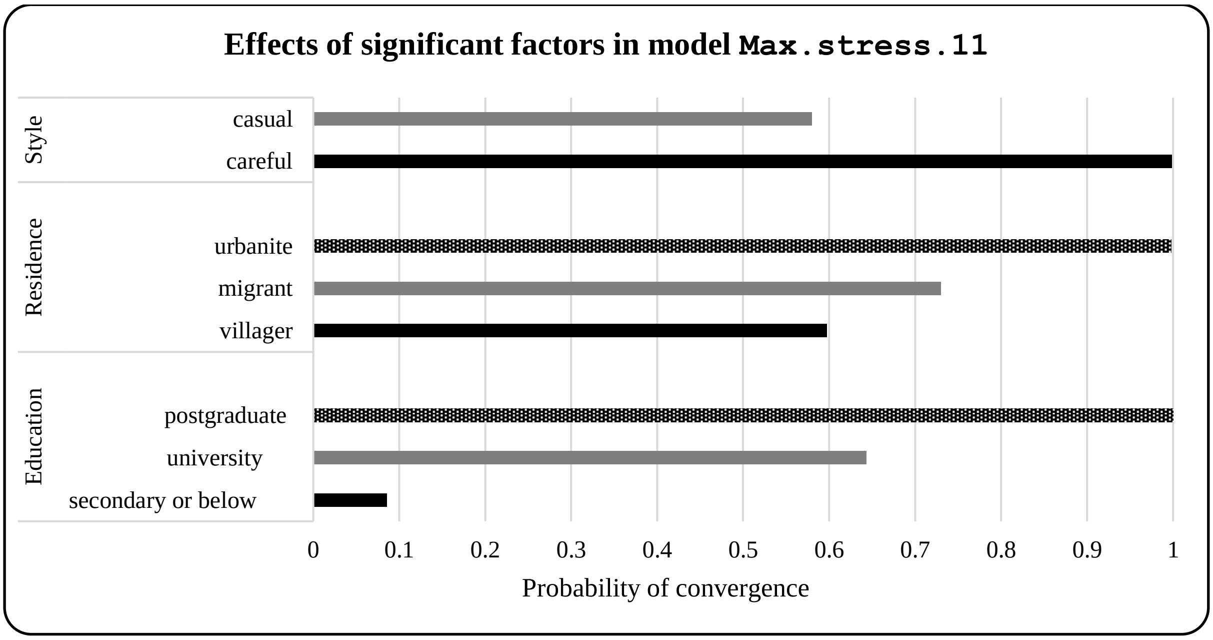


Figure 6.3*: Effects of significant factors in model* `Max.stress.11`

To obtain the best fit, the `dropterm` and `update` functions were used to reduce the maximal mode, `Max.stress.11`. The (stress) dataset required running the `dropterm` function 4 times and updating the model 4 times, from `Redu.stress.1` to `Redu.stress.4`. Appendix 4 lists the results of all the models fitted. The results of the last model `Redu.stress.4`, which tests the effects of `education + residence + style + (1 + style | speaker) + (1 + education | item)`, are reported in Table 6.6.

The results of the reduced model (`Redu.stress.4`) as reported in Table 6.6 are very similar to those of the maximal mode, `Max.stress.11`. The significant factors that remained in the reduced model are also `education`, `residence` and `style`. Even the estimates of the levels are similar and show the same correlations: the higher the educational level (`education`), the longer time a speaker has spent in town (`residence`), and the more attention paid to speech (`style`), the higher the convergence on CA stress.

Table 6.6*: Contribution of significant factors to the probability of MA speakers' convergence on CA stress in model* `Redu.stress.4`

	Estimate	Std. Error	z value	Pr(>|z|)	
(Intercept)	-2.7471	1.5805	-1.738	0.082196	.
educationuniversity	6.6984	1.5416	4.345	1.39e-05	***
educationpostgraduate	12.1388	2.7572	4.403	1.07e-05	***
residencemigrant	0.5003	1.9932	0.251	0.801820	
residenceurbanite	4.7570	1.3602	3.497	0.000470	***
stylecasual	-2.4861	0.7456	-3.334	0.000856	***
Signif. codes: 0 '*' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1**					

Models `Max.stress.11` and `Redu.stress.4` were compared via the `anova` function, and the results below show that the reduced model is better because of its smaller AIC and BIC.

```
> anova(Max.stress.1, Max.stress.5)
Data: stress
Models:
Redu.stress.4: convergence~ education + residence + style + (1+ style |speaker)
+ (1 + education | item)
Max.stress.11: convergence ~ age + gender + education + residence + age:gender
+ education:residence + style + (1 + style | speaker) + (1 + education | item)
              Df  AIC    BIC  logLik deviance   Chisq Chi Df Pr(>Chisq)
Redu.stress.4 15 1440.9 1530.1 -705.47   1410.9
Max.stress.11 24 1450.2 1592.8 -701.09   1402.2 8.7451     9     0.4611
```

The two models were then compared via the `somers2` function, and the results also confirm that the reduced model is a better fit because of its bigger C and Dxy values.

```
> probs = 1/(1+exp(-fitted(Max.stress.11)))
> somers2(probs, as.numeric(stress$convergence)-1)
          C          Dxy        n            Missing
   0.9559471    0.9418942   2779.0000000    0.0000000
> probs = 1/(1+exp(-fitted(Redu.stress.4)))
> somers2(probs, as.numeric(stress$convergence)-1)
          C          Dxy        n            Missing
   0.9857456    0.9714912   2779.0000000    0.0000000
```

6.5 Conclusion

In this chapter, the variation in word stress in MA has been shown. Results show that adopting CA stress correlates positively with education: the higher the speaker's educational level, the more likely CA stress is to be converged on. Place of residence also has a strong effect in terms of the adoption of CA stress or maintaining traditional MA stress: urbanites are far more likely to use CA stress than are villagers, with rural migrants falling in between these two groups. Paying attention to speech in the careful style triggers the use of CA stress significantly more strongly than relaxed speaking in the casual style. There are no significant differences between males and females or between young, middle-aged and old participants. No interaction between age and gender or between education and place of residence is significant in triggering convergence either.

Why are education, place of residence and style significant factors in motivating MA speakers to abandon MA stress? What are the associations that people have with CA stress and MA stress, according to the results and participants' opinions? All these questions will be addressed in Chapter 7.

Chapter Seven: Discussion & Conclusion

7.1 Introduction

Having presented variation in the linguistic variables under investigation in the Minya speech community, it is time to comment on this variation, and to compare and contrast the patterns in different variables. These things will be done in two ways: i) via the statistical results reported in Chapters 4, 5 and 6, and ii) through the results of the online perception questionnaire (see Appendix 5) that was answered by 61 participants, all born and living in Minya (see more details in section 3.2.2). The questionnaire was designed, answered and analysed via the Qualtrics Survey Platform. Furthermore, an attempt will be made to answer some of the unanswered research questions in Chapters 4, 5 and 6 regarding why there is convergence on CA in Minya and what associations speakers make with the variants of the variables explored in Minya. Hypotheses will be re-visited, and, finally, some of the limitations of the study are outlined.

7. 2 Summary of Results

Results for the five variables show that CA has diffused to Minya to a great extent, as is clear from the high percentages of convergence shown in Table 7.1. The variable converged on the most is (stress), followed by (KaLLiM), (q), (WaSSaL) and finally (XaLLiF). This shows that CA is being converged on in Minya at the segmental (consonants and vowels) and supra-segmental (stress) levels.

Table 7.1: *Distribution of the CA and MA variants of the variables investigated as used by all participants*

	Frequency			%	
Variable	**MA**	**CA**	**Total**	**MA**	**CA**
(q)	1466	2598	4064	36.07	63.93
(KaLLiM)	122	277	399	30.58	69.42
(XaLLiF)	72	71	143	50.35	49.65
(WaSSaL)	49	80	129	37.98	62.02
(stress)	764	2015	2779	27.49	72.51

Table 7.2: *Likelihood of abandoning the MA variants of the five variables investigated in the event of convergence on CA in Minya*

Variable	***likely***		***neutral***		***unlikely***		Total responses
	frequency	**%**	**frequency**	**%**	**frequency**	**%**	
(q)	46	75.41	12	19.67	3	4.92	61
(KaLLiM)	40	65.57	13	21.31	8	13.11	61
(XaLLiF)	35	57.38	12	19.67	14	22.95	61
(WaSSaL)	38	62.30	10	16.39	13	21.31	61
(stress)	41	67.21	14	22.95	6	9.84	61

In the online questionnaire, participants were asked how likely the MA variants of the five variables are to be abandoned in Minya if speakers converge on CA. The answers in Table 7.2 show that they think that the MA variant of (q) is the most likely to be abandoned, followed by the MA variants of (stress), (KaLLiM), (WaSSaL), and finally (XaLLiF). If (q) is excluded, these expectations, then, are exactly in the same order as the usage in the datasets. Figure 7.1 shows the CA variants of the five variables as observed in the datasets and as expected in the questionnaire results. The differences are slight except for (q): the expectations of using the CA variant [ʔ] is rather higher (73.02%) than its actual use (63.93%), indicating the high salience of this variable.

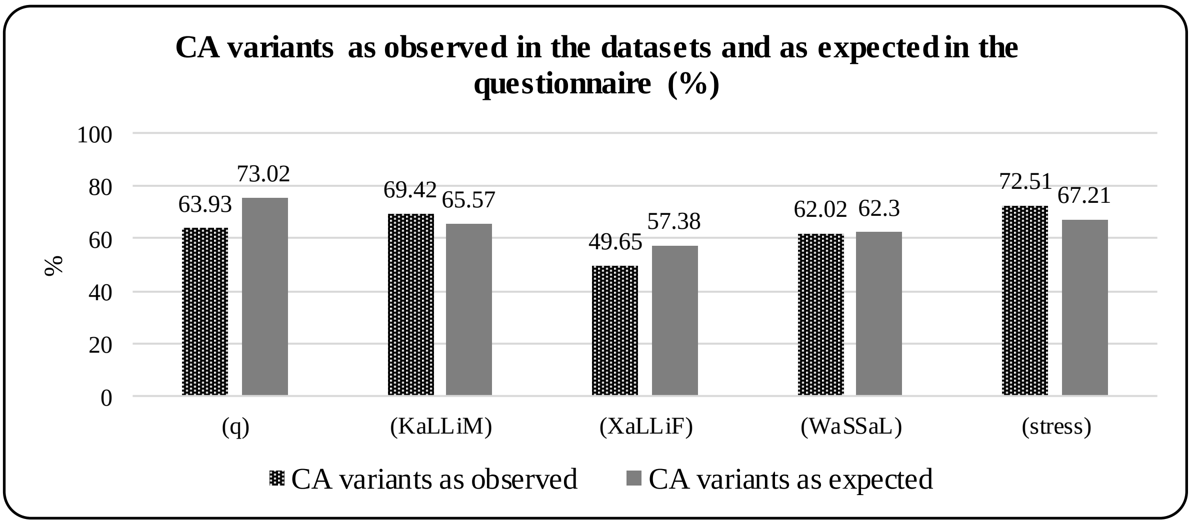


Figure 7.1: *CA variants as observed in the datasets and as expected in the questionnaire (%)*

In terms of the social factors and their impact on convergence on the CA variants of the five variables under study, `education` is the most significant in both the maximal and reduced models. Following `education` is `residence`, then `age` and finally `gender`. `Education` is significant in all models except the reduced model of the (WaSSaL) dataset. `Residence` is equally significant in the reduced models (i.e. significant in all models except in the (XaLLiF) dataset). `Age` is only significant in the (KaLLiM) and (WaSSaL) datasets in the maximal models, and only in the (WaSSaL) dataset in the reduced models. `Gender` is the least significant: it is always non-significant, except in the maximal model of the (WaSSaL) dataset. Neither the interaction between `age` and `gender` nor that between `education` and `residence` is significant in predicting convergence on CA either in the maximal or reduced models.

Table 7.3: *Summary of the significance levels of the social and linguistic factors in the maximal and reduced statistical models testing convergence on the CA variants of the five variables investigated*

Model	**Factor**		**(q)**	**(KaLLiM)**	**(XaLLiF)**	**(WaSSaL)**	**(stress)**
Maximal	Social	Age	NS	significant	NS	significant	NS
		Gender	NS	NS	NS	significant	NS
		Education	significant	significant	significant	significant	significant
		Residence	significant	NS	NS	NS	significant
		Age*gender	NS	NS	NS	NA	NS
		Education*residence	NS	NS	NA	NA	NS
	Linguistic	Style	significant	NS	NS	NS	significant
		Preceding_sound	significant	significant	NS	significant	NA
		Following_sound	significant	NS	NS	significant	NA
Reduced	Social	Age	NS	NS	NS	significant	NS
		Gender	NS	NS	NS	NS	NS
		Education	significant	significant	significant	NS	significant
		Residence	significant	significant	NS	significant	significant
	Linguistic	Style	significant	NS	NS	NS	significant
		Preceding_sound	significant	NS	NS	NS	NA
		Following_sound	significant	NS	NS	NS	NA

NS= non-significant, NA= not available

As regards the linguistic factors, the `preceding_sound` is the most significant in the maximal models, where this factor appears to trigger convergence on the CA variants of (q), (KaLLiM) and (WaSSaL). The `following_sound` also seems to trigger the use of the CA variants of (q) and (WaSSaL). In the reduced models, however, `style` is more significant in triggering convergence on CA [ʔ] and stress compared to the effect of the `preceding_sound` and `following_sound`, which are significant only in triggering convergence on [ʔ].

7.3 Anomalous Results

Looking closely at the results outlined above shows some anomalies, especially regarding convergence on CA stress and the CA variant of (q). (q) and (stress) are the two most salient variables, as judged by the participants who answered the questionnaire (see Figure 7.1). The two variables are also quite different: (q) is a very salient consonantal variable (Al-Wer & Herin, 2011), and it has been studied extensively in Arabic variationist studies (see section 4.4), whereas (stress) has hardly been studied in any Arabic study on language variation and change.

The criterion based on which the degree of salience was measured is the question included in the questionnaire: if an MA speaker converges on CA, how likely he/she will abandon the MA variant of (q) and MA stress? The answers to this question (see Tables 7.1 and 7.2) show that the MA variant of (q) and MA stress are respectively expected to be abandoned by 73.02% and 67.21%. This shows that [g], the MA variant of (q), is more salient than MA stress and that MA speakers are aware that the variant of (q) is a more distinctive feature than stress in their dialect. Being aware of this stigma is in harmony with Trudgill's first condition leading to a variable being salient (1986, p.11). In addition, the answers to the question about the associations with the CA and MA variants of (q) and (stress) in Minya (see Table 7.5) show that the CA variant of (q) is associated with young people, females, the educated and urbanness more than CA stress. On the other hand, the MA variant of (q) is associated with the old, males, non-educated and the countryside life more than MA stress. These associations represent the extra-linguistic (psychological and pragmatic) factors that Kerswill and Williams (2002) stipulate for a variable to be salient (see details in section 1.6). So, if (q) is more salient than (stress), why do MA speakers converge on CA stress more than on [ʔ], the CA variant of (q)? The answer to this question comes from Trudgill (1986) as well. He lists three conditions that may prevent or delay convergence: phonotactic constraints, homonymic clash and a too strong stereotype (p. 21).

There are no phonotactic constraints to prevent the CA variant [ʔ] from replacing the MA variant [g], or CA stress from replacing MA stress. There is no homonymic clash between CA and MA stress. However, there is a homonymic clash if the MA variant [g] is substituted with the CA variant [ʔ], as [ʔ] is a separate phoneme in MA. Examples of this clash include:

[ʔ] in CA	**[ʔ] in MA**	**[g] in MA**
[ˈʔɑmɑɾ] ‘*he ordered’* and *‘moon’*	[ˈʔɑmɑɾ] ‘*he ordered’*	[ˈgɑmɑɾ] ‘*moon’*
[ˈʔalam] ‘*pain’*, ‘*slap’* and ‘*pain’*	[ˈʔalam] ‘*pain’*	[ˈgalam] ‘*slap’* and ‘*pen’*
[ʔɪsm] ‘*name’* and ‘*department’*	[ʔɪsm] ‘*name’*	[gɪsm] ‘*department’*
[ˈʔɑʃʃɑɾ] ‘*he instructed’* and ‘*he peeled’*	[ˈʔɑʃʃɑɾ] ‘*he instructed’*	[ˈgɑʃʃɑɾ] ‘*he peeled’*
[ˈʔɑssɑr] ‘*he affected’* and ‘*he shortened’*	[ˈʔɑssɑr] ‘*he affected’*	[ˈgɑssɑr] ‘*he shortened’*
[ˈʔɑtˤɾɑ] ‘*softer’* and ‘*eye drops’*	[ˈʔɑtˤɾɑ] ‘*softer’*	[ˈgɑtˤɾɑ] ‘*eye drops’*
[ˈʔɪlla] ‘*except’* and ‘*handful’*	[ˈʔɪlla] ‘*except’*	[ˈgɪlla] ‘*handful’*
[ʔiːd] ‘*hand’* and ‘*set fire* imperative’	[ʔiːd] ‘*hand’*	[giːd] ‘*set fire* imperative’

This homonymic clash might delay convergence on CA. The third inhibiting factor, according to Trudgill (1986, pp. 18-19), occurs when a stereotype is too strong[38], and this applies to (q), which is more salient than (stress) in Minya. In this way, MA speakers who converge on CA [ʔ] may appear distancing themselves from their communities. This is very clear in the case of participants from the countryside, in which communities have dense social networks, there is a high sense of the local community, and the pressure to keep traditional variants as identity markers is very high. The image is made clear in Table 7.4, which shows that 12 participants

[38] Trudgill (1986) notices that Northerners in England are stereotyped by Southerners as pronouncing ‘*butter’* as [ˈbʊtə] and ‘*dance’* as [ˈdæns] and that when Northerners move to the south they converge on the Southern pronunciation of ‘*butter*’, i.e. [ˈbʌtə], but “would rather drop dead” than pronounce ‘*dance’* as [dɑːns] because “the stereotype that this is a Southern form is … too strong” (p. 18).

***Table 7.4**: Participants' use of the CA variants of (q) and (stress)*

speaker	(q) Total observations	(q) % CA	(stress) Total observations	(stress) % CA	speaker	(q) Total observations	(q) % CA	(stress) Total observations	(stress) % CA
PFMiV8-1	34	**5.88**	86	**100**	UFYUr10-7	67	**100**	50	**100**
PFOUr6-13	133	**100**	48	**100**	UFYUr2-2	90	**100**	46	**100**
PFYT5-1	91	**100**	46	**100**	UFYUr3-2	58	**100**	33	**100**
PFYUr6-11	67	**100**	56	**100**	UFYUr6-5	69	**100**	44	**100**
PFYUr6-4	98	**100**	50	**100**	UFYUr6-7	72	**100**	39	**94.87**
PFYUr6-6	83	**100**	35	**100**	UFYUr7-2	72	**6.94**	42	**33.33**
PFYUr9-2	79	**100**	43	**100**	UFYV10-2	41	**19.51**	32	**43.75**
PMMiT10-6	43	**0**	35	**5.71**	UFYV11-1	45	**37.78**	40	**65**
PMMiT7-1	57	**100**	50	**96**	UFYV2-3	40	**92.5**	42	**95.24**
PMMiV2-1	78	**100**	41	**97.56**	UFYV4-1	50	**100**	33	**100**
PMOUr6-9	64	**100**	48	**100**	UFYV8-2	55	**0**	35	**4.29**
PMYT1-3	79	**97.47**	51	**100**	UFYV9-3	83	**100**	52	**100**
PMYUr5-3	62	**96.77**	65	**96.92**	UFYV9-4	103	**0**	42	**7.14**
PMYV5-5	35	**40**	65	**93.85**	UFYV9-5	98	**100**	60	**6.67**
SFMiUr10-1	93	**0**	38	**0**	UMMiT7-3	72	**100**	69	**100**
SFMiUr6-1	42	**28.57**	48	**25**	UMMiUr6-8	81	**100**	49	**100**
SFMiUr6-2	31	**96.77**	47	**95.74**	UMMiUr9-1	106	**100**	57	**100**
SFMiUr7-4	53	**100**	70	**70**	UMMiV1-5	44	**9.09**	39	**0.77**
SFOUr7-10	78	**97.44**	68	**100**	UMMiV11-3	98	**2.04**	32	**18.75**
SFOV8-7	127	**0**	56	**0**	UMMiV5-4	41	**92.68**	50	**98**
SFYUr6-12	44	**59.09**	35	**54.29**	UMMiV8-3	84	**35.71**	56	**4.64**
SMMiV8-4	97	**1.03**	27	**25.93**	UMOT7-8	53	**45.28**	48	**3.33**
SMMiV8-6	43	**0**	49	**16.33**	UMOV11-2	37	**5.41**	41	**8.29**
SMOUr6-3	41	**2.44**	30	**40**	UMYUr10-4	57	**3.51**	38	**8.42**
SMOUr7-7	95	**60**	40	**30**	UMYUr6-10	78	**100**	37	**100**
SMOUr7-9	68	**98.53**	30	**40**	UMYV1-1	49	**97.96**	49	**100**
SMOV1-4	93	**0**	35	**0**	UMYV10-5	84	**100**	58	**100**
SMYT7-5	44	**13.64**	30	**23.33**	UMYV11-4	70	**64.29**	33	**8.79**
SMYUr7-6	48	**100**	40	**15**	UMYV3-1	35	**11.43**	49	**8.57**
SMYV8-5	31	**48.39**	29	**55.17**	UMYV5-2	31	**3.23**	30	**6.67**
UFMiV10-3	26	**7.69**	30	**20**	UMYV8-8	44	**59.09**	33	**90.91**

S= secondary or below, U= university, P= postgraduate; F= female, M=male; Y= young, Mi= middle-aged, O=old; V= villager, T= migrant, Ur= Urbanite (roughly 20% of the total) used CA stress much more than [ʔ], the variant of (q). Of these 12, only two participants are urbanites, and the others are either villagers (9) or rural migrants (1). Most of these participants (see the dark grey cells in Table 7.4) are highly-educated, which means that place of residence has a stronger effect than education since the first is related to the countryside in which the stereotype of CA [ʔ] is much stronger than that of CA stress. As for the participants who converge higher on CA [ʔ] and on CA stress (see the light grey cells in Table 7.4), most of them are living in town where the stereotypes of the two variants are rather equal.

These results mentioned above are similar to those found by Al-Wer (1991) regarding her female participants' divergence from using [ʔ], the non-local variant of (q), and their maintenance of their traditional variant [g], even though [ʔ] is "generally considered more 'proper' for women" (p. 81). Al-Wer (1991) also reports that the same participants varied in their use of the local and non-local variants of the other less salient variables (namely, (θ), (ð) and (dʒ)). She attributes this divergence from using the non-local variant [ʔ] (despite its prestige and being related to the dialect of the capital, Amman) to the high salience and too strong stereotype pertinent to the variant whose use "would be immediately noticed by members of the local community" (p. 84) and "jeopardizes the speaker's position" (p. 84) in it.

7.4 Why Education and Place of Residence?

As is shown above, education and place of residence are the two social factors which seem most responsible for convergence from MA on CA. Why? Before answering this question, it is worth mentioning that social class and social network were considered as potential social factors for inclusion in this study, but were ultimately rejected. This is because, in the researcher's view, education can be used as an umbrella factor for social class and social network; this is what Al-Wer calls a "proxy" factor (2002a, p. 42). It was mentioned earlier that Haeri studied linguistic variation in Cairo, focusing on (q) (1997) (see section 4.4.2) and palatalization of dental stops (/t/, /d/, /tˤ/, /dˤ/ and their geminates) (1994) (see section 3.2.3.1). She relied on a social class index composed of four indicators: (1) parents' occupation, (2) speaker's education, (3) speaker's neighbourhood, and (4) speaker's occupation. In Egypt, in particular, a person's occupation is still largely based on his/her educational level, and the neighbourhood he/she settles in is also related to his/her occupation; therefore: *education → occupation → neighbourhood*. In turn, this means that social class is mostly dependent on the educational level; that is, the higher a person's educational level, the higher his/her social class.

The level of education can also be used as a proxy measurement of the extent to which a speaker's social network is dense or loose. Commenting on Arabic speech communities in general, Al-Wer (2002a), puts forward the view that

> in Arabic-speaking communities, it is not level of education per se which correlates with linguistic usage, rather that *level of education is actually an indicator of the nature and extent of the speakers' social contacts*. It just so happens, that, in the Arab World, access to education, especially at the higher level, and often even beyond primary schooling, involves significant alterations to individuals' socialisation patterns. *It involves leaving one's home town, changes in familial links, expansion in social contacts, interaction with speakers of other dialects, exposure to different social values, shifting of one's loyalties and attachments to various social groups, changes in priorities and ambitions, etc.* (p. 42). [italics mine]

Put another way, post-basic education leads to major changes, the two most important of which are the change in place of residence and disruption to the close-knit social network. In Egypt, the change is profound if a speaker attends university, as it is a hub for mixing with colleagues from different linguistic as well as social backgrounds and usually involves commuting or changing the place of residence (e.g. from a small urban centre to a big one, or from the countryside to the major urban centre). The change can be bigger still if students, especially those originally from the countryside, find jobs in an urban centre when they finally settle as rural migrants. This loosens their social networks more and more.

Rural migration in Minya, in particular, is highly correlated with a high level of education; a case in point is the many doctors, engineers and university lecturers in Minya City, the majority of whom are rural migrants. In this study, there are 7 rural migrant participants, 4 of whom are postgraduates, 2 are university graduates and 1 with a secondary-school vocational qualification. This is in proportion with the educational levels of rural migrants in Minya in general.

The linguistic outcomes of this interconnection between education, change of place of residence and migration are considerable. Rural migrants are usually under pressure and attempt to converge on the salient linguistic features of the dialect spoken in the place they migrate to. If they find out that other settlers have already converged on other linguistic features, migrants may follow in their steps. What happens in Minya is that rural migrants to any urban centre in Minya Governorate usually find that the other dwellers in this urban centre converge on CA; thus, the rural migrants also converge on CA rather than the traditional dialect of the place they have migrated to.

The results of the present study regarding the role of education in convergence on the prestigious dialect are greatly in harmony with those in the literature. Examples include [ʔ] as the variant of (q) in Amman (Abdel-Jawad, 1981), Cairo (Haeri, 1997) and Bethlehem (Amara, Spolsky, & Tushyeh, 1999); [d] as the variant of (ðˤ) in Damascus (Jassem, 1987); [ɛː] as the variant of (ah) in Korba (Walters, 1991); and [uː] as the variant of (aw) in Rades (Jabeur, 1987). In these examples, all of the prestigious/non-local variants converged on are different from the (standard) Fuṣḥā variants; that is ([q], [ðˤ], [a] and [aw], respectively). This suggests that high educational levels motivate speakers in these speech communities, and many others in the Arab

World, to move from using the non-prestigious/local spoken variants to the prestigious/non-local variants, rather than to the Fuṣḥā variants.

7.5 Why Not Gender or Age?

In contrast to most studies on Western and Arab speech communities alike, gender and age in this study are either only marginally significant or are non-significant at all. Their effect on the process of convergence on CA is very small. It is suggested here that the reason for this is related to the function of CA use in Minya, rather than to the age or gender of speakers. For example, in a job interview, would MA speakers converge on CA or use MA? The participants in the questionnaire answered this question, and they had the chance to choose more than one option. Their answers (Figure 7.2) show that they would use CA more than MA in all the contexts given, whether the interview is held in Cairo, in Minya or somewhere else in Egypt. What is noteworthy here is their favouring of CA even if the interview is held in Minya. Some participants provided comments on this choice, most of which are centred around the idea that using CA would positively influence those interviewing the participant, and might secure them a better chance of getting the job, especially if the job duties include dealing with people (e.g. receptionist, secretary, tourist guide). One participant gave this revealing comment:

> When I am in the room [interviewing venue], I try to take care with my language. Even if the interview is in Minya, I try to speak in the Cairene dialect [CA]. I do this because I know that those who interview me expect me to use the Cairene dialect, not the Minyāwi [MA] dialect. So, if I use the Minyāwi dialect, they may laugh at me and they will give the job to someone else. I know, of course, that using a given dialect is not everything that I am judged by, but it is important to speak in a way that is respected by the majority of people. Alas, speaking in the Minyāwi dialect is not respected to a great extent by some people. By the way, I use the Minyāwi dialect after I leave the interview.

