

The Role of Partial Desemanticization in the Emergence of Grammatical Subsystems: The Case of Epistemic Modality in Northern Rural Jordanian Arabic

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Abstract—Desemanticization, a mechanism of language change, is either full or partial. The former is the total loss of the lexical content while developing a gram from a lexical source, whereas the latter is the reduction of the lexical content. One of the merits of partial desemanticization reported in the relevant literature is that the remaining lexical residue in a gram often determines its function, especially through metaphor and metonymy. The present paper, from a broader perspective, sheds light on the role of partial desemanticization in developing grammatical subsystems in natural languages. Based on an acceptability judgment task and the main synchronic characteristics of the target items, this paper argues that partial desemanticization is the underpinning factor in the grammaticalization of a possibility-denoting epistemic modality in northern rural Jordanian Arabic. Its role is manifested in the derivation of the target modal auxiliaries from their lexical counterparts. The content of their sources, mostly lexical, is not fully bleached out when they develop into modal auxiliaries. The semantic residue of the source in each grammaticalized modal auxiliary, in turn, causes the variation in use of these modal auxiliaries, and therefore inevitably leads to developing a possibility-denoting epistemic modality.

Index Terms—grammaticalization, partial desemanticization, possibility-denoting epistemic modality, northern rural Jordanian Arabic

I. INTRODUCTION

Grammaticalization is a type of language change that occurs in pathways and involves interacting phonological, morphosyntactic and semantic processes that apply gradually to form grammar typically by selecting items from the lexical domain and dropping them into grammar (Bybee et al., 1991; Lehmann, 1995; Narrog, 2012). It mainly relies on the following four main mechanisms: (1) desemanticization, (2) decategorization, (3) phonetic reduction and (4) obligatorification.

In the relevant literature, desemanticization or semantic bleaching, which is the main concern of the current study, is regarded as an important mechanism of grammaticalization that branches into full and partial. Full desemanticization leads to the total loss of the meaning of the lexical source in the developed gram, whereas partial desemanticization reduces it (Meillet, 1912; Heine et al., 1991; Hopper & Traugott, 1993; Lehmann, 1995; Heine, 2013, among others).

What can be inferred from the relevant literature is that partial desemanticization is prevailing in natural languages. Consider the following examples from English that assert this inference. The development of the Old English lexical verb *willan* 'to want' that denotes volition into the epistemic modal auxiliary *will* that expresses futurity (Véiz Campos, 2007) is accompanied by partial desemanticization of the lexical verb *willan*. To clarify, the modal auxiliary *will* in *the wall will collapse* does not denote volition, as the subject is inanimate, yet this meaning is yielded in sentences where the subject is human, such as *I will leave in a minute* where the speaker wants to do something in the future. Another English modal auxiliary is *may* that is derived from the Old English lexical verb *magan* which denotes ability. Specifically, *magan* means to be able to or have the power to (Véiz Campos, 2007). What emphasizes partial desemanticization in this example is that one of the possible uses of the modal *may*, which is permission, is clearly linked to the lexical meaning of *magan*, which is ability. Specifically, it is a common grammaticalization pathway in many natural languages that a lexical source denoting ability can acquire other meanings, such as permission (Bybee, 1985, 1988), and permission in essence comprises the meaning of ability. It can be reinterpreted as follows: someone is able to do something, as s/he is given the opportunity to do it. Another modal auxiliary in English that indicates that partial desemanticization is common is *ought*, which is developed from a verb that means to owe (van der Auwera & Van Olmen, 2019). The semantic relation between the modal *ought* and its lexical source is manifested in their shared

meaning of obligation. Lexical *ought* means that it is obligatory to pay in return for receiving something and the modal *ought* is used with moral obligations and duties, as in *you ought to show respect*.