Because both males and females in Minya need jobs, both may use CA in interviews as a tool to get the job. Needless to say, job seekers are often young, but even after getting the job the linguistic market may drive them to keep converging on CA, especially if the job is far away from Minya or involves commuting on a daily or weekly basis from Minya to other governorates. In contrast, convergence on CA might decrease the further up the age scale one goes, or if the job is inside Minya, and especially if the job does not involve dealing with people from outside Minya (e.g. working as a teacher at a school in the countryside).

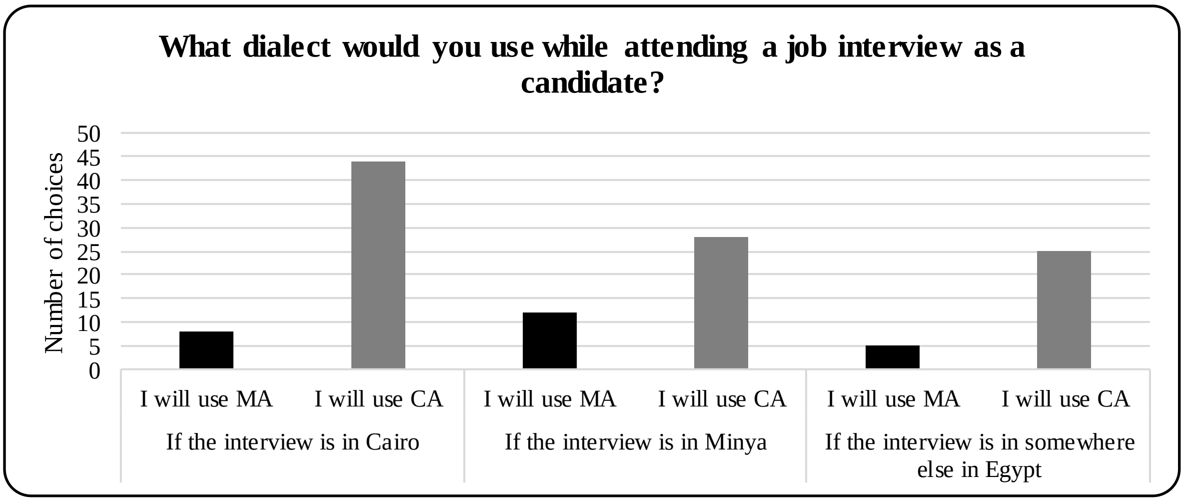


Figure 7. 2*: What dialect would you use while attending a job interview as a candidate?*

Similarly, convergence on CA in Minya may be triggered by style rather than the age or gender of speakers. When asked about which style might induce convergence on CA, participants in the questionnaire (see Figure 7.3) said that a formal style or monitored speech (e.g. speaking to a boss or strangers) would drive convergence much more than an informal style (e.g. speaking to friends). In this regard, the researcher asked one of the participants, who was a university student at Minia University when interviewed in 2012, about the occasions when he used CA. His answer was illuminating:

> I know that my Minyāwi dialect is not bad, but I find myself speaking the Cairene dialect with my lecturers, but not with cleaners or office boys who may see me as speaking like a girl if they hear me using the Cairene dialect. I also like to use the

Cairene dialect with female colleagues more than males, maybe to show them that I am not less refined than they are. It is bad to know that some girls [female students] look down on boys [male students] when the boys speak a dialect rather than the Cairene dialect.

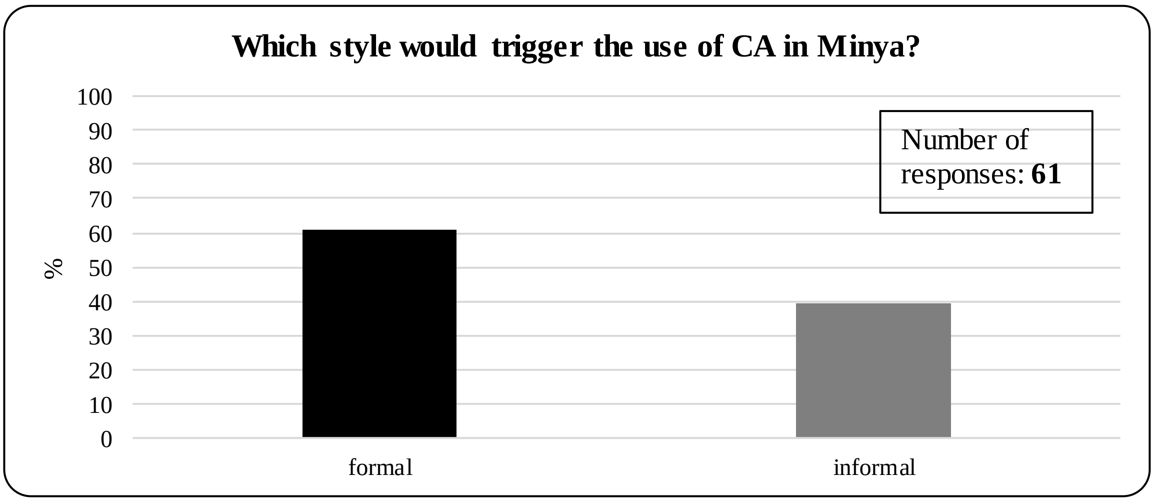


Figure 7.3*: Which style would trigger the use of CA in Minya?*

This answer is revealing as, from the researcher's personal experience, it also realistically reflects what is going on at most Egyptian universities, which may be the biggest hubs in Egypt for experimenting with and learning convergence on CA. The answer also shows how CA has different associations for different people: *it is highly-esteemed by university lecturers and female students and considered effeminate by office boys and cleaners.* From this answer, it can be concluded that CA may be used formally but not informally, and may be used by males with females, but not among males. The other side of the coin, as observed by the researcher, is that CA may also be used in Minya by females with males, but not among females. All of this suggests that MA speakers are conscious of the social significance of using CA and that they may capitalise on it to accomplish a given goal rather than use it for its prestige.

In all of these contexts, then, age and gender do not play a role *per se* in motivating MA speakers to converge on CA; rather, it is the situation/context that pushes them to do so. As mentioned above, this differs strikingly from the literature (see Labov's (1990) principles clarified in section 3.2.3.1), which is full of examples showing that females and the young use prestigious spoken features significantly more than males and the old, respectively. Examples include females' greater use of [ʔ] in Amman (Abdel-Jawad, 1981) and Damascus (Daher, 1999); females' use of the de-affricated variant [k] of the variable (k) vis-à-vis males' maintenance of the local affricate variant [t͡ʃ] in Qasim, Saudi Arabia (Al-Rojaie, 2013); the use of [ʒ], the prestigious Damascene variant of (dʒ), by the young much more than the old (Jassem, 1987); and young females' use of [ʔ], the variant of (q), more than old females in Salt, Ajloun and Karak (Al-Wer, 1991).

7.6 Associations with the Variables Investigated

The question of why MA speakers converge on CA cannot be separated from the two related questions: i) what are the associations with CA compared to those of MA as held by MA speakers? and ii) can these associations explain the findings of this study? The results summed up in Table 7.5 show that CA is associated the most with high education and town life. It is true that females use CA more than males and the young use it more than the old, but statistical analysis shows that the differences are hardly significant or are not significant at all. In the questionnaire, participants were also asked about the associations they had with the MA and CA variants of the five variables investigated. They could choose one association or more for each variant, of which audio examples were given. The results in Table 7.5 and those shown in Figure 7.4 corroborate the statistical results because they also show the clear difference between the associations with the CA and MA variants regarding education and place of residence. Participants look at the CA variants as more appropriate for the educated and town life, whereas the MA variants are more appropriate for the non-educated and the countryside life. Results also show that participants believe that the CA variants are more appropriate for females and the young, while the MA variants are more appropriate for males and the old. The

Table 7.5: *Associations with the CA and MA variants of the five variables investigated in Minya by the number of participants' choices*

Social factor	Associations	Dialect	(q)	(*KaLLim*)	(*XaLLiF*)	(*WaSSaL*)	(stress)	Average
Age	appropriate for the young	CA	18	13	14	15	17	15.4
		MA	2	5	4	7	8	5.2
	appropriate for the old	CA	3	8	11	13	8	8.6
		MA	21	19	22	23	21	21.2
Gender	appropriate for females	CA	33	25	24	21	22	25
		MA	3	11	12	9	9	8.8
	appropriate for males	CA	6	12	16	16	8	11.6
		MA	30	23	20	22	22	23.4
Education	appropriate for the educated	CA	22	35	29	30	31	29.4
		MA	8	9	11	17	14	11.8
	appropriate for the non-educated	CA	4	6	13	9	5	7.4
		MA	28	29	28	30	28	28.6
Place of residence	appropriate for town	CA	49	44	38	43	44	43.6
		MA	6	10	12	15	12	11
	appropriate for the countryside	CA	4	12	20	16	12	12.8
		MA	45	46	43	38	43	43

differences regarding gender and age, however, are not as large as they are in the case of education and place of residence. This highlights that the statistical results echo MA speakers' views. Accordingly, it can be said that in Minya the associations related to the CA variants of the five variables in the study (and potentially also CA in general) include education and urban life while those related to the MA variants (and probably MA in general) include the opposite: low levels of education or illiteracy and non-urban life.

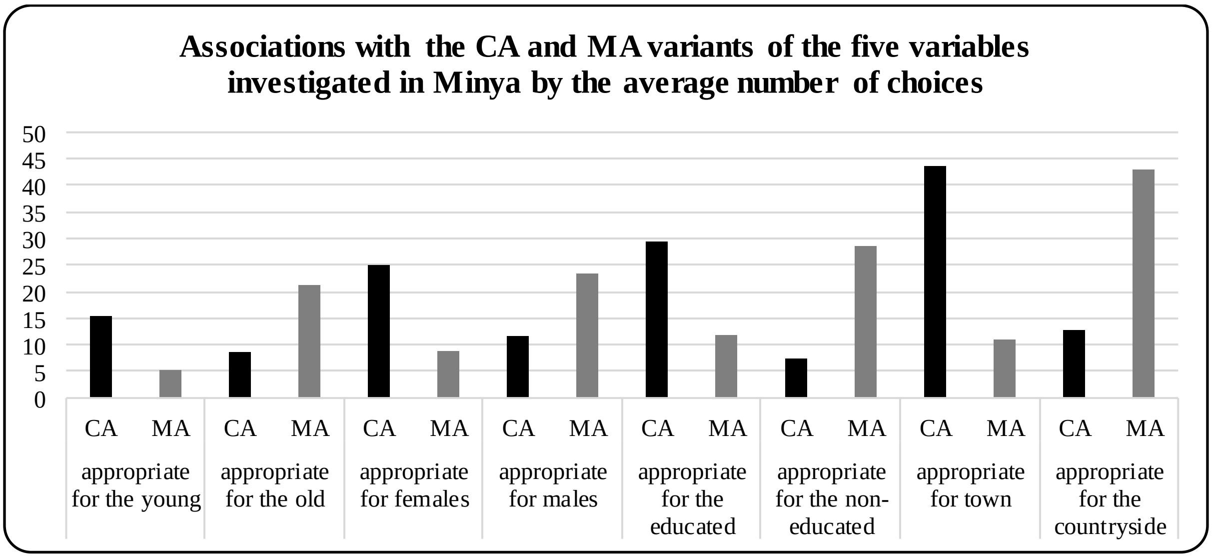


Figure 7.4: *Associations with the CA and MA variants of the five variables investigated in Minya by the average number of choices*

7.7 Awareness of Convergence on CA

When interviewing the participants, they were encouraged to feel at ease, and everything possible was done to motivate them to speak spontaneously (see details in section 3.2.1.2). Nevertheless, the linguistic insecurity of many participants was clear in two ways: their repetition of the same item in its MA and CA variants and overt statements that they were being affected by CA. Regarding repetition, this is particularly clear in the realisation of the variant of (q) in the vicinity of the variant of (dʒ). The CA and MA variants of these variables are as follows:

Variable	CA variants	MA variants
(q)	[ʔ]	[g]
(dʒ)	[g]	[dʒ]

Here, [g] has a double function: as the CA/prestigious variant of (dʒ) and as the non- prestigious variant of (q). When the variants of (q) and (dʒ) occurred close to each other, many participants used the MA variant of (q) (i.e. [g]) after an item which they realised using the CA variant of (dʒ) (i.e. [g]), before repeating the same item again but using the CA variant [ʔ]. Examples of this repetition are given in Table 7.6, and they suggest that converging on CA in this way is a change above the level of awareness (Labov, 1972). In addition, some participants made it clear that they were aware of their convergence on CA. For instance, in the middle of the interview with Participant UMOV11-2 (a villager, university graduate, male, 60 years, old, married and

Table 7.6: *Examples of realising the same item with the MA variant [g] and repeating it with the CA variant [ʔ]*

Mentioned				**Gloss**
	First time	**Repeated**		
gajˈjiːn	tɪsɾɪˈguːni	tɪsɾaˈʔuːni	ˈhɪna	Are you (pl.) coming to rob me here?
CA	MA	CA		
kaːn	bɪ-ˈjiːgi	ˈbaga	ˈbaʔa	he used to come
	CA	MA	CA	
naˈgaħt	bɪ-tagˈdiːɾ	bɪ-taʔˈdiːɾ	ˈgajjɪd	I succeeded with the grade of Good.
CA	MA	CA	CA	
ˈħaːga	gabl	ʔabl	ˈħaːga	something before something
CA	MA	CA	CA	

relatively mobile), when speaking about his life as a student at Cairo University, produced the following:

ˈlamma ˈkuntɪ ˈtˁɑːlib fiː ˈsana ˈʔuːla kʊlˈlɪjjɪt□lʔɪʕˈlaːm fiː ˈ**dʒ**amʕɪt□lˈqɑːhɪrɑ ♥♥

When I was a student in year one at the Faculty of Mass Communication at Cairo University,

wɪ-kan ˈħaddɪ jɪsˈʔalni ˈʔɪntam□ˈneɪn wɪ-ˈkʊntɪ ʔaˈ**g**ʊllʊ ♥ mɪ-lˈmɪnja kan jɪˈ**ʔ**uːl ◄

if someone asked me “where are you from?” and I said “from Minya.” he would say

ˈfeːnɪ□lˈmɪnja diː ʕal-xɑˈɾiːtˁɑ fɪ-l-ˈwa**g**tɪ ♥ da ma-ˈkanʃɪ ˈħadd fɪ-lˈqɑːhiɾɑ ♥ ˈjɪsmaʕ

“where is this Minya on the map?” At that time, nobody in Cairo had heard

ˈʕanɪ□lˈmɪnja ɣeːɾ dɪ-l-ˈwa**ʔ**ti ◄ ˈxɑːlɪsˁ maʕaˈlɪhʃɪ ja ˈdʊktʊɾ sʊˈʕuːdi ʔaħˈjaːnan

about Minya, contrary to now totally. <u>Excuse me</u>, Dr Saudi [the researcher]. <u>Sometimes,</u>

ˈb-a**g**lɪb ♥ʃɪˈwajja mɪnˈjaːwi wɪ-ʃˈwajja ˈlah**g**ɪt ◄ ʔɪlqɑːˈhɪɾɑ ◄

I switch, MA for some time and CA for some time.

◄ CA
♥ MA

This quote is extracted from the first five minutes in the interview conducted with the participant. As is made clear in section 3.2.1.2, the first five minutes, dedicated to collecting personal information from each participant, was disregarded from analysis and was considered an ice-breaker. Switching between CA and MA is clarified in the quote above, and the last part includes an overt ‘apology’ for switching, probably because the participant expected the researcher/interviewer to observe him using CA all the time, which did not happen. There are many other examples in the interviews, all of which speak of the participants’ awareness and deliberate convergence on CA.

In contrast to this insecurity, Cairenes who work or study in Minya never converge on MA. The researcher has seen and dealt with many Cairenes in Minya, some of whom have worked in Minya for more than 15 years, and convergence on MA was never observed, except when one or more Cairenes were trying to make fun of an MA speaker or lexical item (e.g. MA

[ʔɑˈɾuːsˤ] '*aubergine*' rather than the supralocal word [bɪdɪnˈgaːn]). In particular, the researcher asked two Cairenes, who had studied in Minya for four years and then worked there for ten years, why they never used MA. Their answers were along the following lines: "And why should I do this, while many people in Minya use CA with me?". Considering the fact that the number of Cairenes living, working and/or studying in Minya is tiny, interpersonal accommodation is not currently expected to have a big effect on the variation in MA, as is further detailed below.

7.8 The Direction of Variation/Change in MA

The results of all the variables investigated in the present study show that CA has diffused to Minya and has brought about linguistic variation in MA. Why has this happened? Is it interpersonal accommodation as a result of contact with Cairenes, face to face in Minya, or via some other means? Or is it a result of weak identity in Minya?

Auer and Hinskens (2005) maintain that interpersonal accommodation and linguistic change at the community level rarely co-occur. They proposed that linguistic change through accommodation can be actuated over three stages[39] (pp. 335-336), as follows:

Lowest level (interactional episode): short-term accommodation
⇩
Middle level (the individual): long-term accommodation
⇩
Highest level (speech community): language change

Figure 7.5*: The change-by-accommodation model as proposed by Auer and Hinskens (2005, p. 336)*

1) Short-term accommodation involves interpersonal accommodation between speakers with

[39] This model is also found in Trudgill (1986), who argues that, in face-to-face contact, "speakers accommodate to each other linguistically by reducing the dissimilarities between their speech patterns and adopting features from each other's speech" (p. 39). Trudgill (1986) also entertains the viewpoint that "if a speaker accommodates frequently enough to a particular accent or dialect, … then the accommodation may in time become permanent, particularly if attitudinal factors are favourable (p. 39) … and on a sufficiently large scale for considerable numbers of speakers to be involved (p. 42)".

different speech habits, innovative and traditional, with speakers of traditional habits accommodating to those with innovative ones. This can happen via face-to-face contact or any other means (e.g. telephone and virtual communities such as Facebook, Skype and WhatsApp). Thus, accommodation leads to the expansion of geographical as well as social diffusion of the innovative features.

2) Long-term accommodation starts when the innovative speakers are not there anymore, and speakers with traditional habits start to adopt the innovative features themselves, and these features then become their linguistic habits. The rate of using the innovative forms increases if the interaction is maintained with other speakers who adopt the innovative features.

3) Language change starts when linguistic innovations spread at the community level at large and finally lead to language change. This process is quickened if the innovators adopting the innovative features are part of the same multiplex, dense social networks.

Having considered the results of many studies, Auer and Hinskens (2005) reached the conclusion that participants involved in contact/interaction may accommodate to each other's behaviour and that the frequency of being exposed to a new diffusing feature may lead to the adoption of this feature. Nevertheless, they did not find strong evidence that interpersonal accommodation prefigures change at the community level. Rather, they referred to another model, the identity projection model, which has its roots in social psychology (Coupland, 1984; Giles, Coupland, & Coupland, 1991; Giles and Ogay, 2006), as the best model to explain change at the individual and community levels. Within this model, speakers do not only accommodate to the people they are in direct contact with (interlocutors), but also to the images or linguistic stereotypes of the group they want to belong to or to resemble, or to attractive speakers who do not have to be physically present (Auer and Hinskens, 2005, p. 356). Kerswill (2002a) maintains that applying the identity projection model to accommodation may "help us understand the spread of dialect features by geographical diffusion where face-to-face contact with users of the diffusing features is rare, if it is present at all" (p. 681).

The driving force in the variation operating in MA could be attributed to both interpersonal accommodation and identity projection. The number of Cairenes working or studying in Minya is very limited, but this does not exclude the possible influence of the following two facts. First of all, Cairenes working in Minya usually have senior positions and executive jobs (e.g. judges, university lecturers, army officers, police officers, businessmen, company and bank managers), which may have led people in Minya to associate CA with urbanness and education (see section 7.3) and possibly also to control or domination. In addition, some of these Cairenes commute to Minya every day from Cairo, while others may stay in Minya for two or three days a week at most, leaving their families back in Cairo, which also means that they are constantly in contact with their fellow Cairenes. Minyāwis working with Cairenes generally have inferior positions; therefore, they are expected to converge linguistically on Cairenes, and the opposite does not happen. This is another instance of linguistic insecurity (see section 7.7.2). It is worth mentioning here that Minyāwis are unlikely to feel linguistically insecure with non-Cairenes living, studying or working in Minya, especially those coming from governorates to the south of Minya. This may be owing to the fact that Minyāwis are more similar in dialectal and cultural norms to Upper Egyptians.

However socially superior the Cairenes working in Minya are, it is questionable whether interpersonal contact with them induces the current high level of convergence from MA on CA independently of other factors. The number of Cairenes working in Minya is so limited that it cannot plausibly lead to the high levels of convergence on CA reported in the results here and, indeed, there are hardly any Cairenes working in Minya Governorate outside Minya City, the capital of the governorate. Instead, it is argued here that it is identity projection that mostly drives convergence on CA in Minya. Based on the researcher's observations as a native speaker of MA, most MA speakers converge on CA with no Cairene physically present.

So, why do some - or rather most - MA speakers converge on CA? The same question was included in the online questionnaire and some of the frequent answers provided are as follows:

1) "CA is the dialect of high-status people (e.g. actors, politicians)";
2) "CA is suitable for use with everyone in Egypt, especially in big cities, and using it with strangers is better than using regional dialects";
3) "using CA improves my social image in front of others";
4) "I use CA so that no one mocks me";
5) "I prefer to use CA with females so that they do not look down on me";
6) "CA is a good dialect and, therefore, it is used in the media everywhere in Egypt";
7) "I use CA because it makes me feel like someone who belongs to the capital with its modernity and civilisation".

All these answers, and other answers to the questionnaire, point to a stereotype/model conjured up in the minds of the participants who are representative of MA speakers in general. The stereotype is of the urban, civilised Cairene whose accent is comprehensible and used in the media, as opposed to the stereotype of the mocked Minyāwi whose accent does not hold prestige equal to that of CA. Answers 6 and 7 above are important. Answer 6 refers to the role of the media in promoting the CA stereotype (see section 8.3) and Answer 7 refers to the sense of belonging to Cairo "with its modernity and civilisation".

It should be made clear here that Minya is part of what is generally called Aṣ-Ṣaʻīd Al-Barrāni (External Upper Egypt), which includes the area from the south of Giza to the south of Minya, versus Aṣ-Ṣaʻīd Al-Juwwāni (Deep Upper Egypt), which stretches from the north of Asyut as far as Aswan (see Map 1.1), and there is a lot of discussion regarding whether or not the area from Giza to Minya should be considered part of "real Ṣaʻīd" (Miller, 2007). The location of Minya in the middle of Egypt, nearly midway in terms of longitude and latitude of populated Egypt on the Nile Valley, may have made its people belong to the 'middle', being neither completely Upper Egyptians (Southerners) nor Lower Egyptians (Northerners). Egyptians living south of Minya to Aswan often look at Minya and Beni Suef as part of Lower Egypt, while Egyptians in the Delta north of Cairo often look at the two regions as part of Upper Egypt. This state of being in the middle is also mirrored in identity. In the interviews conducted in 2012, some participants clarified this dichotomy in identity when they were asked whether they had a strong engagement with TV serials set in Upper Egypt, and, if so, why. The majority of them made it clear that they had a very strong engagement with the few TV serials dealing with people's lives in Upper Egypt, especially *Zi'āb Al-Jabal* '*Mountain Wolves'* and *Aḍ-Ḍaw' Ash-Shārid* '*The Lost Light'* set in Qena, and *Ar-Raḥāya* '*The Millstone'* set in Sohag, and they were eager to know how Upper Egyptians in these regions live. When asked whether they had a sense of being Upper Egyptian, most of them said they had the sense of being so, but not in the same way as Upper Egyptians south of Minya. One participant expressed this as follows: "I feel I am an Upper Egyptian but in a way different from those *pure* Upper Egyptians south of Minya, especially in Sohag and Qena." It is believed here that this lack of feeling of being a *pure* Upper Egyptian in addition to the positive associations with CA in Minya (see section 7.3) all pave the way for Minyāwis emulating the CA stereotype, and this may trigger convergence on CA to a great extent.

7.9 Hypotheses Revisited

Having summed up the findings, it is time now to re-visit the hypotheses clarified in section 1.7. The hypothesis about gender (that females lead convergence on CA) has not proven right. It is true that females use CA more than males, but the differences are not significant at all. The hypothesis about age (the younger the speaker is, the more he/she converges on CA) is not completely true. Age is mostly non-significant even though young speakers tend to converge on CA more than old speakers. This, then, shows two things: 1) that there is no change in progress in Minya at the moment, and 2) if MA speakers continue converging on CA, which is expected in light of the current situation, a change may occur in the not too distant future. The hypothesis about education and its positive correlation with convergence on CA is true; the findings show that the higher the speaker's educational level, the more he/she converges on CA. As for place of residence, the hypothesis has also proven true; it is clear from the results outlined above that MA speakers' convergence on CA positively correlates with the time that they have spent living in town (i.e. the longer the time, the higher the convergence). This, quite obviously, means that urbanites lead convergence on CA, followed by rural migrants, and finally by villagers.

The hypothesis concerning style has somewhat proven true: MA speakers converge on CA, especially the CA variant [ʔ] and CA stress, in the careful style (the picture questionnaire in the data on which this study is based) more than in the casual style (open discussions). The careful style here also includes careful speech in formal situations (see details in section 7.5). Neither the sounds preceding nor those following the target variants of the five variables investigated were hypothesised to have any effect on MA speakers' convergence on CA. This has not completely proven wrong since the sounds preceding and following the variants of (q) significantly trigger the use of the CA variant [ʔ].

7.10 Limitations of the Study

Although every effort possible was exerted to conduct the current study in the most flawless way possible, it has some limitations that should be made clear here. First of all, the speaker sample used in the study, as is detailed in ection 3.2.4, has unbalanced numbers across the three educational levels: 14 postgraduates, 32 university students/graduates, and 16 at the secondary or below level, including the non-educated participants. This proportion is not representative of educational levels in Minya Governorate, but it is the consequence of the fact that many would-be old participants belonging to the third educational level declined to be interviewed.

Furthermore, the researcher tried to investigate all the salient variables in MA, and the first plan of the study was to cover the following variables: (q), (dʒ), (KaLLiM), (XaLLiF), (WaSSaL) and (stress). All of these variables were fully investigated, except for (dʒ) because of reasons beyond the researcher's control, although the (dʒ) was fully transcribed and coded. The researcher hopes he will explore this variable in detail in future studies.

While the numbers of observations in the (q) and (stress) datasets are sufficiently large, at 4064 and 2779 respectively, the number of observations of the vocalic variables (KaLLiM, XaLLiF and WaSSaL) are not so. Hence, the researcher did his utmost to analyse these datasets in particular in the best statistical way possible. The researcher also hopes that he or another researcher will re-visit the same vocalic variables by collecting more data so that the number of observations is big enough to yield accurate results, although this is not expected to lead to different results.

7.11 Conclusion

In this concluding chapter, a summary of the results of the five variables investigated, (q), (KaLLiM), (XaLLiF), (WaSSaL) and (stress), was presented by showing the distribution of the CA and MA variants and the results obtained via statistical analysis. It was shown that CA has diffused to Minya and has affected the linguistic behaviour of many MA speakers who generally converge highly on CA, especially if they are highly-educated and living in urban centres, whether born or rural migrants there, and generally in careful styles. It was also shown that gender and age are not generally significant factors in triggering convergence; rather, MA speakers do not converge on CA because they are males or females or because they are young, middle-aged or old. They converge depending on the context and the type of social networks they have, which are dependent on the level of education they have obtained. Education has been shown to be largely responsible for spatial as well social mobility and loosening social networks, which are all significant in inducing convergence on CA in Minya.

Based on the results of the online perception questionnaire, it has been shown that CA is associated with education and urbanness, which is supported by the results obtained via statistical analysis, and that it is converged on, not only as a dialect of prestige, but as a tool to achieve a goal (e.g. to be used in an interview and speaking to strangers).

While it is true that education and place of residence are the significant social factors mostly responsible for inducing convergence on CA in Minya, this would not occur unless there was a psychological factor at play, and this has been argued here to be identity projection. Interpersonal contact between MA and CA speakers may overlap with identity projection, but this contact is unlikely by itself to induce the rather high convergence on CA in Minya. Identity projection in this context refers to the psychological motivations among MA speakers to emulate the CA stereotype associated with education, urbanness and domination. This is also enhanced by the geographical position of Minya and MA speakers' attitudes. Minya is located in the middle of Egypt and MA speakers have a sense of being Upper Egyptians, but in a way rather different from the rest of Upper Egyptians south of Minya, and this makes MA speakers inclined to converge on CA probably more than other Upper Egyptians. This is evident in MA speakers' awareness of convergence on CA, as is clarified with examples above. Overall, the current *variation* in MA cannot be described as *change in progress* since age is mostly a non-significant factor. However, there are some indications that there might be a change in the not too distant future.

Chapter Eight: Directions for Future Studies

8.1 Introduction

In the present study, four social factors (i.e. age, gender, education, and place of residence) were hypothesised to be the ones principally responsible for convergence on CA in Minya. The results outlined in Chapter 7 show that education and place of residence are mostly responsible for this convergence. But is this the full picture? Are these the only factors responsible for convergence on CA in Minya? This is definitely not the full picture; there must be other factors playing a role, even if to a lesser degree, in inducing convergence. In particular, based on the researcher's observations and data comprising the present study (recorded interviews and the online perception questionnaire), marital status, religion and the amount of exposure to CA via the media are potentially important factors in triggering MA speakers' convergence on CA. In this Chapter, there is an attempt to shed light on the contribution of these three factors to the convergence on CA going on in Minya, along with recommendations for future studies in this regard.

8.2 Marital Status

If the social network is "a boundless web of ties that reaches out through a whole society, linking people to one another" (Milroy & Milroy, 1992, p. 5), marital status must be part of it. Marital status involves a web of ties that affects behaviour, including linguistic behaviour because marriage is one of the factors responsible for the intensity and quantity of contacts. Needless to say, this intensity and quantity differ from one society to another, as per their inherited social norms. For instance, marriage or any similar relationship in Western societies often loosens partners' social networks, since partners usually exchange their circles of relatives, acquaintances and friends. In contrast, in some conservative societies across the Arab World (e.g. Upper Egypt, the Gulf), the circles are not generally shared among the partners, owing to many factors, including social pressure, conservatism or religious adherence.

With the passage of time, partners in these societies get preoccupied with their partners and then children, thereby leading their social networks to be dense. Divorce also has long-term consequences of varying severity on former spouses' network structure and on their social participation (Milardo, 1987, p. 79). In Egypt, for instance, the stereotype is that ex-wives, in particular, are objects of derision and scorn, which for the most part pushes them to adopt a secluded life with very dense ties. For ex-husbands, it is quite the reverse, as they enjoy more freedom to start new relationships.

The linguistic outcomes of all types of marital status are far-reaching; nonetheless, these effects are still understudied. Mixed-language and cross-dialectal marriages or any similar relationships, for example, may involve codeswitching, dialect accommodation, style-shifting, lexical as well as phonological variation, etc., not only for partners but also for their families and friends. These outcomes certainly vary from one society to another, depending on the norms and expectations of each society. While some societies expect and even require wives to acquire their husbands' dialects, other societies require them to maintain their mother tongues/dialects (Stanford & Pan, 2013). For instance, in cross-dialectal marriages between the speakers of White Hmong and Green Hmong as used in the US, wives are expected to acquire the dialect of the husband's family (Keown-Bomar, 2004, as cited in Stanford & Pan, 2013). A reverse example can be found in Guizhou Province, China, where the indigenous Sui people have many clan-level dialects. In this speech community, endogamy is not allowed: husbands and wives cannot be members of the same clan. After women get married, they move permanently to their husbands' villages and largely maintain their original clan dialect features including lexical tone, even after decades of staying in their husbands' villages, since they would be ridiculed if they use their husbands' dialects (Stanford, 2008). In doing so, they "express a strong sense of stable, lifelong loyalty to their communities of descent despite being separated from their home villages" (Stanford, 2013, p. 26).

In the current study, marital status was not considered in statistical analysis; nevertheless, it is expected to be significant in triggering convergence on CA in Minya. An example of this can be given from the (q) dataset, as shown in Table 8.1 which sums up the results by marital status. It is clear that the widow(er)s in the sample use MA nearly all of the time. Since only two participants (SFOV8-7 and SMOUr6-3) are widow(er)s, these will be set aside and focus can be directed to the differences between singles and married people, and the difference between them (see Figure 8.1) points to a potentially significant result if tested statistically.

Table 8.1: *CA and MA variants of (q) by marital status*

Marital status	Frequency			%	
	MA	CA	Total	MA	CA
single	516	1504	2020	25.54	74.45
married	783	1093	1876	41.73	58.26
widow(er)	167	1	168	99.40	0.59

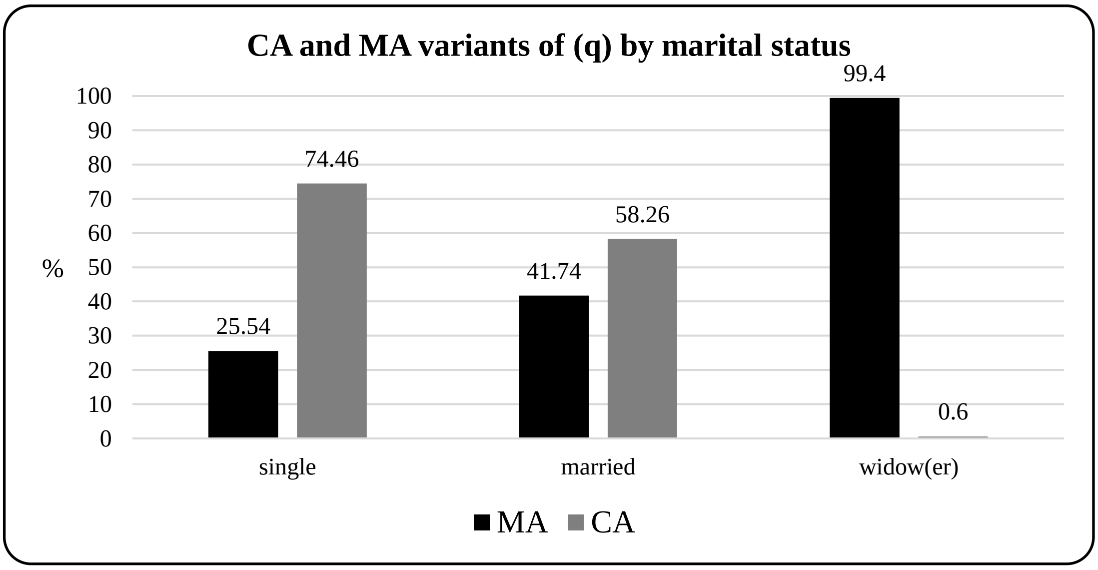


Figure 8.1*: CA and MA variants of (q) by marital status*

In the online questionnaire, participants were asked about which marital status would be more likely to trigger convergence on CA in Minya. Their responses in Table 8.2, plotted in Figure 8.2, show that they believe that convergence is more likely to occur before marriage than it is to occur after marriage, thus showing a similar pattern to the results of converging on the CA variant of (q) given in Table 8.1.

Table 8.2: *Which marital status would trigger convergence on CA in Minya?*

Marital status	**Singles**	**Fiancés and fiancées**	**Marrieds**	**Ex-spouses**	**Widow(er)s**
Number of choices	60	54	23	18	13

Evidence corroborating these results comes from a female participant interviewed in 2012. When she was asked about her daily routine, she said:

> My daily routine is nothing exciting. I get up early to prepare breakfast and take my children to school. Then, I go to work and take the children from school at 2:30. I go home, prepare lunch and do the housework. At night, I help the children with their homework and then go to bed. It is the same boring routine every day. You know, my life was much different before marriage. I used to see my friends, go out, visit relatives, go shopping, etc. Now, I am always busy with my husband, my children and housework. There is no time to live my life.

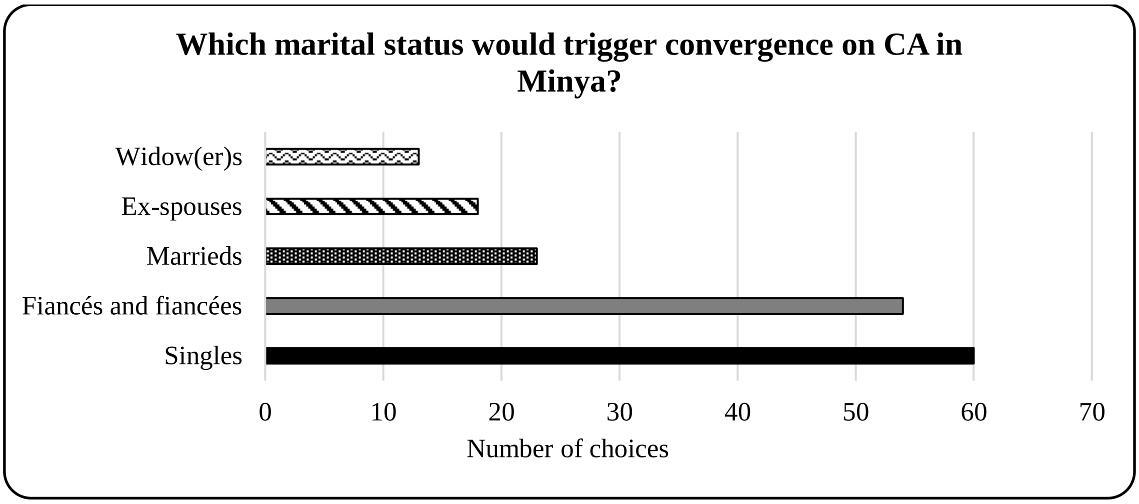


Figure 8.2: *Which marital status would trigger convergence on CA in Minya?*

To those who are familiar with the Egyptian society, the previous quote is simply a comparison between single and married females: the first frequently socialise with friends and neighbours, go shopping and visit relatives, while the latter stay home longer, are busy with familial responsibilities and do not have the time to see their friends or make new ones. This is the difference between a loose social network and a dense one, and this is probably one of the main factors responsible for language variation in general and convergence on CA in particular.

It goes without saying that the effect of marital status on convergence on CA in Minya could be collinear with other effects such as age and education, and only proper statistical analysis would show which factor is significant. Although hypothesised to be a potentially significant factor, marital status was not investigated in the current study because the participants are mainly singles and marrieds. A study that focuses on marital status should select a representative sample composed of different statuses, according to the social norms of the speech community under study. In Egypt, such a sample should ideally include: singles, fiancés and fiancées, marrieds, ex-spouses and widow(er)s.

8.3 Media

Since the media is a broad field, focus in this brief discussion pertains only to television for two reasons. TV is still the most powerful medium of communication, advertising and entertainment in Egypt, and, therefore, it is hypothesised to have a bigger effect on language variation and change than the other mediums. As for newspapers, magazines and the radio, they have a very limited effect on Egyptians, as is clear in the decreasing number of those reading newspapers and magazines (Fouad, 2016) and listening to the radio. Most participants in this study, who were interviewed in 2012, said that they seldom read newspapers or magazines and that they rarely listen to the radio, except the Holy Qur'an Radio Station (broadcast from Cairo) in the morning. Although the number of Internet users in Egypt is on the rise, estimated in 2010 to be 21.6% and 35.9% of the total population in 2016 (International Telecommunications Union, 2015 & World Factbook, 2016), the linguistic effect of the Internet is not equal to the increasing number of its users. A considerable portion of the content available online in Egypt, as is the case in Facebook used by Egyptians, also comes from TV channels. By comparison, 98.8% Egyptians have a working television in their homes, 94.1% get the news via the TV at least once a week, and 84.2% use it daily or most weekdays (Broadcasting Board of Governors, 2014).

The role that TV plays in language variation and change is controversial. TV's influence is sometimes thought to be no more than a myth (Chambers, 1998) as it does not go beyond people's picking up some salient words, phrases or fashionable pronunciations of certain words (Trudgill, 1986). As for the core systems of language, phonology and grammar, these are also believed not to be affected by the media in general unless "there is considerable linguistic distance between a national standard and local dialects (such as in Italy), and *individual dialect speakers have made a conscious decision to acquire the standard"* (italics mine) (Trudgill, 1986, p. 41). Trudgill's opinion implies that any effect TV has on speakers' choices to converge on the standard dialect is a change from above. The reason for this is that people cannot interact with TV characters as they do with real people (e.g. family members, friends, classmates, workmates) (Stuart-Smith, 2007); hence, the language variety used on TV is not expected to affect viewers. For example, the great diversity of American dialects is evidence that TV is not inducing language standardisation in America (Chambers, 1998). Likewise, if TV were linguistically significant, considering the currency of American TV in Britain, a lot of people in the British Isles would have an American accent; for instance, rhoticity might be on the increase, while in fact the opposite is happening (Trudgill, 2014). Saladino (1990) also found no significant evidence to support the hypothesis that watching standard Italian on TV led to standardisation in the phonology of a south Italian dialect used in Falerna, a village in the southern Italian province of Catanzaro. In a similar vein, Carvalho (2004) did not find any significant correlation between watching Brazilian Portuguese TV in Uruguay and the palatalisation of dental stops (ti, di) in Uruguayan Portuguese although her participants made it clear that they wanted to copy the Brazilian Portuguese that they heard on TV.

On the other hand, TV is argued by others to be a crucial factor in language variation and change. For example, Muhr (2003) showed that Austrian German was affected by German German grammatically (e.g. the emergence of the particle *mal*) and lexically (e.g. replacing core items in the Austrian German lexicon with German German counterparts) as a result of the amount of TV-viewing time, especially among children. Trying to account for TH-fronting (i.e. pronouncing /θ/ as [f] and /ð/ as [v]), a Cockney feature, in the speech of rather non-mobile working-class Norwich speakers who did not have contact with Londoners, Trudgill (1986) alluded to the role of TV programmes set in London in motivating the Norwich speakers to adopt the Cockney feature “with its stereotyped image of street-sophisticated toughness” (p. 53), maintaining that television may be part of a “softening-up” process leading to the adoption of the merger, but it does not *cause* it (p. 55). This shows that Trudgill admits that even if TV does not *cause* the diffusion of a linguistic feature, it paves the way for it. Furthermore, Williams and Kerswill (1999) suggested that the increase in radio and TV programmes, which are mostly broadcast from London and the south and directed at young people, might have a role in the spread of TH-fronting among young speakers in Hull, East Yorkshire. Stuart-Smith, Pryce, Timmins and Gunter (2013) investigated the rapid spread of two Cockney features, TH-fronting and L-vocalisation (pronunciation of /l/ in a final syllable as in *ball* and *bulk* as a vowel or semivowel), in the speech of inner-city Glaswegian adolescents. The results they reached suggest that the changes are being induced by contact with family members and friends living in England, the social meanings of the Cockney variants and strong engagement with the set-in-London TV soap opera *EastEnders* as a stimulating factor in the diffusion of the Cockney features outside London. This shows that TV “can play a role in sound change” although “this role is neither necessary nor sufficient for ‘causing’ the change”. (p. 531).

So far, studies dealing with the linguistic effect of TV in the Arab world have been centred around diglossic or multiglossic codeswitching, switching between Fuṣḥā and a colloquial form. The focus is usually on codeswitching in political speeches (see Holes' study (1993) of Abdel-Nasir's speeches and Bassiouney's study (2006) on Mubarak's speeches), religious talks/sermons (Bassiouney, 2006), news bulletins (Morsly, 1990; Doss, 2010), talk shows (Bassiouney, 2010), interviews (Eid, 2007), etc. There are hardly any studies investigating the effect of TV on the diffusion of any linguistic feature in a given Arabic dialect although the effect of some dialects is recognised. For instance, Versteegh (2001), Holes (2004, 2005) and Bassiouney (2014, 2015) all admit the effect of Egyptian TV serials and films, which are almost exclusively set in Cairo and performed in CA. Versteegh observes that (Egyptian here equals CA)

> the Egyptian dialect in particular has become known all over the Arab world, partly as a result of the export of Egyptian movies and television soaps, which are broadcast almost everywhere ... In most [Arabic] countries, almost everybody understands Egyptian Arabic, and sometimes the speakers are even able to adapt their speech to Egyptian if need be. In Yemen, for instance, foreigners who speak Arabic are automatically classified as Egyptians, and in communicating with them Yemenis will tend to use Egyptian words and even take over Egyptian morphology (p. 139).

If what Versteegh notices happens in Yemen, it is more likely still to occur in Egypt. His remark about the diffusion of CA morphology is significant since this refers to a change in the core of the language.

Although the role of TV has not been examined in the current study, participants in the online questionnaire were asked to judge how far CA and MA are appropriate for use on TV, and whether they feel they are affected by the CA they watch on TV, in their convergence on CA. Their answers to the first question in Figure 8.3 suggest that CA is considered an ideal dialect for TV and that MA is far from being so. This is actually what happens in real life in Egypt. CA is the main dialect on all types of TV channels, state and private, whether broadcast from Cairo or outside. Even the TV presenters working on these channels outside Cairo (e.g. the Alexandria TV Channel broadcast from Alexandria, the Canal TV Channel broadcast from Ismailia, and the Upper Egypt TV Channel broadcast from Minya) adopt CA, even though they are not Cairenes. Sometimes, they fail to converge on CA, and this might cause viewers to laugh at them. The situation also gets incongruous when TV presenters use CA in programmes that deal with local problems (e.g. growing wheat and a shortage of gas canisters in Minya). For instance, on the Upper Egypt TV Channel (formerly known as the 7th Channel), the most popular programme is '*Uyūn Ash-Sha'b* '*The Eyes of the People*', a true crime show about selected notorious crimes committed in the four governorates covered by the channel (Minya, Beni Suef, Faiyum and Asyut). The TV presenter is originally an MA speaker who tries to converge on CA all the time, with many failures (Googlle, 2014). Eight years ago, the researcher saw many people criticising the presenter for trying to converge on CA, wondering why he tried to speak in a soft, effeminate way [CA] when he spoke with criminals.

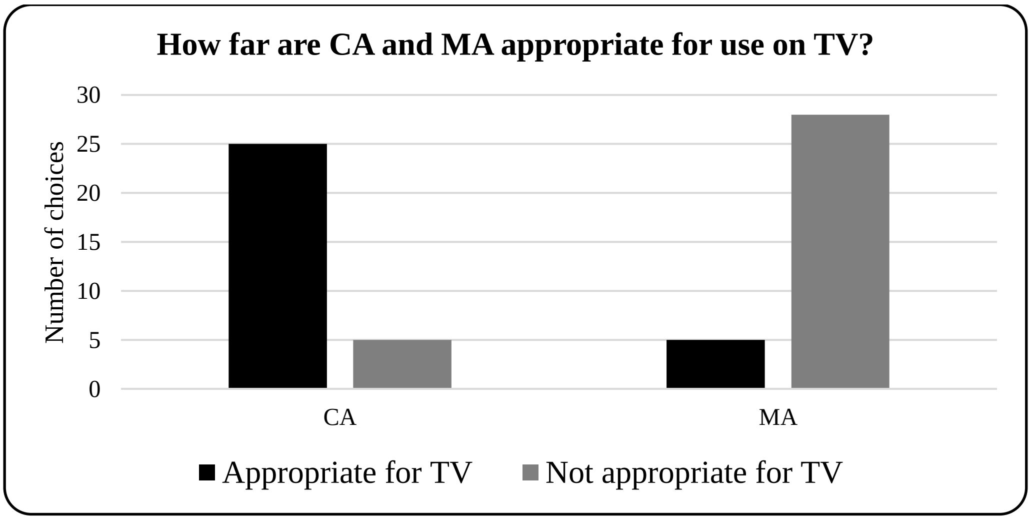


Figure 8.3: *How far are CA and MA appropriate for use on TV?*

Does watching CA on TV affect MA speakers or motivate them to converge on it? This is the second question that participants in the online questionnaire were asked to answer. Their answers in Table 8.3 show that 41.3% of respondents report that TV does affect their convergence on CA. The effect of watching TV in CA is unlikely to operate independently of other factors like gender, age and education, and investigating the role of TV in the diffusion of a linguistic feature would require a well-designed experiment. It is hypothesised here that if such a study is conducted, watching TV in CA will be found to be a significant factor in motivating speakers of other Egyptian dialects to converge on CA or, at least, will be found a stimulating factor in a way similar to the effect of watching *EastEnders* in apparently inducing the TH-fronting in Glasgow among non-mobile working-class adolescents (Stuart-Smith, Pryce, Timmins, & Gunter, 2013).

Table 8.3*: Does watching CA on TV motivate you to converge on it?*

Frequency			%	
Yes	**No**	**Total**	**Yes**	**No**
19	27	46	41.30	58.70

8.4 Religion

Like ethnicity and shared history, religion is part of identity (Bassiouney, 2014) and it might be mirrored in language use in some speech communities, especially those communities where religion is influential and whose speakers have different religious affiliations. These two conditions, the influence of religion and religious diversity, apply to most Arabic-speaking speech communities. In the Arab World, religion has a major impact on people’s lives, as is clear in the Gallup Survey (Crabtree, 2010) where adults in all the Arab countries surveyed reported that religion is an important part of their lives. In terms of religious diversity in the Arab World, all the following affiliations exist: Muslims (Sunni, Shiite, Druze, Ismaili, Alawite/ Nusayri and Ibadhi), Christians (Maronite, Melkite, Armenian, Greek Orthodox, Roman Catholic, Chaldean, Assyrian, Copt and Protestant) and Jews.

Miller (2004) maintains that religious minorities in most Arab cities have developed linguistic varieties and kept them for centuries, as in Fes and Baghdad; they have not acquired the dialects of the Muslim majority because those dialects were not associated with power or prestige, as the rulers of most Arab countries were non-Arabs up to the start of the 20th century. The situation started to change early in the 20th century, when Muslims began to take political control; this led to their linguistic variety being the koine that expanded (pp. 190-191), and in turn probably pushed minorities to have contact with dominant Muslims and to converge on their speech varieties.

An example of Miller's proposition comes from Holes' work on Bahraini Arabic (1987). In Bahrain, the sectarian differences between the Shiite Baharnas and Sunni Arabs are reflected in language as used by both sects. The first form the oldest population in Bahrain and have traditional rural origins, while the latter, who currently control political power, are descendants of Bedouin tribes that migrated to Bahrain in the 18th century. A linguistic difference between the two sects is the realisation of the salient (q): the Shiite variant is [q], which is identical to the Fuṣḥā variant, while the Sunni variant is [g]. Because of the economic changes that took place in Bahrain following the 1973 War and the boom in oil prices, which led to more development, the Shiite Baharnas, originally sailmakers living in the countryside, started to be in more contact with the Sunni Arabs. This means that the social networks of the Shiite Baharnas became loose, especially as this coincided with a policy initiated by the state to spread education, which brought the Shiites and Sunnis into greater contact. Since the Sunni Arabs were superior economically and politically, the Shiite Baharnas started to converge on the Sunni dialect that became the national standard used on TV (Holes, 2005). Recent work on Bahraini Arabic (Al-Qouz, 2009, as cited in Holes, 2013 and Al-Wer, Horesh, Herin & Fanis, 2015) shows that the traditional Shiite linguistic features have levelled out in the modern dialect of the capital city, Manama, towards the dialect of the Sunnis, as expected by Holes (1987). In a similar vein, in Baghdad, Christians and Jews converge on Muslim Baghdadi Arabic because the latter is the dialect of the economically and politically powerful group (Muslims) (Blanc, 1964, Abu-Haidar, 1990).

In speech communities where contact is limited between a religious minority and the majority, the minority may maintain some conservative features. This is what Woidich (1996) reports regarding the Christian village of ‘Izbat ilBasîli on the West Bank of Luxor in Upper Egypt. ‘Izbat ilBasîli is located in a Muslim environment, and the dialect used in the village diverges from the dialect of the rest of the region. Woidich believes that this is because, in contrast to the Muslims living in this area, Christians did not mix with the Bedouin tribes and, therefore, kept their dialect intact, away from any Bedouin features characteristic of the region. In a similar way, Al-Wer, Horesh, Herin and Fanis (2015) found that Christians in two Jordanian communities, Salt and Horan, are more conservative and retain some traditional features due to the lack of intermarriage between them and Muslims, thereby showing “religion as an important constraint on linguistic variation” (p. 84).

In present-day Egypt, the main religions are Islam and Christianity. The proportion of Christians is debatable, but is estimated to be between 5.3% (Pew Forum on Religion & Public Life, 2011) and 10% (Central Intelligence Agency, 2016). Considering the fact that the total population of Egypt is 90 million people (CAPMAS, 2016), Christians in Egypt could mount to between 4.77 and 9 million people. Although religion is very influential in the lives of Muslims and Christians alike, religion-correlated linguistic differences are claimed to be limited to religious lexical items and names (Woidich, 2006a; Bassiouney, 2014). In this connection, Bassiouney (2014) claims that

> religion as an independent variable does not seem to influence linguistic variation in Egypt, at least on a phonological level. Apart from religious lexical references and names, both Muslims and Christians share social networks and linguistic varieties. Of

> course, not all Egyptians speak the same variety, but independent variables, such as social class, locality, and even gender, are more salient and consistently influential than religion. In my opinion, this is because religious groups do not necessarily form communities of practice in Egypt. (p. 186).

The reason for the lack of salient linguistic differences between Muslims and Christians in Egypt, as maintained by Bassiouney, is that they do not form separate communities of practice; both Muslims and Christians live as neighbours in the same buildings, eat the same food, dress the same, etc. This could be true, as Christians are generally spread across Egypt and hardly form any agglomerations except in a few districts in big cities (e.g. Shubra in Cairo) and villages in Upper Egypt (e.g. Tahna Al-Jabal in Minya). Nevertheless, there is no study supporting the claim that thre are no linguistic differences between Muslims and Christians in Egypt, and this lack of studies is taken by Bassiouney (2014) as evidence that there is nothing salient/different to investigate.

In the present study, there are 5 Christian participants out of the 62 interviewed in 2012, (that is about 8% of the total) and this is less than the proportion of Christians in Minya, which is estimated at 13% (Mohamoud, Cuadros & Abu-Raddad, 2013). Minya is one of the governorates with the highest proportion of Christians in Egypt; indeed, Minya is ranked fourth in terms of the proportion of Christians relative to Muslims (Mohamoud, Cuadros & Abu-Raddad, 2013). Because the number of Christian participants in the present study is neither proportional to that of Muslim participants nor representative of the number of Christians in Minya, religion was not included as a social factor. Nevertheless, the distribution of the CA and MA variants of (q) and (stress) by religion shows a consistent difference between the Muslim and Christian participants. The Muslims converge on the CA variants more than do the Christians, as shown in Table 8.4, contrary to the researcher's expectation. If there is a discussion about linguistic differences between Muslims and Christians in Egypt, Christians are generally believed to use CA more than Muslims. Actually, this is the very opinion voiced by a Christian participant as an answer to the question that the researcher posed to him regarding the differences between Muslims and Christians in the working-class district where he lived.

Table 8.4: *CA and MA variants of (q) and (stress) by religion*

Religion	(q)					(stress)				
	Frequency			%		Frequency			%	
	MA	CA	Total	MA	CA	MA	CA	Total	MA	CA
Christian	176	160	336	52.38	47.62	77	109	186	41.40	58.60
Muslim	1290	2438	3728	34.60	65.40	687	1906	2593	26.49	73.51
	1466	2598	4064			764	2015	2779		

The current results might suggest that Christians in Minya retain MA conservative features more than their Muslim fellows. Thus, this result is similar to those reported in Woidich (1996) and Al-Wer, Horesh, Herin and Fanis (2015). The effect of religion here is probably not independent of other factors (e.g. place of residence or gender) and only a study that has a balanced sample of Muslims and Christians would confirm or disconfirm, based on a full statistical analysis, the trends and patterns observed in the present sample.

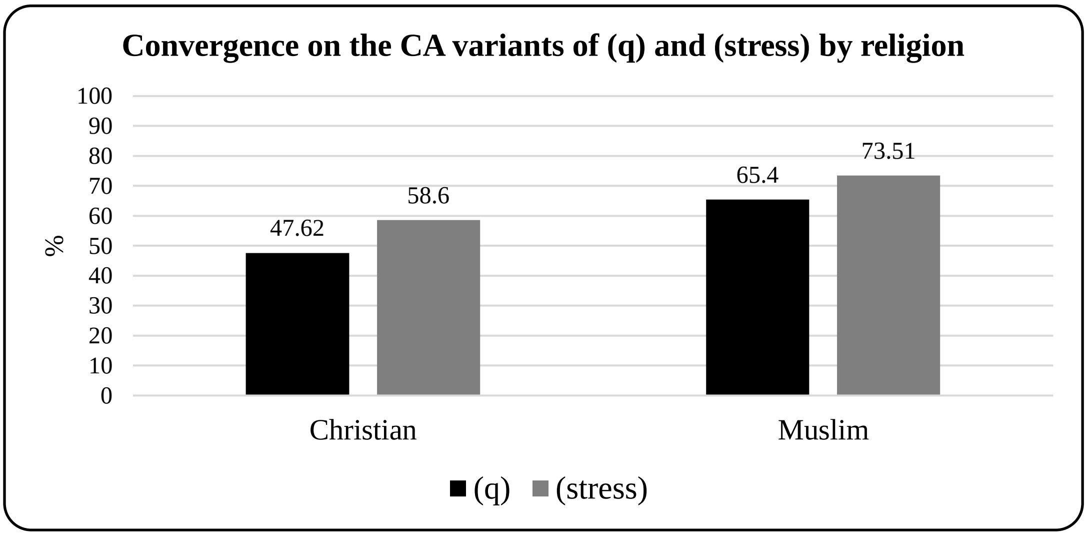


Figure 8.4: *Convergence on the CA variants of (q) and (stress) by religion*

8.5 Recommended Future Studies of Convergence on CA in Minya

In addition to the five variables investigated in the present study, there are many other variables that could be explored in future studies regarding the convergence of MA on CA. (dʒ) is a salient variable that should be tackled. In Chapter Five on variation in vowels, there is a list (see Table 5.1) of 28 vocalic variables given as differences between CA and MA, only three of which (i.e. KaLLiM, XaLLiF and WaSSaL) have been investigated here. The remaining 25 variables are all worthy of study to reveal the variation in MA. Variation in stress has been investigated in the current study, maybe for the first time in Arabic variationist studies. Hellmuth (2014) suggests that variation in intonation in spoken Arabic is another area that should be explored in future studies. Thus, intonational differences, in addition to the huge number of lexical differences between CA and MA, could also be investigated so as to provide a full picture of variation in MA.

8.6 Conclusion

In this Chapter, evidence from the literature has been presented to show that marital status, exposure to TV and religion can be potential factors of language variation and change. This has been linked to the present study and investigated via looking at the data comprising the study (recorded interviews and perception questionnaire). Based on analysing the convergence on CA in the (q) and (stress) datasets, it has been argued that marital status and religion could be significant factors in motivating convergence on CA in Minya, although neither of these has been analysed statistically since the sample of the current study is not representative in respect of these two factors. Exposure to CA on TV has also been argued to play a role in inducing convergence on CA in Minya, which is to some extent supported by the questionnaire results; indeed, participants see that their convergence on CA is affected by watching CA on TV by 41.30%. Future studies could validate or invalidate these propositions.

Appendix 1: Information on Participants

#	Participant	Gender	Age	Education	Place of residence
1	UMYV1-1	male	21	university	villager
2	PMYT1-3	male	26	postgraduate	migrant
3	SMOV1-4	male	83	secondary or below	villager
4	UMMiV1-5	male	36	university	villager
5	PMMiV2-1	male	39	postgraduate	villager
6	UFYUr2-2	female	19	university	urbanite
7	UFYV2-3	female	19	university	villager
8	UMYV3-1	male	20	university	villager
9	UFYUr3-2	female	19	university	urbanite
10	UFYV4-1	female	19	university	villager
11	PFYT5-1	female	27	postgraduate	migrant
12	UMYV5-2	male	21	university	villager
13	PMYUr5-3	male	26	postgraduate	urbanite
14	UMMiV5-4	male	31	university	villager
15	PMYV5-5	male	27	postgraduate	villager
16	SFMiUr6-1	female	35	secondary or below	urbanite
17	SFMiUr6-2	female	40	secondary or below	urbanite
18	SMOUr6-3	male	55	secondary or below	urbanite
19	PFYUr6-4	female	25	postgraduate	urbanite
20	UFYUr6-5	female	20	university	urbanite
21	PFYUr6-6	female	29	postgraduate	urbanite
22	UFYUr6-7	female	29	university	urbanite
23	UMMiUr6-8	male	43	university	urbanite
24	PMOUr6-9	male	60	postgraduate	urbanite
25	UMYUr6-10	male	21	university	urbanite
26	PFYUr6-11	female	25	postgraduate	urbanite
27	SFYUr6-12	female	26	secondary or below	urbanite
28	PFOUr6-13	female	61	postgraduate	urbanite
29	PMMiT7-1	male	42	postgraduate	migrant
30	UFYUr7-2	female	21	university	urbanite

31	UMMiT7-3	male	34	university	migrant
32	SFMiUr7-4	female	34	secondary or below	urbanite
33	SMYT7-5	male	20	secondary or below	migrant
34	SMYUr7-6	male	19	secondary or below	urbanite
35	SMOUr7-7	male	64	secondary or below	urbanite
36	UMOT7-8	male	48	university	migrant
37	SMOUr7-9	male	57	secondary or below	urbanite
38	SFOUr7-10	female	53	secondary or below	urbanite
39	PFMiV8-1	female	31	postgraduate	villager
40	UFYV8-2	female	27	university	villager
41	UMMiV8-3	male	31	university	villager
42	SMMiV8-4	male	43	secondary or below	villager
43	SMYV8-5	male	24	secondary or below	villager
44	SMMiV8-6	male	50	secondary or below	villager
45	SFOV8-7	female	65	secondary or below	villager
46	UMYV8-8	male	30	university	villager
47	UMMiUr9-1	male	34	university	urbanite
48	PFYUr9-2	female	26	postgraduate	urbanite
49	UFYV9-3	female	20	university	villager
50	UFYV9-4	female	20	university	villager
51	UFYV9-5	female	20	university	villager
52	SFMiUr10-1	female	43	secondary or below	urbanite
53	UFYV10-2	female	22	university	villager
54	UFMiV10-3	female	36	university	villager
55	UMYUr10-4	male	20	university	urbanite
56	UMYV10-5	male	26	university	villager
57	PMMiT10-6	male	32	postgraduate	migrant
58	UFYUr10-7	female	20	university	urbanite
59	UFYV11-1	female	19	university	villager
60	UMOV11-2	male	60	university	villager
61	UMMiV11-3	male	40	university	villager
62	UMYV11-4	male	21	university	villager

Appendix 2

ROMANIZATION SYSTEM FOR ARABIC

BGN/PCGN 1956 System

This System was adopted by the BGN in 1946 and by the PCGN in 1956 and is applied in the systematic romanization of geographic names in Bahrain, Egypt, Iraq, Jordan, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and Yemen.

Uniform results in the romanization of Arabic are difficult to obtain, since vowel points and diacritical marks are generally omitted from both manual and machine writing. It follows that for correct identification of the words which appear in any particular name, knowledge of its standard Arabic-script spelling including proper pointing, and recognition of dialectal and idiosyncratic deviations are essential.

In order to bring about uniformity in the Roman-script spelling of geographic names in Arabic-language areas, the system is based insofar as possible on fully pointed modern standard Arabic. In the interest of clarity, vowel pointing has been applied to the examples below. Arabic is written from right to left, and does not make a distinction between upper and lower case.

CONSONANT CHARACTERS

	Arabic				Romanization	Examples and Remarks	
	Final	Medial	Initial	Independent			
1.	ء				*not romanized in word-initial position*	أبو كَمَالْ	Abū Kamāl
					’ in all other positions	بِئرْ زَيتْ	Bi’r Zayt [2]
						صَنعَاءْ	Şan‘ā’
2.	ـا		ا		*not romanized in word-initial position*	أم العَمَدْ	Umm al ‘Amad [3]
3.	ـب	ـبـ	بـ	ب	b	البَحْرَينْ	Al Baḩrayn
4.	ـت	ـتـ	تـ	ت	t	الكوتْ	Al Kūt
5.	ـث	ـثـ	ثـ	ث	th	الثُلَيثُوَاتْ	Ath Thulaythuwāt
6.	ـج	ـجـ	جـ	ج	j	الجَزيرَة	Al Jazīrah
7.	ـح	ـحـ	حـ	ح	ḩ	المَحْمُودِيَة	Al Maḩmūdīyah
8.	ـخ	ـخـ	خـ	خ	kh	خَيبَرْ	Khaybar
9.	ـد		د		d	دَمَنهُورْ	Damanhūr
10.	ـذ		ذ		dh	ذَهَبْ	Dhahab
11.	ـر		ر		r	الرَوْضَة	Ar Rawḑah
12.	ـز		ز		z	الزَاوِيَة	Az Zāwīyah
13.	ـس	ـسـ	سـ	س	s	سُلَيمَانِيَة	Sulaymānīyah
14.	ـش	ـشـ	شـ	ش	sh	الشَامْ	Ash Shām
15.	ـص	ـصـ	صـ	ص	ş	قَيصُومَة	Qayşūmah

	Arabic				Romanization	Examples and Remarks	
	Final	Medial	Initial	Independent			
16.	ـض	ـضـ	ضـ	ض	ḍ	ضَوْر	Ḍawr
17.	ـط	ـطـ	طـ	ط	ṭ	القُنَيطِرَة	Al Qunayṭirah
18.	ـظ	ـظـ	ظـ	ظ	ẓ	أبو ظَبِي	Abū Ẓaby
19.	ـع	ـعـ	عـ	ع	ʻ	أبو عَرِيْش	Abū ʻArīsh
20.	ـغ	ـغـ	غـ	غ	gh	بَغْدَاد	Baghdād
21.	ـف	ـفـ	فـ	ف	f	الفُرات	Al Furāt
22.	ـق	ـقـ	قـ	ق	q	قَطَر	Qaṭar
23.	ـك	ـكـ	كـ	ك	k	الكُوَيت	Al Kuwayt
24.	ـل	ـلـ	لـ	ل	l	حَلَب	Ḥalab
25.	ـم	ـمـ	مـ	م	m	مَكَّة	Makkah
26.	ـن	ـنـ	نـ	ن	n	نَخْل	Nakhl
27.	ـه	ـهـ/ـهـ	هـ	ه	h	جَبَل هَارُوْن	Jabal Hārūn
28.	ـو		و		w	وَادِي غَضا	Wādī Ghaḍā
29.	ـي	ـيـ	يـ	ي	y	اليَمَن	Al Yaman

VOWEL CHARACTERS AND DIACRITICAL MARKS

	Arabic	Romanization	Examples and Remarks	
1.	◌َ	a	البَصْرَة	Al Baṣrah
2.	◌ِ	i	الرِياض	Ar Riyāḍ
3.	◌ُ	u	القُدْس	Al Quds
4.	◌َ ا	ā	بَاب المَنْدَب	Bāb al Mandab [3]
5.	◌ِ ي	ī	المَدِيْنَة	Al Madīnah
6.	◌ُ و	ū	صُور	Ṣūr
7.	◌َ ى ىٰ	á	مَرْسَى مَطْرُوح	Marsá Maṭrūḥ [7]
8.	◌ْ	*not romanized*	*Indicates absence of a short vowel.*	
9.	◌َ يْ	ay	صَيْدا	Ṣaydā
10.	◌َ وْ	aw	الدَّوْحَة	Ad Dawḥah
11.	◌ً	a^n	*See note 8*	
12.	◌ٍ	i^n	*See note 8*	
13.	◌ٌ	u^n	*See note 8*	
14.	◌ّ	*doubling of consonant letter*	*See note 9*	
15.	أ	ʼ	*See note 10*	
16.	آ	*ā in word-initial position*	آلبُومُعَيط	Ālbū Muʻayṭ [3,11]
		ʼā in word-medial position	قُرآن	Qurʼān [3]

NUMERALS									
١	٢	٣	٤	٥	٦	٧	٨	٩	٠
1	2	3	4	5	6	7	8	9	0

Although Perso-Arabic script is written from right to left, numerical expressions, e.g., 1956 - ١٩٥٦ are written from left to right.

NOTES

1. The symbol ○ represents any Arabic consonant character.

2. *Hamzah* (ء) is written in Arabic in association with most instances of initial *alif*, except those which belong to the definite article **al** or which bear a *maddah* (see note 11). *Hamzah* is written above the *alif* if the accompanying short vowel is a *fatḩah* (أ) or ḑammah (أ) and below the *alif* if the accompanying short vowel is a *kasrah* (إ). When the purpose is to indicate the presence of a glottal stop, *hamzah* is written over medial and final *alif* (أ), *wāw* (ؤ) and *yā'* without dots (ئ). *Hamzah* following *kasrah* (○ِ) is written (ئ). Almost always the *yā'* is in the initial or medial form and the dots are omitted: example: (بئر). *Hamzah* following *ḑammah* (○ُ) is written (ؤ). *Hamzah* following a long vowel is written without a bearer and is positioned on the line of print like a regular character. The romanization of *hamzah* (') should always be carefully distinguished from that of *'ayn* (').

3. *Alif* as such is not romanized when it is a bearer of *hamzah*, but see *fatḩah alif* (○َا) and *alif maddah* (آ) in the vowel table. See also note 2 and 11 above.

4. In certain endings, an original *tā'* (ت) is written (ة), i.e., like *hā'* with two dots, and is known as *tā marbūṭah*. It is romanized **h**, except in the construct form, where it is romanized **t** instead. Example: *hamzah, hamzat al qaṭ'* . The ending *fatḩah hā'* (○َه) may be romanized **a·h** when the character *hā'* (ه) is not silent. Example: **Muntaza·h**. See also note 5.

5. Occasionally, the character sequences كهـ, تهـ, دهـ and سهـ occur. They may be romanized **k·h, t·h, d·h, and s·h** in order to differentiate those romanizations from the digraphs **kh, th, dh, and sh**. See also note 4.

6. Where special considerations are paramount, the sub-dot (̣) may be used in place of the cedilla.

7. The character *yā'* (in final form but without dots) preceded by the vowel point *fatḩah* is a combination known as *alif maqşūrah*. See character 7 in the vowel table.

8. The classical Arabic grammatical endings written with the nunation symbols (*tanwīn*) may be romanized, when necessary, by **a**^{n}, **i**^{n}, **u**^{n}. In modern Arabic, these endings have become silent and should not be romanized: classical *alifu*^{n} modern *alif*.

9. Doubled consonant sounds are represented in Arabic script by placing a *shaddah* (○ّ) over a consonant character. In romanization the letter should be doubled. However, the combination of the consonant character yā' with a *shaddah* preceded by a *kasrah* (ـيِّـ) is romanized īy rather than iyy. e.g., (ـيِّة) is romanized (**īyah)** and not (**iyyah)**.

When the definite article (al) precedes a word beginning with one of the "sun letters" t, th, d, dh, r, z, s, sh, ṣ, ḍ, ṭ, ẓ , l, or n – the l is assimilated in pronunciation and romanization, thus yielding **tt, thth**, etc., in romanization. Example, **An Nīl**, not **Al Nīl**.

10. *Hamzat al waṣl* (ٱ), which is utilized only in the pointing of classical Arabic, is romanized ʼ as illustrated in the classical form of its name *hamzatu'l waṣli.*

11. Since *maddah* (آ), which is placed over *alif* (ا), nearly always occurs in word-initial position, no confusion results from the use of **ā** for *alif maddah* (آ) as well as for *fatḥah alif* (ـَا).

12. The ligatures لا and ﻼ represent *lām- alif*, and should be romanized **lā**.

SPECIAL RULES

1. Initial definite articles and prepositions should be capitalized and hyphens should not be used to connect parts of names, e.g., **Ash Shāriqah** and **Tall al La□m**.

2. If any evidence is found for the use of the definite article in a name, the article should be used in the name chosen.

3. The Arabic word for God should be written **Allāh** (الله).

4. Names which consist of noun phrases should be written as separate words. The definite article within such names should be romanized **al**, not **ul**, e.g., ʻ**Abd Allāh**, ʻ**Abd ar Ra□mān**, **Dhū al Faqār**.

5. The Arabic word بن should be romanized **Bin** rather than **Ibn** whenever written without *alif*, that is between two proper nouns, e.g., **ʻ**Umar Bin al Khaṭṭāb.

6. The Turkish word **Paşa** should be romanized from Arabic script as **Bāshā**. The Turkish word **Bey** should be romanized as **Bey** in Egyptian names, no matter how it is written in Arabic-language sources, but in other Arabic areas it should be romanized as **Bak** where written بك and as **Bayk** when written بيك.

7. The modern colloquial word **Sīdī** should be give precedence over the classical form **Sayyidī**. This does not preclude the spelling **Sayyidī** if the latter is indicated by the Arabic script or other evidence – for instance, if the *yā'* is written with a *shaddah* (ّ).

8. The colloquial word **Bū** should not be changed to the standard form **Abū**.

9. The colloquial word for water, written مية on Arabic maps, should be romanized **Mayyat**.

10. Place names of Aramaic origin in Syria often contain initial consonant clusters consisting of **b**

plus another consonant such as **l or h**. In romanization, the clusters **bl, bh,** etc., should be so represented.

11. In names containing the Arabic word for back, ridge, or hill, appearing as either ظهر or ضهر in Arabic sources, the word should be romanized to reflect the particular Arabic spelling shown.

Appendix 3: A Sample of Transcription from the (q) Dataset

participant	item	preceding_sound	following_sound	convergence	style	gender	education	age	residence
SFMiUr6-1	tʊʔaf	V	V	CA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔalam	P	V	CA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ga:ʕɪd	P	V	MA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔʊdda:mʊ	P	V	CA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔɪzazteːn	P	V	CA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	tˤɑbɑʔ	V	P	CA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	wagt	V	C	MA	careful	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	jɪgʊllak	C	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	dɪ-l-waʔtɪ	V	C	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	baʔa	V	V	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	waʔfa	V	C	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	lɪgɪ:t	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	galli	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	jɪgʊllɪ	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	wagfa	V	C	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	gʊlt	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ħagɪ:ga	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	galli	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	jɪʕʃaʔ	V	P	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	gʊltɪlʊ	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	gɪɾʃ	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔagall	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	jɪnaggɪ:ha	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔɪs-suːʔ	V	P	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔɪs-suːg	V	P	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	jɪnaggɪ:ha	V	V	MA	casual	F	secondary or below	middle-aged	urbanite

SFMiUr6-1	tɑgtˤɪ:ʕ	V	C	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	tɑgtˤɪ:ʕ	V	C	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	suːg	V	P	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	bɪn-naggi	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	gɪsm	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔɪl-gɪza:z	P	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	bɪn-la:gi	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	dɪ-l-wagt	V	C	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	waɾaʔa	V	V	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	dɪ-l-wagti	V	C	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔɪl-wɑɾˤɑg	V	P	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	lɪgɪ:tʊ	V	V	MA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	ʔɪl-waɾaʔa	V	V	CA	casual	F	secondary or below	middle-aged	urbanite
SFMiUr6-1	wagfa	V	C	MA	casual	F	secondary or below	middle-aged	urbanite
UMMiV8-3	tɪgaf	V	V	MA	careful	M	university	middle-aged	villager
UMMiV8-3	galam	P	V	MA	careful	M	university	middle-aged	villager
UMMiV8-3	ʔa:ʕɪd	P	V	CA	careful	M	university	middle-aged	villager
UMMiV8-3	ʔʊdda:mʊ	P	V	CA	careful	M	university	middle-aged	villager
UMMiV8-3	gɪzazteːn	P	V	MA	careful	M	university	middle-aged	villager
UMMiV8-3	waɾaʔa	V	V	CA	careful	M	university	middle-aged	villager
UMMiV8-3	bʊʔʔak	V	V	CA	careful	M	university	middle-aged	villager
UMMiV8-3	tˤɑbɑg	V	P	MA	careful	M	university	middle-aged	villager
UMMiV8-3	ʔɪl-wakti	V	C	MA	careful	M	university	middle-aged	villager
UMMiV8-3	wɪgɪʕt	V	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	jʊwgaʕʊ	C	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	ʔaʔʊllʊ	V	V	CA	casual	M	university	middle-aged	villager
UMMiV8-3	ma-bgɪt-ʃ	C	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	jʊbʔʊ	C	V	CA	casual	M	university	middle-aged	villager
UMMiV8-3	ʔaʔdˤɑɾˤ	V	C	CA	casual	M	university	middle-aged	villager
UMMiV8-3	tɪħaʔʔaʔ	V	V	CA	casual	M	university	middle-aged	villager
UMMiV8-3	ʔɪl-waxti	V	C	MA	casual	M	university	middle-aged	villager
UMMiV8-3	dɪ-l-waxti	V	C	MA	casual	M	university	middle-aged	villager

UMMiV8-3	tɪlʔa	C	V	CA	casual	M	university	middle-aged	villager
UMMiV8-3	tɪlga	C	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	dɪ-l-wagt	V	C	MA	casual	M	university	middle-aged	villager
UMMiV8-3	ʔagall	V	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	baʔa	V	V	CA	casual	M	university	middle-aged	villager
UMMiV8-3	jɪgallɪd	V	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	gʊlt	P	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	gadɪ:ma	P	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	gadɪ:ma	P	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	b-agʕʊd	V	C	MA	casual	M	university	middle-aged	villager
UMMiV8-3	gʊlajjɪl	P	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	gɑsˤdˤi	P	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	baga	V	V	MA	casual	M	university	middle-aged	villager
UMMiV8-3	dɪ-l-wagti	V	C	MA	casual	M	university	middle-aged	villager
V = vowel, C = consonant, P = pause; M = male, F = female									

Appendix 4: Statistical Results

1. The (q) Dataset

```
> m0.null.qaaf   <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data = q
aaf, family = "binomial")
> summary(m0.null.qaaf)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ 1 + (1 | speaker) + (1 | item)
   Data: qaaf

     AIC      BIC   logLik deviance df.resid
   954.5    973.4   -474.3    948.5     4061

Scaled residuals:
     Min       1Q   Median       3Q      Max
-16.5990  -0.0305   0.0010   0.0053   1.5774

Random effects:
 Groups  Name        Variance Std.Dev.
 item    (Intercept)  22.38    4.73
 speaker (Intercept) 268.67   16.39
Number of obs: 4064, groups:  item, 1309; speaker, 62

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)   10.213      1.236   8.261   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Max.qaaf.1 <- glmer (convergence ~ age + gender + education + residence +
age:education + age:residence + gender:education + gender:residence +
education:residence + style + preceding_sound + following_sound + (1 +
style + preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence + style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.2 <- glmer (convergence ~ age + gender + education + residence
+ age:residence + gender:education + gender:residence + education:residence
+ style + preceding_sound + following_sound + (1 + style + preceding_sound
+ following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.3 <- glmer (convergence ~ age + gender + education + residence
+ gender:education + gender:residence + education:residence + style +
preceding_sound + following_sound + (1 + style + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.4 <- glmer (convergence ~ age + gender + education + residence
+  gender:residence + education:residence + style + preceding_sound +
following_sound + (1 + style + preceding_sound + following_sound | speaker)
```

```
+ (1 + age + gender + education + residence + style| item), data = qaaf,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max. qaaf.5 <- glmer (convergence ~ age + gender + education + residence
+  education:residence + style + preceding_sound + following_sound + (1 +
style + preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence + style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.6 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + style + preceding_sound
+ following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.qaaf.7 <- glmer (convergence ~ age + gender + education + residence +
style + preceding_sound + following_sound + (1 + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.8 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + following_sound |
speaker) + (1 + age + gender + education + residence + style| item), data =
qaaf, family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max. qaaf.9 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 + age +
gender + education + residence + style| item), data = qaaf,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max. qaaf.10 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 + gender +
education + residence + style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.11 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 +
education + residence + style| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.12 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 +
education + residence| item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.13 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 +
education | item), data = qaaf, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max. qaaf.14 <- glmer (convergence ~ age*gender + education + residence +
style + preceding_sound + following_sound + (1 | speaker) + (1 + education
| item), data = qaaf, family='binomial',
```

```
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

**************************************************************************
> Max.qaaf.15 <- glmer (convergence ~ age + gender + education + residence
+ age:gender + education: residence +  style + preceding_sound + following_
sound + (1  | speaker)+ (1 + education | item), data = qaaf,family='binomia
l', control=glmerControl(optimizer=c("bobyqa"),optCtrl=list(maxfun=2e5), nA
GQ = 1))
> summary(Max.qaaf.15)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + age:gender +
      education:residence + style + preceding_sound + following_sound +
      (1 | speaker) + (1 + education | item)
Data: qaaf
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5), nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1188.4   1352.5   -568.2   1136.4     4038

Scaled residuals:
     Min       1Q   Median       3Q      Max
-11.1830  -0.0306   0.0046   0.0233   6.2174

Random effects:
 Groups      Name                   Variance Std.Dev. Corr
 item        (Intercept)            1.104   1.051
             educationuniversity     1.205   1.098    -0.84
             educationpostgraduate  1.153   1.074     0.82 -0.38
 speaker     (Intercept)            44.494   6.670
Number of obs: 4064, groups:  item, 1309; speaker, 62

Fixed effects:
                                       Estimate Std. Error z value Pr(>|z|)
(Intercept)                             -6.0142     3.6967  -1.627 0.103751
agemiddle-aged                          -7.2027     4.1051  -1.755 0.079335 .
ageold                                  -1.8566     3.9279  -0.473 0.636455
gendermale                              -1.9674     2.5173  -0.782 0.434481
educationuniversity                      8.6098     3.5949   2.395 0.016618 *
educationpostgraduate                   17.4996     6.4144   2.728 0.006369 **
residencemigrant                         7.3145     7.2263   1.012 0.311442
residenceurbanite                       14.5534     4.2896   3.393 0.000692 ***
stylecasual                             -2.7199     0.3309  -8.221  < 2e-16 ***
preceding_soundpause                    -1.2833     0.3785  -3.390 0.000698 ***
preceding_soundvowel                    -0.4241     0.3231  -1.312 0.189392
following_soundpause                     1.5744     0.4374   3.599 0.000319 ***
following_soundvowel                     1.4737     0.3821   3.857 0.000115 ***
agemiddle-aged:gendermale                8.3663     4.8969   1.708 0.087547 .
ageold:gendermale                       -0.3641     5.1398  -0.071 0.943519
educationuniversity:residencemigrant    -0.8168     9.7665  -0.084 0.933347
educationpostgraduate:residencemigrant  -9.7417     9.6239  -1.012 0.311427
educationuniversity:residenceurbanite   -5.3977     4.8086  -1.123 0.261641
educationpostgraduate:residenceurbanite -11.7416    7.6810  -1.529 0.126347
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

**************************************************************************
```

```
> dropterm(Max.qaaf.15, scale = 0, test ="Chisq", k = 2, sorted = FALSE, tr
ace = TRUE)
trying - style
trying - preceding_sound
trying - following_sound
trying - age:gender
trying - education:residence
Single term deletions

Model:
convergence ~ age + gender + education + residence + age:gender +
    education:residence + style + preceding_sound + following_sound +
    (1 | speaker) + (1 + education | item)
                    Df    AIC    LRT   Pr(Chi)
<none>                 1188.4
style                1 1256.0 69.536 < 2.2e-16 ***
preceding_sound      2 1198.1 13.706 0.0010564 **
following_sound      2 1202.2 17.823 0.0001348 ***
age:gender           2 1187.3  2.867 0.2384256
education:residence  4 1182.6  2.181 0.7025965
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.qaaf.1 <-update(Max.qaaf.15, .~.-education:residence)
> summary(Redu.qaaf.1)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + style +
    preceding_sound + following_sound + (1 | speaker) + (1 +
    education | item) + age:gender
   Data: qaaf
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1182.6   1321.4   -569.3   1138.6     4042

Scaled residuals:
     Min       1Q   Median       3Q      Max
-10.9749  -0.0313   0.0040   0.0241   6.2137

Random effects:
 Groups       Name                   Variance Std.Dev. Corr
 item        (Intercept)            1.048   1.024
              educationuniversity    1.130   1.063    -0.83
              educationpostgraduate  1.216   1.103     0.85 -0.42
 speaker      (Intercept)           44.728   6.688
Number of obs: 4064, groups:  item, 1309; speaker, 62

Fixed effects:
                          Estimate Std. Error z value Pr(>|z|)
(Intercept)                -4.1495     3.5218  -1.178 0.238704
agemiddle-aged             -4.1648     3.6717  -1.134 0.256665
ageold                     -1.8109     4.3695  -0.414 0.678543
gendermale                 -2.0143     2.4850  -0.811 0.417606
educationuniversity         6.1771     2.8489   2.168 0.030142 *
educationpostgraduate       8.8129     3.0091   2.929 0.003404 **
residencemigrant            5.2531     3.8781   1.355 0.175555
residenceurbanite          10.0278     2.1555   4.652 3.28e-06 ***
stylecasual                -2.7100     0.3295  -8.224  < 2e-16 ***
```

```
preceding_soundpause       -1.2789     0.3778  -3.386 0.000710 ***
preceding_soundvowel       -0.4234     0.3225  -1.313 0.189321
following_soundpause        1.5723     0.4363   3.604 0.000314 ***
following_soundvowel        1.4695     0.3813   3.853 0.000116 ***
agemiddle-aged:gendermale   5.5614     4.7036   1.182 0.237063
ageold:gendermale           0.4144     5.1179   0.081 0.935464
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

***************************************************************************
> dropterm(Redu.qaaf.1, scale = 0, test ="Chisq", k = 2, sorted = FALSE, tr
ace = TRUE)
trying - education
trying - residence
trying - style
trying - preceding_sound
trying - following_sound
trying - age:gender
Single term deletions

Model:
convergence ~ age + gender + education + residence + style + preceding_soun
d + following_sound + (1 | speaker) + (1 + education | item) + age:gender
                Df    AIC    LRT   Pr(Chi)
<none>             1182.6
education        2 1187.4  8.826 0.0121189 *
residence        2 1199.6 21.030 2.712e-05 ***
style            1 1250.1 69.482 < 2.2e-16 ***
preceding_sound  2 1192.3 13.651 0.0010856 **
following_sound  2 1196.4 17.836 0.0001339 ***
age:gender       2 1180.0  1.447 0.4850992
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.qaaf.2 <-update(Redu.qaaf.1, .~.- age:gender)
> summary Redu.qaaf.2)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + style +
    preceding_sound + following_sound + (1 | speaker) + (1 +      education
 | item)
Data: qaaf
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1180.1   1306.3   -570.0   1140.1     4044

Scaled residuals:
     Min       1Q   Median       3Q      Max
-11.1280  -0.0306   0.0045   0.0248   6.1691

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)            1.078   1.038
              educationuniversity    1.165   1.079    -0.84
              educationpostgraduate  1.209   1.100     0.85 -0.42
 speaker      (Intercept)           47.742   6.910
Number of obs: 4064, groups:  item, 1309; speaker, 62
```

```
Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -5.9872     2.9982  -1.997 0.045829 *
agemiddle-aged         -0.5152     2.1873  -0.236 0.813803
ageold                 -1.2347     2.7223  -0.454 0.650153
gendermale             -0.6365     1.8709  -0.340 0.733695
educationuniversity     7.6012     2.5013   3.039 0.002375 **
educationpostgraduate   9.6270     2.7865   3.455 0.000551 ***
residencemigrant        6.1633     3.8891   1.585 0.113022
residenceurbanite      10.3296     2.1303   4.849 1.24e-06 ***
stylecasual            -2.7138     0.3303  -8.217  < 2e-16 ***
preceding_soundpause   -1.2824     0.3783  -3.390 0.000698 ***
preceding_soundvowel   -0.4255     0.3229  -1.318 0.187572
following_soundpause    1.5751     0.4371   3.604 0.000314 ***
following_soundvowel    1.4734     0.3820   3.857 0.000115 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

***************************************************************************
> dropterm(Redu.qaaf.2, scale = 0, test ="Chisq", k = 2, sorted = FALSE, tr
ace = TRUE)
trying - age
trying - gender
trying - education
trying - residence
trying - style
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ age + gender + education + residence + style +
    preceding_sound + following_sound + (1 | speaker) + (1 +
    education | item)
                Df    AIC    LRT   Pr(Chi)
<none>             1180.0
age              2 1176.3  0.206 0.9021824
gender           1 1178.2  0.115 0.7348238
education        2 1188.0 11.970 0.0025161 **
residence        2 1197.4 21.366 2.294e-05 ***
style            1 1247.5 69.443 < 2.2e-16 ***
preceding_sound  2 1189.7 13.675 0.0010730 **
following_sound  2 1193.9 17.853 0.0001328 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.qaaf.3 <-update(Redu.qaaf.2, .~.- age)
> summary(Redu.qaaf.3)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ gender + education + residence + style + preceding_s
ound +
    following_sound + (1 | speaker) + (1 + education | item)
Data: qaaf
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),     nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1176.3   1289.8   -570.1   1140.3     4046
```

```
Scaled residuals:
     Min       1Q   Median       3Q      Max
-11.1076  -0.0304   0.0043   0.0244   6.1410

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)            1.084   1.041
              educationuniversity    1.171   1.082    -0.84
              educationpostgraduate  1.215   1.102     0.84 -0.41
 speaker      (Intercept)           48.142   6.938
Number of obs: 4064, groups:  item, 1309; speaker, 62

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -6.6071     2.7083  -2.440 0.014705 *
gendermale             -0.8742     1.8074  -0.484 0.628602
educationuniversity     8.1443     2.2538   3.614 0.000302 ***
educationpostgraduate   9.8515     2.7240   3.617 0.000299 ***
residencemigrant        6.5316     3.8860   1.681 0.092799 .
residenceurbanite      10.3876     2.1114   4.920 8.67e-07 ***
stylecasual            -2.7141     0.3303  -8.217  < 2e-16 ***
preceding_soundpause   -1.2840     0.3783  -3.394 0.000689 ***
preceding_soundvowel   -0.4265     0.3230  -1.321 0.186602
following_soundpause    1.5749     0.4374   3.601 0.000317 ***
following_soundvowel    1.4740     0.3825   3.854 0.000116 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.qaaf.3, scale = 0, test ="Chisq", k = 2, sorted = FALSE, tr
ace = TRUE)
trying - gender
trying - education
trying - residence
trying - style
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ gender + education + residence + style + preceding_sound +
    following_sound + (1 | speaker) + (1 + education | item)
                Df    AIC    LRT   Pr(Chi)
<none>             1176.3
gender           1 1174.5  0.234 0.6287342
education        2 1188.0 15.720 0.0003859 ***
residence        2 1194.9 22.597 1.239e-05 ***
style            1 1243.7 69.429 < 2.2e-16 ***
preceding_sound  2 1186.0 13.700 0.0010593 **
following_sound  2 1190.1 17.839 0.0001337 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.qaaf.4 <-update(Redu.qaaf.3, .~.- gender)
> summary(Redu.qaaf.4)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ education + residence + style + preceding_sound +
    following_sound + (1 | speaker) + (1 + education | item)
Data: qaaf
```

```
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),  nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1174.5   1281.8   -570.2   1140.5     4047

Scaled residuals:
     Min       1Q   Median       3Q      Max
-11.1296  -0.0296   0.0043   0.0237   6.1298

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)            1.090   1.044
              educationuniversity    1.175   1.084    -0.84
              educationpostgraduate  1.232   1.110     0.85 -0.42
 speaker      (Intercept)           48.857   6.990
Number of obs: 4064, groups: item, 1309; speaker, 62

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -7.3143     2.2699  -3.222 0.001271 **
educationuniversity     8.2926     2.2264   3.725 0.000196 ***
educationpostgraduate  10.0536     2.7108   3.709 0.000208 ***
residencemigrant        6.3316     3.9857   1.589 0.112157
residenceurbanite      10.6913     2.0143   5.308 1.11e-07 ***
stylecasual            -2.7157     0.3305  -8.217  < 2e-16 ***
preceding_soundpause   -1.2852     0.3785  -3.395 0.000686 ***
preceding_soundvowel   -0.4270     0.3231  -1.322 0.186247
following_soundpause    1.5747     0.4376   3.598 0.000320 ***
following_soundvowel    1.4742     0.3828   3.851 0.000117 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> anova(Max.qaaf.15, Redu.qaaf.4)
Data: qaaf
Models:
Redu.qaaf.4: convergence ~ education + residence + style + preceding_sound
            + following_sound + (1 | speaker) + (1 + education | item)
Max.qaaf.1: convergence ~ age + gender + education + residence + age:gender
            +education:residence + style + preceding_sound + following_sou
          nd + (1 | speaker) + (1 + education | item)
             Df    AIC    BIC  logLik deviance Chisq Chi Df Pr(>Chisq)
Redu.qaaf.4  17 1174.5 1281.8 -570.25   1140.5
Max.qaaf.15  26 1188.4 1352.5 -568.21   1136.4 4.067      9     0.9069

***************************************************************************
> probs = 1/(1+exp(-fitted(Max.qaaf.15)))
> somers2(probs, as.numeric(qaaf$convergence)-1)
          C          Dxy            n       Missing
   0.9933579    0.9867158 4064.0000000    0.0000000
> probs = 1/(1+exp(-fitted(Redu.qaaf.4)))
> somers2(probs, as.numeric(qaaf$convergence)-1)
         C         Dxy           n     Missing
   0.993339    0.986678 4064.000000    0.000000
```

2. The Vowels Datasets

2.1 The (Kallim) dataset

```
> m0.null.kallim  <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
kallim, family = "binomial")
> summary(m0.null.kallim )
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ 1 + (1 | speaker) + (1 | item)
   Data: kallim

     AIC      BIC   logLik deviance df.resid
   341.0    353.0   -167.5    335.0      396

Scaled residuals:
     Min       1Q   Median       3Q      Max
-1.01857 -0.09830  0.00595  0.00719  1.78654

Random effects:
 Groups  Name        Variance Std.Dev.
 item    (Intercept) 578.60   24.054
 speaker (Intercept)  24.16    4.915
Number of obs: 399, groups:  item, 239; speaker, 62

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)   10.164      1.119   9.085   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
>  Max.kallim.1 <- glmer (convergence ~ age + gender + education +
residence +age:education + age:residence + gender:education +
gender:residence + education:residence + style + preceding_sound +
following_sound + (1 + style + preceding_sound + following_sound | speaker)
+ (1 + age + gender + education + residence + style| item), data = kallim,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.kallim.2 <- glmer (convergence ~ age + gender + education + residence
+age:residence + gender:education + gender:residence + education:residence
+style + preceding_sound + following_sound + (1 + style + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.3 <- glmer (convergence ~ age + gender + education + residence
+gender:education + gender:residence + education:residence + style +
preceding_sound + following_sound + (1 + style + preceding_sound +
following_sound| speaker) + (1 + age + gender + education + residence +
style| item), data= kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.4 <- glmer (convergence ~ age + gender + education + residence
+gender:residence + education:residence + style + preceding_sound +
following_sound + (1 + style + preceding_sound + following_sound | speaker)
+ (1 + age + gender + education + residence + style| item), data = kallim,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

```
> Max.kallim.5 <- glmer (convergence ~ age + gender + education + residence
+education:residence + style + preceding_sound + following_sound + (1 +
style + preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence + style| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.6 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + style + preceding_sound
+ following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.7 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.8 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + following_sound |
speaker) + (1 + age + gender + education + residence + style| item), data =
kallim, family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.kallim.9 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 + age +
gender + education + residence + style| item), data = kallim,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.kallim.10 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ gender + education + residence + style| item), data = kallim,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.kallim.11 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ education + residence + style| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.12 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ education + residence| item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.13 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ education | item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.kallim.14 <- glmer (convergence ~ age*gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 +
education | item), data = kallim, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.kallim.15 <- glmer (convergence ~ age*gender + education*residence +
style + preceding_soun + following_sound + (1 | speaker) + (1 + education |
 item), data = kallim, family='binomial', control=glmerControl(optimizer=c(
"bobyqa"), optCtrl=list(maxfun=2e5), nAGQ = 1))

> summary(Max.kallim.15)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age * gender + education * residence + style +  prec
eding_sound + following_sound + (1 | speaker) + (1 + education | item)
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
   385.1    488.8   -166.6    333.1      373

Scaled residuals:
    Min     1Q    Median      3Q     Max
-3.4814 -0.2884  0.1631  0.4636  3.7865

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 speaker      (Intercept)           0.8744   0.9351
 item         (Intercept)           0.1671   0.4088
              educationuniversity   0.5503   0.7418   -1.00
              educationpostgraduate 0.7657   0.8750   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                                      Estimate Std. Error z value Pr(>|z|)
(Intercept)                          -0.853953   1.120968  -0.762   0.4462
agemiddle-aged                       -1.476968   0.946323  -1.561   0.1186
ageold                               -2.579624   1.232176  -2.094   0.0363 *
gendermale                           -0.675824   0.688358  -0.982   0.3262
educationuniversity                   2.039036   0.990935   2.058   0.0396 *
educationpostgraduate                 3.302433   1.490817   2.215   0.0267 *
residencemigrant                     -0.368882   1.778806  -0.207   0.8357
residenceurbanite                     1.475276   0.965572   1.528   0.1265
stylecasual                          -0.181246   0.461156  -0.393   0.6943
preceding_sounddorsal                 1.008852   0.447063   2.257   0.0240 *
preceding_soundlabial                 0.877717   0.610367   1.438   0.1504
following_sounddorsal                 1.120813   0.604718   1.853   0.0638 .
following_soundlabial                -0.001078   0.429562  -0.002   0.9980
agemiddle-aged:gendermale             0.697185   1.153801   0.604   0.5457
ageold:gendermale                     1.061149   1.443034   0.735   0.4621
educationuniversity:residencemigrant  2.329629   2.223157   1.048   0.2947
educationpostgraduate:residencemigrant -0.001238 2.165401  -0.001   0.9995
educationuniversity:residenceurbanite  0.325138  1.193676   0.272   0.7853
educationpostgraduate:residenceurbanite 1.538678 1.937510   0.794   0.4271
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
*************************************************************************
```

```
> dropterm(Max.kallim.15, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - style
trying - preceding_sound
trying - following_sound
trying - age:gender
trying - education:residence
Single term deletions

Model:
convergence ~ age * gender + education * residence + style +
    preceding_sound + following_sound + (1 | speaker) + (1 + education | it
em)
                    Df    AIC    LRT Pr(Chi)
<none>                 385.13
style                1 383.29 0.1558 0.69307
preceding_sound      2 386.83 5.6961 0.05796 .
following_sound      2 385.12 3.9885 0.13612
age:gender           2 382.24 1.1045 0.57566
education:residence  4 380.47 3.3344 0.50349
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.kallim.1 <- update(Max.kallim.15, . ~ . - style)
> summary(Redu.kallim.1)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + preceding_sou
nd +
    following_sound + (1 | speaker) + (1 + education | item) +
    age:gender + education:residence
   Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
   383.3    483.0   -166.6    333.3      374

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.4648 -0.2884  0.1571  0.4697  3.7581

Random effects:
 Groups        Name                  Variance Std.Dev. Corr
 speaker      (Intercept)           0.8883   0.9425
 item         (Intercept)           0.1808   0.4252
              educationuniversity   0.5183   0.7199   -1.00
              educationpostgraduate 0.7855   0.8863   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                                     Estimate Std. Error z value Pr(>|z|)
(Intercept)                         -0.999423   1.061956  -0.941   0.3466
agemiddle-aged                      -1.477389   0.949529  -1.556   0.1197
ageold                              -2.577032   1.236329  -2.084   0.0371 *
gendermale                          -0.680131   0.689315  -0.987   0.3238
educationuniversity                  2.054410   0.988436   2.078   0.0377 *
educationpostgraduate                3.284642   1.488363   2.207   0.0273 *
residencemigrant                    -0.335929   1.779689  -0.189   0.8503
```

```
residenceurbanite                          1.470562   0.969309   1.517   0.1292
preceding_sounddorsal                      1.018753   0.446232   2.283   0.0224 *
preceding_soundlabial                      0.855156   0.603679   1.417   0.1566
following_sounddorsal                      1.102891   0.602174   1.831   0.0670 .
following_soundlabial                     -0.029761   0.424999  -0.070   0.9442
agemiddle-aged:gendermale                  0.692628   1.157362   0.598   0.5495
ageold:gendermale                          1.053122   1.448081   0.727   0.4671
educationuniversity:residencemigrant       2.257470   2.216709   1.018   0.3085
educationpostgraduate:residencemigrant     0.001753   2.170709   0.001   0.9994
educationuniversity:residenceurbanite      0.297758   1.194222   0.249   0.8031
educationpostgraduate:residenceurbanite    1.563542   1.941209   0.805   0.4206
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.kallim.1, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - preceding_sound
trying - following_sound
trying - age:gender
trying - education:residence
Single term deletions

Model:
convergence ~ age +gender + education + residence+ preceding_sound+ followi
ng_sound + (1 | speaker) + (1 + education | item) + age:gender + education:
residence
                    Df    AIC    LRT Pr(Chi)
<none>                 383.29
preceding_sound      2 385.00 5.7163 0.05737 .
following_sound      2 384.21 4.9207 0.08541 .
age:gender           2 379.92 0.6359 0.72764
education:residence  4 378.54 3.2510 0.51673
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

> Redu.kallim.2 <- update(Redu.kallim.1, . ~ . - age:gender)
> summary(Redu.kallim.2)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + preceding_sou
nd +
    following_sound + (1 | speaker) + (1 + education | item) +
    education:residence
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
   379.9    471.7   -167.0    333.9      376

Scaled residuals:
    Min     1Q    Median    3Q     Max
-3.2602 -0.3032  0.1613  0.4846  4.0488

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 speaker     (Intercept)           0.9945   0.9973
 item        (Intercept)           0.1821   0.4267
             educationuniversity   0.5377   0.7333   -1.00
```

```
              educationpostgraduate 0.7541   0.8684   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                                        Estimate Std. Error z value Pr(>|z|)
(Intercept)                             -1.36902    0.99186  -1.380   0.1675
agemiddle-aged                          -1.08224    0.57750  -1.874   0.0609 .
ageold                                  -1.86229    0.81058  -2.297   0.0216 *
gendermale                              -0.29842    0.50963  -0.586   0.5582
educationuniversity                      2.29623    0.98659   2.327   0.0199 *
educationpostgraduate                    3.47019    1.53016   2.268   0.0233 *
residencemigrant                        -0.36150    1.82430  -0.198   0.8429
residenceurbanite                        1.53405    0.94211   1.628   0.1035
preceding_sounddorsal                    1.00218    0.45188   2.218   0.0266 *
preceding_soundlabial                    0.82629    0.60341   1.369   0.1709
following_sounddorsal                    1.06602    0.60229   1.770   0.0767 .
following_soundlabial                   -0.01279    0.42822  -0.030   0.9762
educationuniversity:residencemigrant     2.37049    2.27342   1.043   0.2971
educationpostgraduate:residencemigrant   0.15486    2.21195   0.070   0.9442
educationuniversity:residenceurbanite    0.30037    1.17619   0.255   0.7984
educationpostgraduate:residenceurbanite  1.47975    1.97330   0.750   0.4533
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
****************************************************************************
> dropterm(Redu.kallim.2, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - gender
trying - preceding_sound
trying - following_sound
trying - education:residence
Single term deletions

Model:
convergence ~ age + gender + education + residence + preceding_sound +
    following_sound + (1 | speaker) + (1 + education | item) + education:re
sidence
                    Df    AIC    LRT Pr(Chi)
<none>                 379.92
age                  2 382.54 6.6219 0.03648 *
gender               1 378.26 0.3385 0.56067
preceding_sound      2 381.37 5.4466 0.06566 .
following_sound      2 379.61 3.6880 0.15818
education:residence  4 374.91 2.9924 0.55910
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
****************************************************************************
> Redu.kallim.3 <- update(Redu.kallim.2, . ~ . - gender)
> summary(Redu.kallim.3)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + education + residence + preceding_sound +
    following_sound + (1 | speaker) + (1 + education | item) + education:re
sidence
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
```

```
   378.3    466.0   -167.1    334.3      377

Scaled residuals:
    Min      1Q   Median   3Q     Max
-3.3189 -0.2879  0.1610  0.4660  4.0419

Random effects:
 Groups        Name                  Variance Std.Dev. Corr
 speaker      (Intercept)            1.0363   1.0180
 item         (Intercept)           0.1808   0.4252
              educationuniversity    0.5042   0.7101   -1.00
              educationpostgraduate 0.8898   0.9433   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                                     Estimate Std. Error z value Pr(>|z|)
(Intercept)                          -1.54543    0.95226  -1.623   0.1046
agemiddle-aged                       -1.17437    0.56384  -2.083   0.0373 *
ageold                               -1.96395    0.80301  -2.446   0.0145 *
educationuniversity                   2.31502    0.98731   2.345   0.0190 *
educationpostgraduate                 3.60618    1.50359   2.398   0.0165 *
residencemigrant                     -0.47313    1.83200  -0.258   0.7962
residenceurbanite                     1.71172    0.90347   1.895   0.0581 .
preceding_sounddorsal                 0.99764    0.45068   2.214   0.0269 *
preceding_soundlabial                 0.84499    0.60953   1.386   0.1657
following_sounddorsal                 1.06532    0.60311   1.766   0.0773 .
following_soundlabial                -0.02729    0.42626  -0.064   0.9489
educationuniversity:residencemigrant    2.42616    2.29100   1.059   0.2896
educationpostgraduate:residencemigrant  0.17918    2.23212   0.080   0.9360
educationuniversity:residenceurbanite   0.16649    1.16188   0.143   0.8861
educationpostgraduate:residenceurbanite 1.29276    1.95905   0.660   0.5093
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
****************************************************************************
> dropterm(Redu.kallim.3, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - preceding_sound
trying - following_sound
trying - education:residence
Single term deletions

Model:
convergence ~ age + education + residence + preceding_sound +
    following_sound + (1 | speaker) + (1 + education | item) + education:re
sidence
                    Df    AIC    LRT Pr(Chi)
<none>                 378.26
age                  2 382.97 8.7065 0.01287 *
preceding_sound      2 379.66 5.4015 0.06715 .
following_sound      2 378.85 4.5843 0.10105
education:residence  4 373.14 2.8778 0.57848
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
****************************************************************************
> Redu.kallim.4 <- update(Redu.kallim.3, . ~ . - education:residence)
> summary(Redu.kallim.4)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
Family: binomial  ( logit )
```

```
Formula: convergence ~ age + education + residence + preceding_sound +
    following_sound + (1 | speaker) + (1 + education | item)
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)
     AIC      BIC   logLik deviance df.resid
   373.1    444.9   -168.6    337.1      381

Scaled residuals:
   Min      1Q    Median   3Q     Max
-2.7313 -0.2878  0.1452  0.4669  3.8796

Random effects:
 Groups        Name                  Variance Std.Dev. Corr
 speaker      (Intercept)           1.2751   1.1292
 item         (Intercept)          0.1976   0.4445
              educationuniversity   0.5155   0.7180   -1.00
              educationpostgraduate 0.9524   0.9759   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -2.00877    0.86151  -2.332 0.019718 *
agemiddle-aged        -1.15196    0.54902  -2.098 0.035885 *
ageold                -1.48125    0.74080  -2.000 0.045553 *
educationuniversity    2.84036    0.81517   3.484 0.000493 ***
educationpostgraduate  3.99330    1.07007   3.732 0.000190 ***
residencemigrant       0.49975    0.79840   0.626 0.531358
residenceurbanite      2.06853    0.56421   3.666 0.000246 ***
preceding_sounddorsal  1.00935    0.45570   2.215 0.026765 *
preceding_soundlabial  0.80818    0.60967   1.326 0.184971
following_sounddorsal  1.05002    0.60448   1.737 0.082378 .
following_soundlabial -0.04378    0.42544  -0.103 0.918031
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.kallim.4, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - education
trying - residence
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ age + education + residence + preceding_sound +
            following_sound + (1 | speaker) + (1 + education | item)
                Df    AIC     LRT   Pr(Chi)
<none>             373.14
age              2 375.55  6.4123 0.0405131 *
education        2 397.34 28.2007 7.521e-07 ***
residence        2 385.01 15.8680 0.0003583 ***
preceding_sound  2 374.45  5.3107 0.0702725 .
following_sound  2 372.83  3.6921 0.1578562
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.kallim.5 <- update(Redu.kallim.4, . ~ . - following_sound)
> summary(Redu.kallim.5)
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + education + residence + preceding_sound +
        (1 | speaker) + (1 + education | item)
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
   372.8    436.7   -170.4    340.8      383

Scaled residuals:
    Min      1Q  Median    3Q     Max
-3.1495 -0.3010  0.1493  0.4646  3.5171

Random effects:
 Groups        Name                  Variance Std.Dev. Corr
 speaker      (Intercept)            1.4299   1.1958
 item          (Intercept)           0.2227   0.4719
              educationuniversity   0.7777   0.8818   -1.00
              educationpostgraduate 1.1296   1.0628   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -1.8342     0.7960  -2.304 0.021210 *
agemiddle-aged         -1.1348     0.5630  -2.016 0.043830 *
ageold                 -1.4343     0.7598  -1.888 0.059060 .
educationuniversity     2.8778     0.8503   3.384 0.000714 ***
educationpostgraduate   4.1533     1.0683   3.888 0.000101 ***
residencemigrant        0.4165     0.8222   0.507 0.612448
residenceurbanite       2.1508     0.5801   3.708 0.000209 ***
preceding_sounddorsal   0.7996     0.4189   1.909 0.056318 .
preceding_soundlabial   0.8104     0.5706   1.420 0.155562
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
***************************************************************************
> dropterm(Redu.kallim.5, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - education
trying - residence
trying - preceding_sound
Single term deletions

Model:
convergence ~ age + education + residence + preceding_sound +
    (1 | speaker) + (1 + education | item)
                Df    AIC     LRT   Pr(Chi)
<none>             372.83
age              2 374.73  5.9028  0.052267 .
education        2 396.39 27.5567  1.038e-06 ***
residence        2 384.98 16.1447  0.000312 ***
preceding_sound  2 373.42  4.5879  0.100867
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
***************************************************************************
> Redu.kallim.6 <- update(Redu.kallim.5, . ~ . - preceding_sound)
> summary(Redu.kallim.6)
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ age + education + residence + (1 | speaker) + (1 +
        education | item)
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
   373.4    429.3   -172.7    345.4      385

Scaled residuals:
    Min     1Q    Median    3Q     Max
-3.9458 -0.2972  0.1538  0.4586  3.6907

Random effects:
 Groups       Name                   Variance Std.Dev. Corr
 speaker      (Intercept)            1.5187   1.2323
 item         (Intercept)            0.2116   0.4600
              educationuniversity    0.7616   0.8727   -1.00
              educationpostgraduate 0.3386   0.5819   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -1.3856     0.7556  -1.834 0.066685 .
agemiddle-aged         -1.1247     0.5678  -1.981 0.047606 *
ageold                 -1.4156     0.7651  -1.850 0.064290 .
educationuniversity     2.8480     0.8301   3.431 0.000602 ***
educationpostgraduate   3.9913     0.9860   4.048 5.17e-05 ***
residencemigrant        0.4881     0.8381   0.582 0.560283
residenceurbanite       2.2103     0.5822   3.796 0.000147 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.kallim.6, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - education
trying - residence
Single term deletions

Model:
convergence ~ age + education + residence + (1 | speaker) + (1 + education
| item)
          Df    AIC     LRT   Pr(Chi)
<none>       373.42
age        2 375.08  5.6602 0.0590064 .
education  2 397.11 27.6931 9.695e-07 ***
residence  2 385.91 16.4906 0.0002625 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.kallim.7 <- update(Redu.kallim.6, . ~ . - age)
> summary(Redu.kallim.7)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ education + residence + (1 | speaker) + (1 +educatio
n| item)
```

```
Data: kallim
Control: glmerControl(optimizer= c("bobyqa"), optCtrl=list(maxfun = 2e+05),
nAGQ= 1)

     AIC      BIC   logLik deviance df.resid
   375.1    422.9   -175.5    351.1      387

Scaled residuals:
    Min      1Q   Median   3Q     Max
-4.8773 -0.2672  0.1706  0.4570  3.3359

Random effects:
 Groups       Name                     Variance Std.Dev. Corr
 speaker      (Intercept)              1.6025   1.2659
 item         (Intercept)              0.3248   0.5699
              educationuniversity      1.0145   1.0072   -1.00
              educationpostgraduate 0.5299   0.7280   -1.00  1.00
Number of obs: 399, groups:  speaker, 62; item, 239

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -2.4231     0.6882  -3.521  0.00043 ***
educationuniversity     3.3775     0.8239   4.099 4.14e-05 ***
educationpostgraduate   4.1843     0.9940   4.210 2.56e-05 ***
residencemigrant        0.4746     0.8559   0.555  0.57922
residenceurbanite       2.4027     0.5872   4.092 4.28e-05 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
**************************************************************************
> anova(Max.kallim.15, Redu.kallim.7)
Data: kallim
Models:
Redu.kallim.7: convergence ~ education+ residence+(1|speaker) + (1+educatio
n|item)
Max.kallim.15: convergence ~ age*gender + education*residence + style +
         preceding_sound + following_sound + (1 | speaker) + (1 + education
| item)
                 Df    AIC    BIC  logLik deviance  Chisq Chi Df Pr(>Chisq)
Redu.kallim.7     12 375.08 422.95 -175.54   351.08
Max.kallim.15     26 385.13 488.84 -166.56   333.13 17.948     14     0.2091
***************************************************************************
> probs = 1/(1+exp(-fitted(Max.kallim.15)))
> somers2(probs, as.numeric(kallim$convergence)-1)
      C         Dxy           n     Missing
  0.9112120   0.8224241 399.0000000   0.0000000
> probs = 1/(1+exp(-fitted(Redu.kallim.7)))
> somers2(probs, as.numeric(kallim$convergence)-1)
      C         Dxy           n     Missing
  0.9215097   0.8430195 399.0000000   0.0000000
```

2.2 The (XaLLiF) dataset

```
> m0.null.xallif  <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
xallif, family = "binomial")
> summary(m0.null.xallif)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ 1 + (1 | speaker) + (1 | item)
   Data: allim
```

```
     AIC      BIC   logLik deviance df.resid
   142.7    151.6    -68.4    136.7      140

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.6817 -0.2617 -0.1342  0.2383  1.2719

Random effects:
 Groups  Name        Variance Std.Dev.
 item    (Intercept)  1.32    1.149
 speaker (Intercept) 15.72    3.965
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)  -0.5806     0.9825  -0.591    0.555
***************************************************************************
```

```
> Max.xallif.1 <- glmer (convergence ~ age + gender + education + residence
+ age:education + age:residence + gender:education + gender:residence +
education:residence + preceding_sound + following_sound + (1 +
preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence | item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.xallif.2 <- glmer (convergence ~ age + gender + education + residence
+ age:residence + gender:education + gender:residence + education:residence
+ preceding_sound + following_sound + (1 + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence |
item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.xallif.3 <- glmer (convergence ~ age + gender + education + residence
+ gender:education + gender:residence + education:residence +
preceding_sound + following_sound + (1 + preceding_sound + following_sound
| speaker) + (1 + age + gender + education + residence | item), data =
xallif, family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.xallif.4 <- glmer (convergence ~ age + gender + education + residence
+  gender:residence + education:residence + preceding_sound +
following_sound + (1 + preceding_sound + following_sound | speaker) + (1 +
age + gender + education + residence| item), data = xallif,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.xallif.5 <- glmer (convergence ~ age + gender + education + residence
+  education:residence + preceding_sound + following_sound + (1 +
preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence | item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.xallif.6 <- glmer (convergence ~ age + gender + education + residence
+ preceding_sound + following_sound + (1 + preceding_sound +
```

```
following_sound | speaker) + (1 + age + gender + education + residence +|
item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.xallif.7 <- glmer (convergence ~ age + gender + education + residence
+ preceding_sound + following_sound + (1 + following_sound | speaker) + (1
+ age + gender + education + residence | item), data = xallif,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))
```

```
> Max.xallif.8 <- glmer (convergence ~ age + gender + education + residence
+ preceding_sound + following_sound + (1 | speaker) + (1 + age + gender +
education + residence | item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.xallif.9 <- glmer (convergence ~ age + gender + education + residence
+ preceding_sound + following_sound + (1 | speaker) + (1 + gender +
education + residence | item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.xallif.10 <- glmer (convergence ~ age + gender + education +
residence + preceding_sound + following_sound + (1 | speaker) + (1 +
education + residence | item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.xallif.11 <- glmer (convergence ~ age + gender + education +
residence + preceding_sound + following_sound + (1 | speaker) + (1 +
education | item), data = xallif, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.xallif.12 <- glmer (convergence ~ age*gender + education + residence
+ preceding_sound + following_sound + (1 | speaker) + (1+ education | item)
, data = xallif,family='binomial', control=glmerControl(optimizer=c("bobyqa
"), optCtrl=list(maxfun=2e5), nAGQ = 1))
> summary(Max.xallif.12)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ age * gender + education + residence + preceding_sou
nd +
         following_sound + (1 + education | item) + (1 | speaker)
Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
 nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
   134.7    196.9    -46.4     92.7      122

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.27155 -0.00436 -0.00001  0.18188  2.15873

Random effects:
```

```
 Groups       Name                 Variance Std.Dev. Corr
 item        (Intercept)          516.631  22.730
              educationuniversity   519.661  22.796   -1.00
              educationpostgraduate 520.758  22.820   -1.00  1.00
 speaker      (Intercept)             3.402   1.844
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                          Estimate Std. Error z value Pr(>|z|)
(Intercept)               -15.0585     8.6766  -1.736   0.0826 .
agemiddle-aged             -4.8245     3.9874  -1.210   0.2263
ageold                      4.1315     9.9939   0.413   0.6793
gendermale                 -0.8628     1.8811  -0.459   0.6465
educationuniversity        17.1368     8.7302   1.963   0.0497 *
educationpostgraduate      17.3696     8.4145   2.064   0.0390 *
residencemigrant            3.0707     2.6274   1.169   0.2425
residenceurbanite           2.8809     1.9541   1.474   0.1404
preceding_sounddorsal       7.8890     6.8071   1.159   0.2465
preceding_soundlabial      -1.8929     1.0949  -1.729   0.0838 .
following_sounddorsal      -1.1095     2.0044  -0.554   0.5799
following_soundlabial      -1.8642     0.9806  -1.901   0.0573 .
agemiddle-aged:gendermale   3.7095     4.7459   0.782   0.4344
ageold:gendermale          -8.3319    10.7850  -0.772   0.4398
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
**********************************************************************
> dropterm(Max.xallif.12, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - education
trying - residence
trying - preceding_sound
trying - following_sound
trying - age:gender
Single term deletions

Model:
convergence ~ age * gender + education + residence + preceding_sound +
             following_sound + (1 + education | item) + (1 | speaker)
                Df    AIC     LRT   Pr(Chi)
<none>             134.72
education        2 145.37 14.6531 0.0006578 ***
residence        2 134.35  3.6338 0.1625283
preceding_sound  2 138.07  7.3542 0.0252965 *
following_sound  2 134.83  4.1097 0.1281092
age:gender       2 131.88  1.1591 0.5601398
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
*********************************************************************
> Redu.xallif.1 <- update(Max.xallif.12, . ~ . - age:gender)
> summary(Redu.xallif.1)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + preceding_sou
nd +
        following_sound + (1 + education | item) + (1 | speaker)
Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
 nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
```

```
   131.9    188.2    -46.9     93.9      124

Scaled residuals: 
  Min       1Q       Median   3Q      Max 
-2.18772 -0.00482 -0.00001  0.20955  2.03383 

Random effects:
 Groups       Name                  Variance Std.Dev. Corr       
 item        (Intercept)           594.115  24.374               
              educationuniversity   594.803  24.389   -1.00      
              educationpostgraduate 595.040  24.393   -1.00  1.00
 speaker      (Intercept)             3.507   1.873               
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)  
(Intercept)           -13.8290     6.7609  -2.045   0.0408 *
agemiddle-aged         -2.5011     2.2346  -1.119   0.2630  
ageold                 -5.0778     3.3627  -1.510   0.1310  
gendermale             -0.1264     1.6558  -0.076   0.9392  
educationuniversity    15.7338     6.7395   2.335   0.0196 *
educationpostgraduate  16.2978     6.6165   2.463   0.0138 *
residencemigrant        3.5205     2.5803   1.364   0.1724  
residenceurbanite       2.5576     1.8695   1.368   0.1713  
preceding_sounddorsal   5.6475     4.6538   1.214   0.2249  
preceding_soundlabial  -1.8045     1.0870  -1.660   0.0969 .
following_sounddorsal  -1.1737     2.0127  -0.583   0.5598  
following_soundlabial  -1.7461     0.9582  -1.822   0.0684 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.xallif.1, scale = 0, test ="Chisq", k = 2, sorted = FALSE, 
trace = TRUE)
trying - age 
trying - gender 
trying - education 
trying - residence 
trying - preceding_sound 
trying - following_sound 
Single term deletions

Model:
convergence ~ age + gender + education + residence + preceding_sound + 
             following_sound + (1 + education | item) + (1 | speaker)
                Df    AIC     LRT   Pr(Chi)    
<none>             131.88                      
age              2 130.77  2.8918 0.2355372    
gender           1 129.88  0.0013 0.9714655    
education        2 142.42 14.5428 0.0006951 ***
residence        2 131.45  3.5721 0.1676198    
preceding_sound  2 134.68  6.8065 0.0332655 *  
following_sound  2 131.64  3.7683 0.1519608    
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.xallif.2 <- update(Redu.xallif.1, . ~ . - gender)
> summary(Redu.xallif.2)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ age + education + residence + preceding_sound +
```

```
        following_sound + (1 + education | item) + (1 | speaker)
Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
   129.9    183.2    -46.9     93.9      125

Scaled residuals:
   Min      1Q      Median    3Q      Max
-2.19441 -0.00480 -0.00001  0.21311  2.03734

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)           618.554  24.871
              educationuniversity   619.285  24.885   -1.00
              educationpostgraduate 619.493  24.890   -1.00  1.00
 speaker      (Intercept)             3.528   1.878
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -13.9476     6.6658  -2.092   0.0364 *
agemiddle-aged         -2.5680     2.0754  -1.237   0.2160
ageold                 -5.1460     3.2698  -1.574   0.1155
educationuniversity    15.8299     6.6939   2.365   0.0180 *
educationpostgraduate  16.4206     6.4959   2.528   0.0115 *
residencemigrant        3.4734     2.4865   1.397   0.1624
residenceurbanite       2.5317     1.8349   1.380   0.1677
preceding_sounddorsal   5.7371     4.6734   1.228   0.2196
preceding_soundlabial  -1.8080     1.0883  -1.661   0.0966 .
following_sounddorsal  -1.2002     2.0071  -0.598   0.5499
following_soundlabial  -1.7458     0.9592  -1.820   0.0688 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
***************************************************************************
> dropterm(Redu.xallif.2, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - education
trying - residence
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ age + education + residence + preceding_sound +
             following_sound + (1 + education | item) + (1 | speaker)
                Df    AIC     LRT  Pr(Chi)
<none>             129.88
age              2 129.30  3.4221 0.180673
education        2 140.76 14.8879 0.000585 ***
residence        2 129.82  3.9412 0.139376
preceding_sound  2 132.75  6.8710 0.032209 *
following_sound  2 129.65  3.7735 0.151563
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
***************************************************************************
> Redu.xallif.3 <- update(Redu.xallif.2, . ~ . - age)
> summary(Redu.xallif.3)
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ education + residence + preceding_sound + following_
sound +
    (1 + education | item) + (1 | speaker)
Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
 nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
   129.3    176.7    -48.6     97.3      127

Scaled residuals:
     Min      1Q      Median    3Q       Max
-2.08521 -0.00362 -0.00019  0.19590  1.62749

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)           307.313  17.530
              educationuniversity   307.501  17.536   -1.00
              educationpostgraduate 307.343  17.531   -1.00  1.00
 speaker      (Intercept)             4.805   2.192
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -13.6663     6.8208  -2.004   0.0451 *
educationuniversity    14.6148     6.6958   2.183   0.0291 *
educationpostgraduate  16.1600     6.8655   2.354   0.0186 *
residencemigrant        0.8131     1.8706   0.435   0.6638
residenceurbanite       3.5587     2.0757   1.714   0.0864 .
preceding_sounddorsal   3.6222     3.4819   1.040   0.2982
preceding_soundlabial  -1.8096     1.0884  -1.663   0.0964 .
following_sounddorsal  -0.8809     2.0534  -0.429   0.6679
following_soundlabial  -1.6848     0.9640  -1.748   0.0805 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.xallif.3, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - education
trying - residence
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ education + residence + preceding_sound + following_sound +
            (1 + education | item) + (1 | speaker)
                Df    AIC     LRT   Pr(Chi)
<none>             129.30
education        2 151.87 26.5736 1.697e-06 ***
residence        2 129.43  4.1339   0.12657
preceding_sound  2 130.71  5.4058   0.06701 .
following_sound  2 128.72  3.4175   0.18109
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.xallif.4 <- update(Redu.xallif.3, . ~ . - following_sound)
> summary(Redu.xallif.4)
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ education + residence + preceding_sound + (1 +  educ
ation | item) + (1 | speaker)
Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
   128.7    170.2    -50.4    100.7      129

Scaled residuals:
   Min       1Q      Median   3Q      Max
-2.07362 -0.00385 -0.00023  0.23663  1.66545

Random effects:
 Groups       Name                   Variance Std.Dev. Corr
 item        (Intercept)           280.924  16.761
              educationuniversity   279.108  16.707   -1.00
              educationpostgraduate 277.557  16.660   -1.00  1.00
 speaker      (Intercept)             4.979   2.231
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -14.9889     7.6515  -1.959   0.0501 .
educationuniversity    14.9419     7.5423   1.981   0.0476 *
educationpostgraduate  16.7665     7.7522   2.163   0.0306 *
residencemigrant        0.4656     1.8826   0.247   0.8047
residenceurbanite       3.3022     2.1055   1.568   0.1168
preceding_sounddorsal   3.9524     3.2344   1.222   0.2217
preceding_soundlabial  -0.7559     0.8912  -0.848   0.3963
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.xallif.4, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - education
trying - residence
trying - preceding_sound
Single term deletions

Model:
convergence ~ education + residence + preceding_sound + (1 +  education | i
tem) + (1 | speaker)
                Df    AIC     LRT   Pr(Chi)
<none>             128.72
education        2 155.98 31.2653 1.625e-07 ***
residence        2 128.36  3.6439    0.1617
preceding_sound  2 128.95  4.2368    0.1202
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.xallif.5 <- update(Redu.xallif.4, . ~ . - residence)
> summary(Redu.xallif.5)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ education + preceding_sound + (1 + education |
    item) + (1 | speaker)
```

```
Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
   128.4    163.9    -52.2    104.4      131

Scaled residuals:
   Min      1Q       Median   3Q      Max
-2.22017 -0.00608 -0.00114  0.27585  1.60171

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)           341.99   18.493
              educationuniversity   341.75   18.487   -1.00
              educationpostgraduate 341.10   18.469   -1.00  1.00
 speaker      (Intercept)             5.16    2.272
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -13.0898     5.9626  -2.195   0.0281 *
educationuniversity    13.7806     5.9649   2.310   0.0209 *
educationpostgraduate  15.9589     6.2879   2.538   0.0111 *
preceding_sounddorsal   4.0250     3.3371   1.206   0.2278
preceding_soundlabial  -0.4586     0.8445  -0.543   0.5871
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.xallif.5, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - education
trying - preceding_sound
Single term deletions

Model:
convergence ~ education + preceding_sound + (1 + education | item) + (1 | s
peaker)
                Df    AIC     LRT   Pr(Chi)
<none>             128.36
education        2 153.39 29.0302 4.968e-07 ***
preceding_sound  2 128.47  4.1043    0.1285
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.xallif.6 <- update(Redu.xallif.5, . ~ . - preceding_sound)
> summary(Redu.xallif.6)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ education + (1 + education | item) + (1 |      speak
er)
   Data: xallif
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 2e+05),
      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
   128.5    158.1    -54.2    108.5      133

Scaled residuals:
   Min      1Q       Median   3Q      Max
```

```
-2.70987 -0.00697 -0.00284  0.26542  1.59134

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)           187.906  13.708
              educationuniversity   185.917  13.635   -1.00
              educationpostgraduate 184.540  13.585   -1.00  1.00
 speaker      (Intercept)             6.253   2.501
Number of obs: 143, groups:  item, 114; speaker, 30

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -10.161      3.901  -2.605  0.00919 **
educationuniversity     11.115      3.981   2.792  0.00524 **
educationpostgraduate   13.720      4.528   3.030  0.00245 **
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> anova(Max.xallif.12, Redu.xallif.6)
Data: xallif
Models:
Redu.xallif.6: convergence ~ education + (1 + education | item) + (1 | spea
ker)
Max.xallif.12: convergence ~ age * gender + education + residence + precedi
ng_sound
             + following_sound + (1 + education | item) + (1 | speaker)
               Df   AIC   BIC  logLik   deviance  Chisq Chi Df Pr(>Chisq)
Redu.xallif.6  10 128.47 158.09 -54.233  108.465
Max.xallif.12  21 134.72 196.94 -46.358  92.717    15.748     11     0.1507
***************************************************************************
> probs = 1/(1+exp(-fitted(Max.xallif.12)))
> somers2(probs, as.numeric(xallif$convergence)-1)
         C         Dxy           n     Missing
  0.9720266   0.9440532 143.0000000   0.0000000
> probs = 1/(1+exp(-fitted(Redu.xallif.6)))
> somers2(probs, as.numeric(xallif$convergence)-1)
         C         Dxy           n     Missing
  0.9778951   0.9557903 143.0000000   0.0000000
```

2.3 The (WaSSaL) dataset

```
> m0.null.wassal  <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
wassal, family = "binomial")
> summary(m0.null.wassal)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ 1 + (1 | speaker) + (1 | item)
   Data: wassal

     AIC      BIC   logLik deviance df.resid
    83.8     92.4    -38.9     77.8      126

Scaled residuals:
      Min        1Q    Median        3Q       Max
-0.198632 -0.000091  0.048387  0.064890  0.115501

Random effects:
 Groups          Name    Variance Std.Dev.
 item         (Intercept) 1740.8   41.72
 speaker      (Intercept)  100.6   10.03
```

```
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)  -12.287      3.454  -3.557 0.000375 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
*****************************************************************************
> Max.wassal.1 <- glmer (convergence ~ age + gender + education + residence
+ age:education + age:residence + gender:education + gender:residence +
education:residence + style + preceding_sound + following_sound + (1 +
style + preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence + style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.2 <- glmer (convergence ~ age + gender + education + residence
+ age:residence + gender:education + gender:residence + education:residence
+ style + preceding_sound + following_sound + (1 + style + preceding_sound
+ following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.3 <- glmer (convergence ~ age + gender + education + residence
+ gender:education + gender:residence + education:residence + style +
preceding_sound + following_sound + (1 + style + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.4 <- glmer (convergence ~ age + gender + education + residence
+  gender:residence + education:residence + style + preceding_sound +
following_sound + (1 + style + preceding_sound + following_sound | speaker)
+ (1 + age + gender + education + residence + style| item), data = wassal,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.wassal.5 <- glmer (convergence ~ age + gender + education + residence
+  education:residence + style + preceding_sound + following_sound + (1 +
style + preceding_sound + following_sound | speaker) + (1 + age + gender +
education + residence + style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.6 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + preceding_sound +
following_sound | speaker) + (1 + age + gender + education + residence +
style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.7 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 + following_sound |
speaker) + (1 + age + gender + education + residence + style| item), data =
```

```
wassal, family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.wassal.8 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 + age +
gender + education + residence + style| item), data = wassal,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.wassal.9 <- glmer (convergence ~ age + gender + education + residence
+ style + preceding_sound + following_sound + (1 | speaker) + (1 + gender +
education + residence + style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.10 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ education + residence + style| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
> Max.wassal.11 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ education + residence| item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.12 <- glmer (convergence ~ age + gender + education +
residence + style + preceding_sound + following_sound + (1 | speaker) + (1
+ education | item), data = wassal, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.wassal.13 <- glmer (convergence ~ age + gender + education + residenc
e + style + preceding_sound + following_sound + (1|item) + (1| speaker), da
ta=wassal, family='binomial', control=glmerControl(optimizer=c("bobyqa"), o
ptCtrl=list(maxfun=2e5), nAGQ = 1))

> summary(Max.wassal.13)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + style +
         preceding_sound + following_sound + (1 | item) +  (1 | speaker)
Data: wassal
Control:
glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+05), nAGQ
= 1)

     AIC      BIC   logLik deviance df.resid
    73.4    116.3    -21.7     43.4      114

Scaled residuals:
     Min        1Q    Median       3Q       Max
-0.051929 -0.000061  0.000000  0.000041  0.052869

Random effects:
 Groups           Name     Variance Std.Dev.
 Item         (Intercept)  13636    116.77
 speaker       (Intercept)  5133     71.64
```

```
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)            -2.6153     7.2656  -0.731   0.4650
agemiddle-aged         -3.2698     7.7194  -4.051 5.10e-05 ***
ageold                  2.7358     3.2263   0.057   0.9543
gendermale             -3.4312     9.0846  -4.230 2.33e-05 ***
educationuniversity     4.3353     9.6008   2.058   0.0396 *
educationpostgraduate   1.0950     5.5337   0.768   0.4427
residencemigrant        3.0392     7.5781   1.012   0.3114
residenceurbanite      -4.1516     6.4925  -0.639   0.5225
stylecasual             1.5696     9.3679   1.662   0.0965 .
preceding_sounddorsal   2.0815     6.9872   1.157   0.2474
preceding_soundlabial   7.9725     5.5080   4.577 1.73e-06 ***
following_sounddorsal  -4.0359     8.6326  -4.048 2.18e-05 ***
following_soundlabial   0.3037     8.6890   0.035   0.9721
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Max.wassal.13, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - gender
trying - education
trying - residence
trying - style
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ age + gender + education + residence + style +
             preceding_sound + following_sound + (1 | item) + (1 | speaker)
                Df    AIC    LRT Pr(Chi)
<none>             73.370
age              2 74.720 5.3501 0.06890 .
gender           1 77.572 6.2016 0.01276 *
education        2 74.969 5.5993 0.06083 .
residence        2 74.855 5.4849 0.06441 .
style            1 71.936 0.5662 0.45176
preceding_sound  2 71.671 2.3012 0.31644
following_sound  2 75.038 5.6682 0.05877 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.wassal.1 <- update(Max.wassal.13, . ~ . - style)
> summary(Redu.wassal.1)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + preceding_sou
nd +
         following_sound + (1 | item) + (1 | speaker)
   Data: wassal
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
    71.9    112.0    -22.0     43.9      115
```

```
Scaled residuals:
      Min       1Q    Median       3Q       Max
-0.072089 -0.000792  0.000000  0.000840  0.069867

Random effects:
 Groups          Name      Variance Std.Dev.
 item          (Intercept) 9029     95.02
 speaker       (Intercept) 2356     48.53
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -10.4692    2.2686  -0.492 0.622552
agemiddle-aged        -8.4299     6.5826  -2.800 0.005114 **
ageold                 2.7887     12.7878   0.122 0.902546
gendermale            -4.7574     6.5873  -3.151 0.001626 **
educationuniversity    4.7511     2.7629   1.963 0.049683 *
educationpostgraduate  4.4590     3.1948   1.309 0.190463
residencemigrant       1.8562     7.2001   0.261 0.794417
residenceurbanite     -6.2464     7.1786  -2.263 0.023624 *
preceding_sounddorsal   2.7383    5.3950   0.508 0.611758
preceding_soundlabial   6.5017    2.9535   4.825  1.4e-06 ***
following_sounddorsal  -5.5197    9.2191  -3.853 0.000117 ***
following_soundlabial  -0.4385    5.3501  -0.082 0.934684
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.wassal.1, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - gender
trying - education
trying - residence
trying - preceding_sound
trying - following_sound
Single term deletions

Model:
convergence ~ age + gender + education + residence + preceding_sound +
            following_sound + (1 | item) + (1 | speaker)
                Df    AIC    LRT Pr(Chi)
<none>             71.936
age              2 72.767 4.8308 0.08933 .
gender           1 75.214 5.2777 0.02160 *
education        2 71.989 4.0529 0.13180
residence        2 71.172 3.2362 0.19828
preceding_sound  2 69.725 1.7892 0.40877
following_sound  2 72.936 5.0002 0.08208 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.wassal.2 <- update(Redu.wassal.1, . ~ . - preceding_sound)
> summary(Redu.wassal.2)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + following_sou
nd +
         (1 | item) + (1 | speaker)
```

```
Data: wassal
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5), nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
    69.7    104.0    -22.9     45.7      117

Scaled residuals:
     Min        1Q    Median        3Q       Max
-0.057284 -0.000638  0.000001  0.000151  0.066656

Random effects:
 Groups          Name     Variance Std.Dev.
 item          (Intercept) 13926    118.01
 speaker      (Intercept)  3823     61.83
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           -3.5812     9.6678  -1.199 0.230536
agemiddle-aged        -5.7355     6.6964  -3.843 0.000121 ***
ageold                  5.8241     8.5443   0.113 0.910016
gendermale             -4.6208     6.7729  -3.635 0.000278 ***
educationuniversity     6.2661     8.4248   3.325 0.000884 ***
educationpostgraduate   7.6348     3.8878   2.831 0.004635 **
residencemigrant        5.4126     5.1182   0.724 0.469292
residenceurbanite      -2.6898     8.0825  -2.807 0.004996 **
following_sounddorsal  -4.9077     9.5360  -4.290 1.79e-05 ***
following_soundlabial  -0.7127     5.5373  -0.129 0.897585
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.wassal.2, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - gender
trying - education
trying - residence
trying - following_sound
Single term deletions

Model:
convergence ~ age + gender + education + residence + following_sound +
              (1 | item) + (1 | speaker)
                Df    AIC    LRT Pr(Chi)
<none>             69.725
age              2 72.391 6.6651 0.03570 *
gender           1 71.679 3.9535 0.04677 *
education        2 71.528 5.8021 0.05496 .
residence        2 71.992 6.2665 0.04357 *
following_sound  2 69.887 4.1618 0.12482
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.wassal.3 <- update(Redu.wassal.2, . ~ . - following_sound)
> summary(Redu.wassal.3)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
Family: binomial  ( logit )
```

```
Formula: convergence ~ age + gender + residence + education + (1|item + (1|
speaker)
Data: wassal
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5), nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
    69.9     98.5    -24.9     49.9      119

Scaled residuals:
    Min       1Q      Median      3Q       Max
-0.066084 -0.001202  0.000016  0.000791  0.080304

Random effects:
 Groups          Name   Variance Std.Dev.
 item         (Intercept) 6910     83.12
 speaker      (Intercept) 2219     47.10
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
                      Estimate   Std. Error z value Pr(>|z|)
(Intercept)            -10.784     21.213  -0.508  0.61119
agemiddle-aged         -3.215      5.674   -4.091 4.29e-05 ***
ageold                  6.315     14.889   0.048  0.96197
gendermale             -12.17       5.824   -3.807  0.00014 ***
residencemigrant        8.084       15.736   1.149  0.25050
residenceurbanite      -9.378       7.285   -2.660  0.00782 **
educationuniversity     5.041       2.832    2.162  0.03061 *
educationpostgraduate   5.119       2.465    2.008  0.04460 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
****************************************************************************
> dropterm(Redu.wassal.3, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)

trying - age
trying - gender
trying - residence
trying - education
Single term deletions

Model:
convergence ~ age + gender + residence + education + (1 |item) + (1| speake
r)
          Df    AIC    LRT Pr(Chi)
<none>       69.887
age        2 71.822 5.9343 0.05145 .
gender     1 72.321 4.4335 0.03524 *
residence  2 71.584 5.6965 0.05795 .
education  2 70.756 4.8685 0.08766 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
****************************************************************************
> Redu.wassal.4 <- update(Redu.wassal.3, . ~ . - education)
> summary(Redu.wassal.4)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + residence + (1 | item) + (1 | speake
r)
```

```
Data: wassal
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5), nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
    70.8     93.6    -27.4     54.8      121

Scaled residuals:
     Min       1Q    Median       3Q      Max
-0.068664 -0.001592  0.000036  0.001230  0.081770

Random effects:
 Groups         Name     Variance Std.Dev.
 item          (Intercept) 6297     79.35
 speaker       (Intercept) 2467     49.67
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
                  Estimate Std. Error z value Pr(>|z|)
(Intercept)         5.768      8.145   4.392 1.13e-05 ***
agemiddle-aged     -5.828      7.795  -3.313 0.000922 ***
ageold              2.092      10.137  0.002 0.998447
gendermale         -2.400      6.410  -3.494 0.000475 ***
residencemigrant    1.926      8.903   2.238 0.025219 *
residenceurbanite  -2.600      8.213  -2.752 0.005926 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.wassal.4, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - gender
trying - residence
Single term deletions

Model:
convergence ~ age + gender + residence + (1 | item) + (1 | speaker)
          Df    AIC     LRT  Pr(Chi)
<none>       70.756
age        2 77.131 10.3748 0.005586 **
gender     1 71.651  2.8949 0.088861 .
residence  2 77.161 10.4055 0.005501 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.wassal.5 <- update(Redu.wassal.4, . ~ . - gender)
> summary(Redu.wassal.5)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) [
glmerMod]
 Family: binomial  ( logit )
Formula: convergence ~ age + residence + (1 | item) + (1 | speaker)
Data: wassal
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),
    nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
    71.7     91.7    -28.8     57.7      122

Scaled residuals:
```

```
    Min        1Q    Median        3Q       Max
-0.100572 -0.000921  0.000010  0.000488  0.093951

Random effects:
 Groups          Name      Variance Std.Dev.
 item           (Intercept) 8577.6   92.62
 speaker        (Intercept)  999.8   31.62
Number of obs: 129, groups:  item, 49; speaker, 22

Fixed effects:
                    Estimate Std. Error z value Pr(>|z|)
(Intercept)           17.800     5.109   3.484 0.000494 ***
agemiddle-aged        -5.760     9.558  -3.741 0.000183 ***
ageold                 2.054     4.349   0.382 0.702486
residencemigrant       4.267     8.592   2.592 0.009556 **
residenceurbanite     -2.391     6.737  -0.355 0.722677
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> anova(Max.wassal.13, Redu.wassal.5)
Data: wassal
Models:
Redu.wassal.5: convergence ~ age + residence + (1 | item) + (1 | speaker)
Max.wassal.13:  convergence ~ age + gender + education + residence + style
          + preceding_sound + following_sound + (1 | item) +  (1 | speaker)
                  Df   AIC   BIC     logLik deviance  Chisq Chi Df Pr(>Chisq)

Redu.wassal.5   7   71.651  91.669 -28.825   57.651
Max.wassal.13   15  73.370  116.267 -21.685  43.370    14.281    8    0.07474 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> probs = 1/(1+exp(-fitted(Max.wassal.13)))
> somers2(probs, as.numeric(wassal$convergence)-1)
      C         Dxy           n     Missing

   0.8652310   0.7728411 129.0000000   0.0000000

> probs = 1/(1+exp(-fitted(Redu.wassal.5)))
> somers2(probs, as.numeric(wassal$convergence)-1)
      C           Dxy          n            Missing
   0.8832420   0.8126235 129.0000000   0.0000000

***************************************************************************
```

3. The (stress) Dataset

```
> m0.null.stress  <- glmer(convergence ~ 1 + (1|speaker)+ (1|item), data =
stress, family = "binomial")
> summary(m0.null.stress)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ 1 + (1 | speaker) + (1 | item)
   Data: stress

     AIC      BIC    logLik deviance df.resid
  1067.1   1084.9   -530.5   1061.1     2813

Scaled residuals:
     Min       1Q   Median       3Q      Max
-1.99311 -0.02558  0.00725  0.03497  2.28684
```

```
Random effects:
 Groups  Name        Variance Std.Dev.
 item    (Intercept) 31.53    5.615
 speaker (Intercept) 99.90    9.995
Number of obs: 2816, groups:  item, 999; speaker, 63

Fixed effects:
            Estimate Std. Error z value Pr(>|z|)
(Intercept)    7.792      1.237   6.297 3.03e-10 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
**********************************************************************
> Max.stress.1 <- glmer (convergence ~ age + gender + education + residence
+ age:education + age:residence + gender:education + gender:residence +
education:residence + style + (1 + style + | speaker) + (1 + age + gender +
education + residence + style| item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.2 <- glmer (convergence ~ age + gender + education + residence
+ + age:residence + gender:education + gender:residence +
education:residence + style + (1 + style + | speaker) + (1 + age + gender +
education + residence + style| item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.3 <- glmer (convergence ~ age + gender + education + residence
+ + gender:education + gender:residence + education:residence + style + (1
+ style + | speaker) + (1 + age + gender + education + residence + style|
item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.4 <- glmer (convergence ~ age + gender + education + residence
+ gender:residence + education:residence + style + (1 + style + | speaker)
+ (1 + age + gender + education + residence + style| item), data = stress,
family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.stress.5 <- glmer (convergence ~ age + gender + education + residence
+ education:residence + style + (1 + style + | speaker) + (1 + age + gender
+ education + residence + style| item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.6 <- glmer (convergence ~ age + gender + education + residence
+ style + (1 + style + | speaker) + (1 + age + gender + education +
residence + style| item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.7 <- glmer (convergence ~ age + gender + education + residence
+ style + (1 + style + | speaker) + (1 + gender + education + residence +
style| item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))
```

```
> Max.stress.8 <- glmer (convergence ~ age + gender + education + residence
+ style + (1 + style + | speaker) + (1 + education + residence + style|
item), data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.9 <- glmer (convergence ~ age + gender + education + residence
+ style + (1 + style + | speaker) + (1 + education + residence + | item),
data = stress, family='binomial',
control=glmerControl(optimizer=c("bobyqa"), optCtrl=list(maxfun=2e5), nAGQ
= 1))

> Max.stress.9 <- glmer (convergence ~ age + gender + education + residence
+ style + (1 + style + | speaker) + (1 + education + | item), data =
stress, family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.stress.10 <- glmer (convergence ~ age*gender + education + residence
+ style + (1 + style + | speaker) + (1 + education + | item), data =
stress, family='binomial', control=glmerControl(optimizer=c("bobyqa"),
optCtrl=list(maxfun=2e5), nAGQ = 1))

> Max.stress.11 <- glmer (convergence ~ age + gender + education + residenc
e + age:gender + education: residence +  style + (1 + style  | speaker)+ (1
 + education |item), data = stress,family='binomial', control=glmerControl
(optimizer=c("bobyqa"),optCtrl=list(maxfun=2e5), nAGQ = 1))

> summary(Max.stress.11)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + age:gender +
        education:residence + style +(1+ style| speaker) + (1+ education |
        item)
Data: stress
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5), nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1450.2   1592.8   -701.1   1402.2     2792

Scaled residuals:
    Min      1Q  Median      3Q     Max
-5.1108 -0.0509  0.0234  0.1162  4.2779

Random effects:
 Groups       Name                   Variance Std.Dev. Corr
 item (Intercept)            5.292   2.301
             educationuniversity    1.609   1.268    -0.93
             educationpostgraduate 30.832   5.553    -0.57  0.70
 speaker      (Intercept)           27.112   5.207
             stylecasual            6.005   2.451    -0.74
Number of obs: 2816, groups:  item, 999; speaker, 62

Fixed effects:
                                    Estimate Std. Error z value Pr(>|z|)
(Intercept)                          -2.4097     2.4549  -0.982 0.326300
agemiddle-aged                       -2.0853     2.2002  -0.948 0.343255
ageold                                1.9343     3.8785   0.499 0.617969
gendermale                           -0.3872     1.5149  -0.256 0.798249
```

```
educationuniversity                        6.8160     2.3134   2.946 0.003216 **
educationpostgraduate                     16.1903     3.5168   4.604 4.15e-06 ***
residencemigrant                           2.8957     4.2690   0.678 0.497573
residenceurbanite                          6.3845     2.5454   2.508 0.012133 *
stylecasual                               -2.8563     0.7970  -3.584 0.000339 ***
agemiddle-aged:gendermale                  1.5786     2.7629   0.571 0.567761
ageold:gendermale                         -4.3892     4.2289  -1.038 0.299308
educationuniversity:residencemigrant       3.3687     5.4520   0.618 0.536655
educationpostgraduate:residencemigrant    -7.9740     5.2733  -1.512 0.130500
educationuniversity:residenceurbanite     -1.6863     3.0829  -0.547 0.584377
educationpostgraduate:residenceurbanite   -5.9344     4.0738  -1.457 0.145185
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Max.stress.11, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - style
trying - age:gender
trying - education:residence
Single term deletions

Model:
convergence ~ age + gender + education + residence + age:gender +
    education:residence + style + (1 + style | speaker) + (1 +
    education | item)
                    Df    AIC     LRT   Pr(Chi)
<none>                 1450.2
style                1 1465.3 17.1111 3.526e-05 ***
age:gender           2 1448.0  1.7668    0.4134
education:residence  4 1449.0  6.7866    0.1476
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.stress.1 <-update(Max.stress.11, .~.- age:gender)
> summary(Redu.stress.1)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ age + gender + education + residence + style +
    (1 + style | speaker) + (1 + education | item) +      education:residen
ce
   Data: stress
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1448.0   1578.7   -702.0   1404.0     2794

Scaled residuals:
    Min      1Q  Median      3Q     Max
-5.1368 -0.0444  0.0237  0.1170  4.2938

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item (Intercept)            5.082   2.254
             educationuniversity    1.507   1.228    -0.93
             educationpostgraduate 31.013   5.569    -0.57  0.71
 speaker      (Intercept)           26.477   5.146
             stylecasual            5.748   2.397    -0.71
Number of obs: 2816, groups:  item, 999; speaker, 62

Fixed effects:
```

```
                                       Estimate Std. Error z value Pr(>|z|)
(Intercept)                             -1.8493     2.4442  -0.757 0.449285
agemiddle-aged                          -1.0533     1.3711  -0.768 0.442364
ageold                                  -1.3909     1.9830  -0.701 0.483048
gendermale                              -0.4513     1.1949  -0.378 0.705679
educationuniversity                      6.2356     2.3735   2.627 0.008608 **
educationpostgraduate                   15.4417     3.6662   4.212 2.53e-05 ***
residencemigrant                         2.3593     4.3887   0.538 0.590859
residenceurbanite                        5.2961     2.5392   2.086 0.036999 *
stylecasual                             -2.7996     0.7934  -3.529 0.000417 ***
educationuniversity:residencemigrant     4.4116     5.5243   0.799 0.424529
educationpostgraduate:residencemigrant  -6.9389     5.3473  -1.298 0.194409
educationuniversity:residenceurbanite   -0.4102     3.0560  -0.134 0.893213
educationpostgraduate:residenceurbanite -4.6875     4.0660  -1.153 0.248977
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.stress.1, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - gender
trying - style
trying - education:residence
Single term deletions

Model:
convergence ~ age + gender + education + residence + style +
    (1 + style | speaker) + (1 + education | item) +
    education:residence
                    Df    AIC     LRT   Pr(Chi)
<none>                 1448.0
age                  2 1444.8  0.7915    0.6732
gender               1 1446.1  0.1422    0.7061
style                1 1461.8 15.8951 6.695e-05 ***
education:residence  4 1446.2  6.2294    0.1827
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.stress.2 <-update(Redu.stress.1, .~.- gender)
> summary(Redu.stress.2)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ age + education + residence + style + (1 + style | s
peaker) + (1 + education | item) + education:residence
Data: stress
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1446.1   1570.9   -702.0   1404.1     2795

Scaled residuals:
    Min      1Q  Median      3Q     Max
-5.1188 -0.0390  0.0229  0.1173  4.2657

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item         (Intercept)            5.082   2.254
              educationuniversity    1.503   1.226    -0.93
              educationpostgraduate 31.783   5.638    -0.56  0.70
 speaker      (Intercept)           27.167   5.212
```

```
                stylecasual             5.813   2.411    -0.72
Number of obs: 2816, groups:  item, 999; speaker, 62

Fixed effects:
                                       Estimate Std. Error z value Pr(>|z|)
(Intercept)                             -2.1762     2.2943  -0.948 0.342878
agemiddle-aged                          -1.1383     1.3610  -0.836 0.402961
ageold                                  -1.5922     1.9088  -0.834 0.404204
educationuniversity                      6.3718     2.3486   2.713 0.006667 **
educationpostgraduate                   15.6457     3.5949   4.352 1.35e-05 ***
residencemigrant                         2.2778     4.3841   0.520 0.603364
residenceurbanite                        5.5786     2.4284   2.297 0.021605 *
stylecasual                             -2.8276     0.7952  -3.556 0.000377 ***
educationuniversity:residencemigrant     4.4367     5.5189   0.804 0.421455
educationpostgraduate:residencemigrant  -6.9198     5.3269  -1.299 0.193938
educationuniversity:residenceurbanite   -0.6011     3.0200  -0.199 0.842241
educationpostgraduate:residenceurbanite -4.8622     3.9882  -1.219 0.222792
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.stress.2, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - age
trying - style
trying - education:residence
Single term deletions

Model:
convergence ~ age + education + residence + style + (1 + style |
    speaker) + (1 + education | item) + education:residence
                    Df    AIC     LRT   Pr(Chi)
<none>                 1446.1
age                  2 1443.1  1.0349    0.5960
style                1 1460.2 16.0702 6.104e-05 ***
education:residence  4 1444.3  6.1652    0.1871
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.stress.3 <-update(Redu.stress.2, .~.- age)
> summary(Redu.stress.3)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
 Family: binomial  ( logit )
Formula: convergence ~ education + residence + style + (1 + style | speake
r) + (1 + education | item) + education:residence
Data: stress
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5),      nAGQ = 1)

     AIC      BIC   logLik deviance df.resid
  1443.1   1556.1   -702.6   1405.1     2797

Scaled residuals:
    Min      1Q    Median      3Q     Max
-5.1044 -0.0452  0.0234  0.1190  4.3331

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)            5.008    2.238
              educationuniversity    1.497   1.223    -0.92
              educationpostgraduate 28.479   5.337    -0.59  0.73
 speaker      (Intercept)           26.987   5.195
```

```
              stylecasual            5.785   2.405    -0.72
Number of obs: 2816, groups:  item, 999; speaker, 62

Fixed effects:
                                        Estimate Std. Error z value Pr(>|z|)
(Intercept)                              -3.1106     2.1430  -1.452 0.146631
educationuniversity                       6.8998     2.3152   2.980 0.002880 **
educationpostgraduate                    15.6251     3.5815   4.363 1.28e-05 ***
residencemigrant                          3.2207     4.3226   0.745 0.456225
residenceurbanite                         5.4382     2.4209   2.246 0.024684 *
stylecasual                              -2.8261     0.8044  -3.513 0.000443 ***
educationuniversity:residencemigrant      2.7436     5.2444   0.523 0.600868
educationpostgraduate:residencemigrant   -7.6259     5.3381  -1.429 0.153120
educationuniversity:residenceurbanite    -0.2304     2.9928  -0.077 0.938637
educationpostgraduate:residenceurbanite  -4.4243     3.9528  -1.119 0.263023
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> dropterm(Redu.stress.3, scale = 0, test ="Chisq", k = 2, sorted = FALSE,
trace = TRUE)
trying - style
trying - education:residence
Single term deletions

Model:
convergence ~ education + residence + style + (1 + style | speaker) + (1 +
education | item) + education:residence
                    Df    AIC     LRT   Pr(Chi)
<none>                 1443.1
style                1 1457.0 15.8953 6.694e-05 ***
education:residence  4 1440.9  5.8011    0.2145
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
***************************************************************************
> Redu.stress.4 <-update(Redu.stress.3, .~.- education:residence)
> summary(Redu.stress.4)
Generalized linear mixed model fit by maximum likelihood (Laplace Approxima
tion) ['glmerMod']
Family: binomial  ( logit )
Formula: convergence ~ education + residence + style + (1 + style | speake
r) + (1 + education | item)
Data: stress
Control: glmerControl(optimizer = c("bobyqa"), optCtrl = list(maxfun = 2e+0
5), nAGQ = 1)

    AIC      BIC   logLik deviance df.resid
  1440.9   1530.1   -705.5   1410.9     2801

Scaled residuals:
    Min      1Q  Median      3Q     Max
-5.0852 -0.0494  0.0256  0.1231  4.2806

Random effects:
 Groups       Name                  Variance Std.Dev. Corr
 item        (Intercept)            4.886   2.210
              educationuniversity    1.509   1.228    -0.91
              educationpostgraduate 26.062   5.105    -0.62  0.76
 speaker      (Intercept)           22.498   4.743
              stylecasual            5.089   2.256    -0.55
Number of obs: 2816, groups:  item, 999; speaker, 62
Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
```

```
(Intercept)            -2.7471     1.5805  -1.738 0.082196 .
educationuniversity     6.6984     1.5416   4.345 1.39e-05 ***
educationpostgraduate  12.1388     2.7572   4.403 1.07e-05 ***
residencemigrant        0.5003     1.9932   0.251 0.801820
residenceurbanite       4.7570     1.3602   3.497 0.000470 ***
stylecasual            -2.4861     0.7456  -3.334 0.000856 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
*****************************************************************************
> anova(Max.stress.11, Redu.stress.4)
Data: stress
Models:
Max.stress.5: convergence ~ education + residence + style + (1 + style | speake
r) +
Max.stress.5:     (1 + education | item)
Max.stress.1: convergence ~ age + gender + education + residence + age:gender +

Max.stress.1:     education:residence + style + (1 + style | speaker) + (1 +
Max.stress.1:     education | item)
             Df    AIC    BIC  logLik deviance  Chisq Chi Df Pr(>Chisq)
Max.stress.5 15 1440.9 1530.1 -705.47   1410.9
Max.stress.1 24 1450.2 1592.8 -701.09   1402.2 8.7451      9     0.4611
*****************************************************************************
> probs = 1/(1+exp(-fitted(Max.stress.11)))
> somers2(probs, as.numeric(stress$convergence)-1)
      C           Dxy          n             Missing
   0.9559471    0.9418942   2779.0000000    0.0000000
> probs = 1/(1+exp(-fitted(Redu.stress.4)))
> somers2(probs, as.numeric(stress$convergence)-1)
      C           Dxy          n             Missing
   0.9857456    0.9714912   2779.0000000    0.0000000
```

Appendix 5: Online Questionnaire

التقارب بين اللهجات المصرية :تأثير لهجة القاهرة على لهجة المنيا

مقدمة

يقوم الباحث سعودي صادق محمد محمد، طالب الدكتوراه بقسم اللغ واللغويات بجامعة يورك بالمملكة المتحدة، بإشراف الأستاذ الدكتور بول كيرزوِل، أستاذ علم اللغة الاجتماعي بالقسم، والدكتورة سام هيلمَث، أستاذ مساعد علم الأصوات بالقسم، يقوم بإجراء دراسة عنوانها التقارب بين اللهجات في مصر :تأثير لهجة القاهرة على لهجة المنيا .تتناول الدراسة أوجة التقارب بين اللهجات في مصر بشكل عام وكيف ينعكس ذلك على التغير الحادث في لهجة المنيا تأثراً بلهجة القاهرة بشكل خاص، من خلال التركيز على الأصوات. وسواء أشاركت في هذا البحث من خلال السماح للباحث بأن يسجل لقاءً معك أم لا، فأنت مدعو هنا للمشاركة في هذه الاستبانة التي تهدف للتعرف إلى الأسباب التي قد تدفع متحدثي لهجة المنيا لاستعارة بعض الأصوات من اللهجة القاهرية أو للتحدث بلهجة قاهرية صرفة والتخلي عن لهجة المنيا .كما تهدف الاستبانة للبحث عن الكيفية التي يحدث من خلالها هذا التغير في لهجة المنيا، إن وُجد، والسمات اللغوية مثل الأصوات الأكثر عرضة للتغير. وللعلم، فإن

- المعلومات التي أسهمت بها سيحتفظ بها فريق البحث في سرية تامة .
- اسمك أو أية معلومات تُعرِّف بشخصك لن تُذكر في أية منشورات علمية .
- المعلومات التي أسهمت بها قد تُحفظ بعد انتهاء هذا المشروع البحثي بغرض الاستفادة منها في بحوث لغوية أخرى في المستقبل .

إذا كانت لديك أية أسئلة تخص الدراسة يُرجى التواصل مع الباحث على البريد الإليكتروني ss1272@york.ac.uk

لتعبئة هذه الاستبانة، يجب أن تكون من مواليد محافظة المنيا .

استمارة موافقة

يمكنك من خلال هذه الاستمارة إبداء موافقتك على المشاركة في هذه الاستبانة؛ ولذا؛ يُرجى قراءة كل الأسئلة وإجاباتها، وإذا لم تفهم شيئاً ما أو تود في معرفة المزيد من المعلومات فيرُجى الاستفسار من الباحث .قبل البدء في الاستبيان، الرجاء قراءة كتيب التعليمات أولاً على الرابط التالي .https://goo.gl/vqP فإذا وافقت على تعبئة هذه الاستبانة يجب أن تجيب بـ" نعم "على كل الأسئلة ما عدا السؤالين الأخيرين.

أ. هل قرأت وفهمت كتيب المعلومات الذي قُدم لك عن الدراسة؟

- ❍ نعم
- ❍ لا

ب. هل كانت لديك الفرصة لطرح أية أسئلة عن الاستبانة وهل تم الرد على هذه الأسئلة بشكل مرضٍ؟

- ❍ نعم

- ❍ لا

ج. هل تعلم أن المعلومات التي أسهمت بها سيحتفظ بها فريق البحث في سرية وأن اسمك أو أية معلومات تُعرِّف بشخصك لن تُذكر في أية منشورات علمية؟

- ❍ نعم
- ❍ لا

د. هل تعلم أنه من حقك الانسحاب من هذه الاستبانة في أي وقت قبل الانتهاء منها دون إبداء أية أسباب وأنه في هذه الحالة لن تُحفظ إجاباتك؟

- ❍ نعم
- ❍ لا

هـ. هل تعلم أن المعلومات التي أسهمت بها قد يتم الاحتفاظ بها بعد انتهاء هذا المشروع البحثي بغرض الاستفادة منها في بحوث لغوية أخرى في المستقبل؟

- ❍ نعم
- ❍ لا

و. هل توافق على المشاركة في هذه الاستبانة؟

- ❍ نعم

ز. هل توافق على استخدام مقتطفات من إجاباتك في عروض أو محاضرات يقدمها الباحث دون الإفصاح عن اسمك الحقيقي؟

- ❍ نعم
- ❍ لا

ح. هل توافق على احتفاظ الباحث ببيانات التواصل معك عقب انتهاء هذا المشروع حتى يمكنه التواصل معك مستقبلاً بشأن المشاركة في مشروعات بحثية أخرى؟

- ❍ نعم
- ❍ لا

معلومات شخصية عن المشاركين في الاستبانة

1. الاسم:

يمكنك عدم ذكر اسمك إذا أردت أو استخدام اسم مستعار كيفما تشاء.

2. النوع

- ذكر
- أنثى

3. الفئة العمرية

- 20-30
- 31-40
- 41-50
- 51-60
- 61-70
- 71-80
- +80

4. أين وُلدتَ؟

- وُلدتُ في مركز العدوة أو إحدى قراه
- وُلدتُ في مركز مغاغة أو إحدى قراه
- وُلدتُ في مركز بني مزارأو إحدى قراه
- وُلدتُ في مركز مطاي أو إحدى قراه
- وُلدتُ في مركز سمالوط أو إحدى قراه
- وُلدتُ في مدينة المنيا
- وُلدتُ في إحدى القرى التابعة لمدينة المنيا
- وُلدتُ في مدينة المنيا الجديدة
- وُلدتُ في مركز أبو قرقاص أو إحدى قراه
- وُلدتُ في مركز ملوي أو إحدى قراه
- وُلدتُ في مركز ديرمواس أو إحدى قراه

5. أين وُلدتَ وأين تعيش الآن؟

- وُلدتُ وأعيش في الريف
- وُلدتُ وأعيش في الحضر
- وُلدتُ في الريف ولكن أعيش الآن في الحضر

- ❍ وُلدتُ في الحضر ولكن أعيش الآن في الريف

6. ما أعلى مؤهل علمي حصلت عليه؟

- ❍ لم أحصل على أي مؤهل
- ❍ شهادة الابتدائية
- ❍ شهادة الإعدادية
- ❍ شهادة الثانوية العامة أو شهادة دبلوم فني أو سنوات أو ما يعادلهما
- ❍ شهادة فوق المتوسط مثل شهادة معهد فوق متوسط أو ما يعادلها
- ❍ شهادة جامعية مثل الليسانس أو البكالوريويس أو ما يعادلهما
- ❍ درجة الماجستير أو ما يعادلها
- ❍ درجة الدكتوراه أو ما يعادلها
- ❍ درجة أعلى من الدكتوراه أو ما يعادلها

7. ما هي المصادر التي تعرفت على اللهجة القاهرية من خلالها؟ يمكنك اختيار أكثر من إجابة أو جميع الإجابات .

- ❑ الاحتكاك المباشر بالقاهريين في القاهرة
- ❑ الاحتكاك المباشر بالقاهريين في المنيا
- ❑ الاحتكاك المباشر بالقاهريين في أي مكان آخر
- ❑ الإعلام الإذاعة، والتليفزيون، والسينما، والإنترنت

أتقييم المشاركين للسمات اللغوية في لهجتي القاهرة والمنيا

8. فيما يلي قائمة ببعض السمات اللغوية المميزة للهجة القاهرة .كيف ترى أو تقيم هذه السمات؟ تذكر– مشكوراً –أنه يمكنك اختيار أكثر من إجابة.

	يصلح للحضر أكثر	يصلح للرجال أكثر	يصلح للنساء أكثر	يصلح للمتعلمين أكثر	يصلح لغير المتعلمين أكثر	يصلح لكبار السن أكثر	يصلح لصغار السن أكثر
صوت القاف في كلمة قلب alb	☐	☐	☐	☐	☐	☐	☐
نبر الكلمة كما في كلمة مدرسة mad'rasa	☐	☐	☐	☐	☐	☐	☐
أصوات العلة في كلمة يتكلم yitkallim	☐	☐	☐	☐	☐	☐	☐
أصوات العلة في كلمة يخلف yikhallif	☐	☐	☐	☐	☐	☐	☐
أصوات العلة في كلمة بوصل yiwaSSal	☐	☐	☐	☐	☐	☐	☐
نبر الكلمة كما في كلمة مدرسة mad'rasa	☐	☐	☐	☐	☐	☐	☐

9. فيما يلي قائمة ببعض السمات اللغوية المميزة للهجة المنيا .كيف ترى أو تقيم هذه السمات ؟ تذكر– مشكوراً – أنه يمكنك اختيار أكثر من إجابة.

	يصلح للحضر أكثر	يصلح للرجال أكثر	يصلح للنساء أكثر	يصلح للمتعلمين أكثر	يصلح لغير المتعلمين أكثر	يصلح لكبار السن أكثر	يصلح لصغار السن أكثر
صوت القاف في كلمة قلب galb	☐	☐	☐	☐	☐	☐	☐
أصوات العلة في كلمة يتكلم yitkillim or yitkallam	☐	☐	☐	☐	☐	☐	☐
أصوات العلة في كلمة يخلف yikhallaf	☐	☐	☐	☐	☐	☐	☐
أصوات العلة في كلمة يوصل yiwaSSil	☐	☐	☐	☐	☐	☐	☐
نبر الكلمة كما في كلمة مدرسة madrasa'	☐	☐	☐	☐	☐	☐	☐

10. إذا ما افترضنا أن شخصاً ما من محافظة المنيا يحاول التحدث بلهجة القاهرة ، فما هي السمات اللغوية في لهجة المنيا التي من المحتمل أن يتخلى عنها ويستخدم ما يوازيها في اللهجة القاهرية؟ فيما يلي قائمة تلخص الفوارق اللغوية بين لهجتي القاهرة والمنيا كما هو واضح في السؤالين السابقين وأمام كل سمة خمسة اختيارات عن احتمالية استخدام السمة اللغوية القاهرية بديلاً عن السمة الموازية في لهجة المنيا .أول هذه الاختيارات' محتمل جداً 'ويعني أن هناك احتمالاً كبيراً للتخلي عن هذه السمة اللغوية في لهجة المنيا، وآخرها' غير محتمل على الإطلاق ' ويعني أن ترك هذه السمة اللغوية مستبعد .يرجى اختيار درجة الاحتمال وفقاً لما تراه مناسباً.

	محتمل	قد يكون محتملاً	غير محتمل
صوت القاف في كلمة قلب galb	○	○	○
أصوات العلة في كلمة يتكلم yitkillim or yitkallam	○	○	○
أصوات العلة في كلمة يخلف yikhallaf	○	○	○
أصوات العلة في كلمة يوصل yiwaSSil	○	○	○
نبر الكلمة كما في كلمة مدرسة madrasa‘	○	○	○

استخدام المشاركين في الاستبانة للهجة القاهرة

11. هل تستخدم أية سمات لغوية من اللهجة القاهرية مثل استخدام صوت الهمزة بدلاً من القاف المنياوية كقولك alb بدلاً من galb؟

○ نعم

○ لا

12. وهل تعتمد هذه النسبة على مدة مشاهدة أو الاستماع للإعلام التليفزيون، الإذاعة، السينما، أو أية وسيلة إعلامية أخرى؟ أي، هل

كلما طالت مشاهدتك أو استماعك للإعلام استخدمت اللهجة القاهرية أو أياً من سماتها أكثر؟

- ❍ نعم
- ❍ لا

توقعات المشاركين في الاستبانة لاستخدام لهجة القاهرة في المنيا

13. إذا علمت أن بعض المنياوية يحاولون التحدث بلهجة القاهرة، فما هي الفئات التي يُتوقَع أن تفعل ذلك؟ يمكنك اختيار أكثر من إجابة.

- ❑ الرجال
- ❑ النساء

14. إذا علمت أن بعض المنياوية يحاولون التحدث بلهجة القاهرة، فما هي الفئات التي يُتوقَع أن تفعل ذلك؟ يمكنك اختيار أكثر من إجابة.

- ❑ سكان المدن
- ❑ سكان الريف
- ❑ المهاجرون من الريف للمدن

15. إذا علمت أن بعض المنياوية يحاولون التحدث بلهجة القاهرة، فما هي الفئات التي يُتوقَع أن تفعل ذلك؟ يمكنك اختيار أكثر من إجابة.

- ❑ صغار السن
- ❑ متوسطو السن
- ❑ كبارالسن

16. إذا علمت أن بعض المنياوية يحاولون التحدث بلهجة القاهرة، فما هي الفئات التي يُتوقَع أن تفعل ذلك؟

- ❍ المتعلمون وغير المتعلمين
- ❍ المنعلمون فقط
- ❍ غير المتعلمين فقط

17. لو كانت الإجابة (المتعلمون وغير المتعلمين)، إذن فما هو توقعك لاستخدام اللهجة القاهرية؟

- ❍ يستخدمها المتعلمون أكثر من عير المتعلمين
- ❍ يستخدمها غير المتعلمين أكثر من المتعلمين

18. ولو كانت الإجابة (المتعلمون فقط)، إذن فما هو توقعك لاستخدام اللهجة القاهرية؟

- ❍ كلما ارتفع مستوى التعليم ارتفع استخدام اللهجة القاهرية في المنيا
- ❍ كلما ارتفع مستوى التعليم انخفض استخدام اللهجة القاهرية في المنيا

19. إذا علمت أن بعض المنياوية يحاولون التحدث بلهجة القاهرة، فما هي الفئات التي يُتوقَع أن تفعل ذلك؟ يمكنك اختيار أكثر من إجابة.

- ❑ العزب
- ❑ العزباوات
- ❑ الخطباء
- ❑ المخطوبات
- ❑ المتزوجون
- ❑ المتزوجات
- ❑ المطلقون
- ❑ المطلقات
- ❑ الأرملة
- ❑ الآرامل

20. إذا علمت أن بعض المنياوية يحاولون التحدث بلهجة القاهرة، فما هي السياقات التي يُتوقَع أن يحدث فيها ذلك؟ يمكنك اختيار أكثر من إجابة.

- ❑ سياق رسمي مثل حوار بين رئيس مصلحة وأحد من يرأسهم
- ❑ سياق غير رسمي مثل حوار بين أصدقاء

21. إذا كنت في مقابلة للحصول على وظيفة، فما هي اللهجة التي ستستخدمها/ستحاول استخدامها؟ يمكنك اختيار أكثر من إجابة.

- ❑ سأستخدم لهجة المنيا إذا كانت المقابلة في المنيا
- ❑ سأستخدم لهجة المنيا إذا كانت المقابلة في القاهرة
- ❑ سأستخدم/سأحاول استخدام لهجة القاهرة إذا كانت المقابلة في القاهرة
- ❑ سأستخدم/سأحاول استخدام لهجة القاهرة إذا كانت المقابلة في المنيا
- ❑ سأستخدم لهجة المنيا إذا كانت المقابلة في أي مكان آخر غير القاهرة الشرقية مثلاً
- ❑ سأستخدم/سأحاول استخدام لهجة القاهرة إذا كانت المقابلة في أي مكان آخر غير القاهرة الشرقية مثلاُ

22. برأيك، لماذا يلجأ بعض المنياوية لاستخدام لهجة القاهرة ؟

شكراً جزيلاً على وقتك وسعة صدرك.

Department of Language and
Linguistic Science
Heslington, York, YO10 5DD, UK

UNIVERSITY of York

INFORMATION SHEET

You are invited to take part in a research study. Before you decide whether to participate it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully. If there is anything you do not understand, or if you want more information, please contact the researcher.

Title
Dialect Convergence in Egypt: The Impact of Cairene Arabic on Minya Arabic

Researcher
Saudi Sadiq Muhammad Muhammad

1. What is the research about?
The study is about dialect convergence in Egypt and how this is reflected in the convergence of Minya Arabic speakers on Cairene Arabic. The main interest of the research is phonological convergence.

2. Who is carrying out the research?
The study is carried out by the PhD researcher named above under the supervision of **Prof. Paul Kerswill**, Professor of Sociolinguistics, and **Dr. Sam Hellmuth**, Lecturer in Phonology, at the Language and Linguistic Science Department, the University of York, UK.

3. Why have you been chosen to participate?
You have been chosen as you are a Minya-Arabic native speaker who meets the aim of the study (see 1 above).

4. What does the study involve?
The questionnaire is divided into 6 sections. In section I, you will be asked some personal questions (sex, age, education, residence, and how you are in contact with Cairo Arabic). Then, in Section II, you will be asked about your attitudes towards Cairo Arabic and Minya Arabic in general and the linguistic differences between the two dialects. In Section III, you will be asked to judge how likely the linguistic features distinguishing Minya Arabic are likely to be abandoned in the case of convergence on Cairo Arabic. In Section IV, you will be asked about your personal use of Cairo Arabic (how, in what context and why). In section V, you will be asked about your expectations regarding the adoption of Cairo Arabic in Minya and how this is related to the social factors under study (gender, age, education and residence). And in

Section VI, you will be asked about the role of identity in language change and maintenance in Minya.

5. Do I have to take part?

You do not have to take part in this questionnaire. If you decide to take part, you can save this information sheet on your computer or any device of your choice and will be asked to tick all the cells in the consent form at the start of the online questionnaire to show your consent. If, in the middle of the questionnaire, you decided to withdraw without giving a reason, you can shut the browser down. In this way, the answers you have given will not be saved.

6. What are the possible risks of taking part?

There are no possible risks of taking part in this questionnaire.

7. Are there any benefits to participating?

As a thank you from the researcher, there are two 100 Egyptian pounds. If you like to be entered into a prize draw to win one of these prizes, you will be required to enter your email address so that you can be contacted if you win. Make sure that the email address will be part of the answers known by the researcher alone.

8. What will happen to the data I provide?

The answers will be used alongside the answers of other participants to measure how and why Minya Arabic speakers converge on Cairene Arabic. Your answers will be stored securely on the servers of the University of York.

9. What about confidentiality?

Your identity will be kept strictly confidential. No real names will be used in any presentations, publications or in my dissertation.

10. Will I know the results?

Only group results could be given. You can contact the researcher (at the email given below) if you have a passion to know the final results.

This study has been reviewed and approved by the Departmental Ethics Committee of the Department of Language and Linguistic Science at the University of York. If you have any questions regarding this, you can contact the chair of the L&LS Ethics Committee, **Márton Sóskuthy**, (email: marton.soskuthy@york.ac.uk; Tel: (01904) 324171).

If you have further questions regarding this study, please feel free to contact:

Saudi Sadiq Muhammad Muhammad
Department of Language and Linguistic Science
University of York, Heslington, York, YO10 5DD
Email: ss1272@york.ac.uk

Department of Language and Linguistic Science
Heslington, York, YO10 5DD, UK
ss1272@york.ac.uk

UNIVERSITY of York

CONSENT FORM

Project Title:

Dialect Convergence in Egypt: The Impact of Cairene Arabic on Minya Arabic

Researcher: **Saudi Sadiq Muhammad Muhammad**

This form is for you to state whether or not you agree to take part in the questionnaire. Please read and answer every question. If there is anything you do not understand, or if you want more information, please contact the researcher.

Have you read and understood the information leaflet about the study?	Yes ❒ No ❒
Have you had an opportunity to ask questions about the questionnaire and have these been answered satisfactorily?	Yes ❒ No ❒
Do you understand that the information you provide will be held in confidence by the research team, and your name or identifying information about you will not be mentioned in any publication?	Yes ❒ No ❒
Do you understand that you may withdraw from the questionnaire at any time before submitting your answers without giving any reason, and that in such a case all your answers will be not be saved?	Yes ❒ No ❒
Do you understand that the information you provide may be kept after the duration of the current project, to be used in future research on language?	Yes ❒ No ❒
Do you agree to take part in the study?	Yes ❒ No ❒
Do you agree to excerpts from your answers to be used in presentations or in teaching by the researcher, without disclosing your real name? *(You may take part in the study without agreeing to this).*	Yes ❒ No ❒
Do you agree to the researcher's keeping your contact details after the end of the current project, in order that s/he may contact you in the future about possible participation in other studies? *(You may take part in the study without agreeing to this).*	Yes ❒ No ❒

Dialect Convergence in Egypt: The Impact of Cairo Arabic on Minya Arabic

Introduction:

This questionnaire is part of a PhD project conducted by Saudi Sadiq, PhD candidate at the Language and Linguistic Science Department, the University of York, UK, under the supervision of Prof. Paul Kerswill, Professor of Sociolinguistics, and Dr. Sam Hellmuth, Senior Lecturer in Phonology. The study is aimed at investigating dialect convergence in Egypt in general and the impact of Cairo Arabic on Minya Arabic in particular in terms of phonological. Whether you are one of the participants who were interviewed in this study in 2012 or not, you are kindly invited here to take part in this questionnaire aimed at disclosing the reasons why MA speakers converge, partially or completely, to Cairo Arabic; how this occurs; the linguistic features most likely to change in Minya Arabic and the role of identity in language change and maintenance in Minya. To let you know,

- The information you provide will be held in confidence by the research team.
- Your name or identifying information will not be mentioned in any publication.
- The information you provide may be kept after the duration of the current project, to be used in future research on language.

If you have further questions regarding this study, please feel free to contact us at: ss1272@york.ac.uk

To complete this questionnaire, you must have been born in Minya Governorate.

Personal information on participants

1. Name (optional)

2. Gender

- o Male
- o Female

3. How old are you?

- o 18-20
- o 21-30
- o 31-40
- o 41-50
- o 51-60
- o 61-70
- o 71-80
- o +80

4. Where were you born?

- o I was born in Edwa District or one of its villages
- o I was born in Maghagha District or one of its villages
- o I was born in Bani Mazar District or one of its villages
- o I was born in Matay District or one of its villages
- o I was born in Samalout District or one of its villages
- o I was born in Minya City
- o I was born in one of the villages attached to Minya City

- ○ I was born in New Minya Town
- ○ I was born in Abu Qurqas District or one of its villages
- ○ I was born in Mallawi District or one of its villages
- ○ I was born in Deir Muwas District or one of its villages

5. Where were you born and where do you live?
- ○ I was born and live in the countryside
- ○ I was born and live in town
- ○ I was born in the countryside but live now in town
- ○ I was born in town but live now in the countryside

6. What is the highest degree you obtained?
- ○ I am uneducated
- ○ Primary
- ○ Preparatory
- ○ Secondary school, 3 or 5-year technical certificate or equivalent
- ○ Post-secondary (e.g. pre-university institute) or equivalent
- ○ Bachelor's degree or equivalent
- ○ Master's degree or equivalent
- ○ PhD or equivalent
- ○ Postdoctoral degree or equivalent

7. How did you get familiar with Cairo Arabic? You can choose one answer or all answers.
- ○ Direct contact with Cairenes in Cairo
- ○ Direct contact with Cairenes in Minya
- ○ Direct contact with Cairenes in any other place
- ○ Media (radio, TV, cinema and the Internet)

Participants' Evaluation of CA and MA

8. Following is a list summing up the unique features of Cairo Arabic. How do you see or evaluate these linguistic features? To listen to the example/s, please click the word/s in blue. You can also choose more than one answer.

	More appropriate for town	More appropriate for the countryside	More appropriate for females	More appropriate for males	More appropriate for the educated	More appropriate for the non-educated	More appropriate for the old	More appropriate for the young
(q) sound in [ʔalb]								
Vowels in [jɪtkallɪm]								
Vowels in [jɪxallɪf]								
Vowels in [jɪwɑsˤsˤɑl]								
Stress in [madˈrasa]								

9. Following is a list summing up the unique features of Minya Arabic. How do you see or evaluate

these linguistic features? To listen to the example/s, please click the word/s in blue. You can also choose more than one answer.

	More appropriate for town	More appropriate for the countryside	More appropriate for females	More appropriate for males	More appropriate for the educated	More appropriate for the non-educated	More appropriate for the old	More appropriate for the young
(q) sound in [galb]								
Vowels in [jɪtkɪllɪm] or [jɪtkallam]								
Vowels in [jɪxallaf]								
Vowels in [jɪwɑsˤsˤɪl]								
Stress in [ˈmadɾasa]								

10. Supposing that someone from Minya Governorate is trying to use Cairo Arabic, what are the Minya Arabic features that are likely to be abandoned? Here is a list summing up the main differences between Cairo Arabic and Minya Arabic. In front of every feature, there are three likelihood scales regarding the likelihood of using Cairo Arabic features instead of the Minya Arabic ones, starting with '*likely*' and ending with '*unlikely*'. Please, choose the likelihood scale you see as most suitable. To listen to the example, you can click the word in blue.

	likely	neutral	unlikely
(q) sound in [galb]			
Vowels in [jɪtkɪllɪm] or [jɪtkallam]			
Vowels in [jɪxallaf]			
Vowels in [jɪwɑsˤsˤɪl]			
Stress in [ˈmadɾasa]			

Participants' use of Cairo Arabic

11. Do you use Cairo Arabic?
- o Yes
- o No

12. Does this percentage rely on how long you watch TV?
- o Yes
- o No

Participants' expectations for the use of Cairo Arabic in Minya

13. Knowing that some Minya Arabic speakers try to use Cairo Arabic, who do you guess is likely to do this? You can choose more than one answer and mention the reason/s for your choice in the blank provided below the options.
- o Males

- Females

14. Knowing that some Minya Arabic speakers try to use Cairo Arabic, who do you guess is likely to do this? You can choose more than one answer and mention the reason/s for your choice in the blank provided below the options.

- The young
- The middle-aged
- The old

15. Knowing that some Minya Arabic speakers try to use Cairo Arabic, who do you guess is likely to do this? You can choose more than one answer and mention the reason/s for your choice in the blank provided below the options.

- Urbanites
- Villagers
- Rural migrants to town

16. Knowing that some Minya Arabic speakers try to use Cairo Arabic, who do you guess is likely to do this?

- The educated and non-educated
- The educated alone
- The non-educated alone

17. Then, what do you expect?

- The higher the educational level, the more Cairo Arabic is used.
- The higher the educational level, the less Cairo Arabic is used.

18. Knowing that some Minya Arabic speakers try to use Cairo Arabic, who do you guess is likely to do this?

- Single males
- Single females
- Fiancés
- Fiancées
- Married men
- Married women
- Ex-husbands
- Ex-wives
- Widowers
- Widows

19. Knowing that some Minya Arabic speakers try to use Cairo Arabic, in what context do you guess they are likely to do this?

- A formal context (e.g. a conversation between a superior and inferior)
- An informal context (a conversation between two friends)

20. If you are attending a job interview, what dialect would you use?

- I will use Minya Arabic if the interview is held in Minya.
- I will use Minya Arabic if the interview is held in Cairo.
- I will use Cairo Arabic if the interview is held in Cairo.
- I will use Cairo Arabic if the interview is held in Minya.

- I will use Minya Arabic if the interview is held in any place away from Cairo.
- I will use Cairo Arabic if the interview is held in any place away from Cairo.

21. What do you think? Why do some Minya Arabic speakers switch to Cairo Arabic?

Appendix 6: Egyptian Arabic Verb Forms

An extract from (Abdel-Massih, Abdel-Malek, & Badawi, 1979, pp. 294-295)

	Sound		Doubled	
	Perfect	Imperfect	Perfect	Imperfect
I	FaʕaL or FiʕiL (katab 'to write' ʕirif 'to know')	a yiFʕiL (see Note u 6 for examples)	Faʕʕ (ʕadd 'to count', marr 'to pass')	yiFiʕʕ (yiʕidd) or yiFuʕʕ (yimurr)
II	FaʕʕaL (ħassan 'to fortify') FaʕʕiL (darris 'to teach')	yiFaʕʕiL (yiħassan) yiFaʕʕiL (yidarris)	Faʕʕaʕ (karrar 'to repeat') Faʕʕiʕ (sabbib 'to cause')	yiFaʕʕaʕ (yikarrar) yiFaʕʕiʕ (yisabbib)
III	FaaʕiL (kaatib 'to correspond with')	yiFaaʕiL (yikaatib)		
IV	aFʕaL (aʕdam 'to execute')	yiFʕiL (yiʕdim)	aFaʕʕ (aʕadd 'to prepare (some-thing)')	yiFiʕʕ (yiʕidd)
V	itFaʕʕaL (itħassan 'to be fortified') itFaʕʕiL (itʕazzib 'to suffer')	yitFaʕʕaL (yitħassan) yitFaʕʕiL (yitʕazzib)	itFaʕʕaʕ (itkarrar 'to be repeated') itFaʕʕiʕ (itbaddid 'to be dispersed')	yitFaʕʕaʕ (yitkarrar) yitFaʕʕiʕ (yitbaddid)
VI	itFaaʕiL (itkaatib 'to correspond with each other')	yitFaaʕiL (yitkaatib)		
VIIA	inFaʕaL (insaħab 'to withdraw')*	yinFiʕiL (yinsiħib)	inFaʕʕ (inšaʔʔ 'to split')	yinFaʕʕ (yinšaʔʔ)
VIII	iFtaʕaL (ištarak) 'to participate')	yiFtiʕiL (yištirik)	iFtaʕʕ (iħtadd 'to become angry')	yiFtaʕʕ (yiħtadd)
IX	iFʕaLL (iħmarr 'to turn red')	yiFʕaLL (yiħmarr)		
X	istaFʕaL (istaʕbat 'to act stupid') istaFʕiL (istaʕmil 'to use')**	yistaFʕaL (yistaʕbat) yistaFʕiL (yistaʕmil)	istaFaʕʕ (istaʕadd 'to get ready')	yistaFiʕʕ (yistaʕidd)
VIIB	itFaʕaL (itnaʔal 'to be transferred')	yitFiʕiL (yitniʔil)	itFaʕʕ (itgann 'to 'to become insane')	yitFaʕʕ (yitgann)
+ II	istaFaʕʕaL (istalaʔʔaf 'to catch (e.g., a ball)')	yistaFaʕʕaL (yistalaʔʔaf)	istaFaʕʕaʕ (istaħammam 'to bathe')	yistaFaʕʕaʕ (yistaħammam)

Hollow		Defective	
Perfect	Imperfect	Perfect	Imperfect
FaaL (raaħ 'to go', naam 'to sleep', gaab 'to bring')	yiFuuL (yiruuħ) yiFaaL (yinaam) yiFiiL (yigiib)	Faʕa (raga 'to implore', daʕa 'to invite', bana 'to build, saʕa 'to attempt') or Fiʕi (nisi 'to forget', giri 'to run')	yiFʕu (yirgu), yiFʕi (yidʕi, yibni), or yiFʕa (yisʕa) yiFʕa (yinsa) or yiFʕi (yigri)
Faʕʕal (ʕawwar 'to injure', bayyad 'to paint') Faʕʕil (kawwin 'to form', ʕayyin 'to appoint')	yiFaʕʕaL (yiʕawwar, yibayyad) yiFaʕʕiL (yikawwin, yiʕayyin)	Faʕʕa (rabba 'to rear, bring up')	yiFaʕʕi (yirabbi)
FaaʕiL (ħaawil 'to try', ʕaayin 'to inspect')	yiFaaʕiL (yiħaawil, yiʕaayin)	Faaʕa (naada 'to call to')	yiFaaʕi (yinaadi)
aFaaL (azaal 'to remove')	yiFiiL (yiziil)	aFʕa (ayra 'to entice')	yiFʕi (yiyri)
itFaʕʕaL (ittawwar 'to evolve', itħayyar 'to be puzzled') itFaʕʕiL (itʕawwid 'to become accustomed', itʕayyin 'to be appointed')	yitFaʕʕaL (yittawwar, yitħayyar) yitFaʕʕiL (yitʕawwid, yitʕayyin)	itFaʕʕa (itmanna 'to wish')	yitFaʕʕa (yitmanna)
itFaaʕiL (itʕaawin 'to co-operate', itħaayil 'to plead')	yitFaaʕiL (yitʕaawin yitħaayil)	itFaaʕa (itfaada 'to avoid')	yitFaaʕa (yitfaada)
inFaaL (insaab 'to flow')	yinFaaL (yinsaab)	inFaʕa (inmaħa 'to vanish')	yinFiʕi (yinmiħi)
iFtaaL (iħtaag 'to be in need')	yiFtaaL (yiħtaag)	iFtaʕa (intaha 'to end')	yiFtiʕi (yintihi)
iFʕaLL (iswadd 'to turn black', ibyadd 'to turn white')	yiFʕaLL (yiswadd, yibyadd)	iFʕaLL (iħlaww 'to become good-looking')	yiFʕaLL (yiħlaww)
istaFaaL (istagaab 'to respond)	yistaFiiL (yistagiib)	istaFʕa (istayla 'to consider something expensive')	yistaFʕi yistaFʕa (yistayli yistayla)
itFaaL (itbaaʕ 'to be sold')	yitFaaL (yitbaaʕ)	itFaʕa (itʕama 'to become blind')	yitFiʕi (yitʕimi)
istaFaʕʕaL (istarayyaħ 'to rest')	yistaFaʕʕaL (yistarayyaħ)	istaFaʕʕa (istayamma 'to blindfold oneself', istaragga 'to implore', istaxabba 'to hide')	yistaFaʕʕa (yistayamma, yistaragga, yistaxabba)

LIST OF ABBREVIATIONS

1^{st}	first speaker
2^{nd}	second speaker
3^{rd}	third speaker
AA	Amman Arabic
AIC	Akaike Information Criterion
BA	Beirut Arabic
BIC	Bayesian Information Criterion
BMA	Bedouin Minya Arabic
CA	Cairo Arabic
DA	Damascus Arabic
EA	Egyptian Arabic
fem.	feminine
glmer	generalised linear mixed effects regression
GLMM	generalised linear mixed model
JA	Jerusalem Arabic
MA	Minya Arabic
masc.	masculine
NMA	North Minya Arabic
NMEA	Northern Middle Egypt Arabic
PCGN	Permanent Committee on Geographical Names for British Official Use
pl.	plural
sing.	singular
SMA	South Minya Arabic

SMEA	Southern Middle Egypt Arabic
UEAr	Upper-Egyptian Arabic
VPC	variance partition coefficient

Glossary

SOUND VERB

Sound or regular verbs consist of three consonants, none of which are wâw, yâ' or hamza.

Examples:

k-t-b ك - ت - ب *to write*

h-r-b هـ - ر - ب *to flee*

DOUBLED VERB

Doubled verbs consist of three consonants, the last two of which are the same.

Examples:

j-r-r ج – ر - ر to *drag*

s-b-b س - ب - ب to *cause*

DEFECTIVE VERB

Defective verbs are the verbs where the final consonant is either wâw or yâ'.

Examples:

b-n-a ب - ن - ى to *build*

sh-k-w ش- ك - و to *complain*

HOLLOW VERB

Hollow verbs are those in which the second or middle consonant is either wâw or yâ'.

Examples:

q-w-l ق - و - ل to *say*

b-y-' ب - ي - ع to *sell*

PAUSAL IMĀLA

A shift in the pronunciation of a final low/open vowel to high/close one as in the realisation of final /a/ in [ˈkılma] '*word*' as [ˈkılmi] or [ˈkılme].

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