The inference that partial desemanticization seems the norm in natural languages is self-explanatory, as partial desemanticization often does not deprive grams of all the content of their lexical sources. Otherwise, all the developed grams that serve similar functions, such as modal auxiliaries, will not differ in use, and therefore most of them will be subject to be abandoned by language speakers over time. In contrast, the leakage of some of the content of each lexical source to its developed gram causes grammatical richness. Specifically, two or a few related grams could serve one function, yet each one has its own peculiarities, such as the variation in the use of the English modal auxiliaries mentioned above. Hence, partial desemanticization, which has a vital role in developing new grams in language, can be crucial to the evolution of grammatical subsystems within language.¹

From a diachronic perspective, the regularity of semantic change and the degree of semantic reduction and expansion while grammaticalizing a function word from a lexical source or another functional element, have gained much attention in the relevant literature (e.g., Givón, 1971; Bybee, 1985; Bybee & Pagliuca, 1985; Traugott, 1982, 1988). Further, some efforts have been made to determine what aspects of lexical content are preserved and what are lost in grams (e.g., Sweetser, 1988). However, investigating how semantic change in the form of reduction leads to the emergence of a grammatical subsystem within a language, as far as I can tell, has received little or even no attention in the relevant literature on grammaticalization. For example, there are some scholarly attempts to diachronically and/or synchronically investigate the development of single instances of English modal verbs (Bybee, 1985). Nonetheless, the scarcity of studies that comprehensively explore the development of the members within a grammatical subsystem of a language, underestimates the importance of partial desemanticization (or conversely the persistence of some lexical content in a developed gram) in the emergence of these grammatical subsystems.

The current study is to highlight the role of partial desemanticization in developing grammatical subsystems within a language. Particularly, it shows that this mechanism paves the way for the grammaticalization of possibility-denoting epistemic modality in northern rural Jordanian Arabic (henceforth NRJA), which comprises the following modal auxiliaries: *bidzuuz*, *jimkin*, *xaaf* and *laa jkuun*. This possibility-denoting epistemic modality relies on the variation in use, which is due to the extra-meanings beyond possibility that some of these auxiliaries convey. Specifically, *bidzuuz* and *jimkin* neutrally denote possibility, whereas others express speaker's attitude. Specifically, *xaaf* expresses worriedness and *laa jkuun* conveys the unlikelihood of the occurrence of an event or the truth of a proposition (i.e., weak possibility). Thus, these modals cannot be used interchangeably except for *bidzuuz* and *jimkin* that equally denote possibility with no attitude. The role of partial desemanticization in the development of this type of modality in NRJA is manifested in the derivation of these four modal auxiliaries from their sources which are often lexical. More specifically, the meaningful content of their sources is not fully bleached out when some of them develop into modal auxiliaries. This implies that the semantic residue of the sources in these modal auxiliaries causes the variation in use, and therefore helps in grammaticalizing possibility-denoting epistemic modality in NRJA.

The rest of this section sets the stage by showing that modality in Arabic gained little attention and having a quick look at the uses of the target four possibility-denoting modal auxiliaries in NRJA.

Setting the stage

Epistemic modality is concerned with the degree of speaker's commitment to the truth of a particular proposition following the modal auxiliary (Palmer, 2001; Bybee & Fleischman, 1995). When modal auxiliaries are used epistemically, they indicate the certainty, probability or possibility of a specific proposition based on evidence or previous knowledge. To illustrate, as a reply to 'Where is John?' *must* shows certainty in 'He must/might be in his office', whereas *might* indicates possibility. The use of *must* indicates that the speaker has solid evidence that *John* is in his office (e.g., the speaker knows well that John has some work to finish in his office today). On the other hand, the use of *might* indicates that the speaker suggests that it is possible that John is in his office due to the lack of such evidence. It could be based on the circumstantial evidence that today is a working day. Therefore, *John* is expected to be in his office.

Modality, in general, has gained little attention in the relevant literature on Arabic. Moreover, Arab linguists refrain from proposing that Arabic has explicitly grammaticalized modality, unlike English. One possible reason is that various expressions can express one aspect of modality in Arabic (Hassan, 1990). To illustrate, English *may* that denotes possibility in 'may be at home' can be translated as *jumkinu*, *rubbama* or *qad jakuunu* in Standard Arabic. What also argues against the proposal that Arabic has a system of modality is that there is no (or tiny) difference in use among the lexical expressions that convey a particular aspect of modality. *jumkinu* and all of its alternatives above can be used interchangeably, keeping the meaning constant. Another counterargument is syntactic: more than one syntactic category of a lexical item can be exploited in expressing modality in Arabic, such as the verb *juhtamalu* and its prepositional counterpart PP[P[*mina*] NP[*ʔal-juhtamali*]].

¹ Partial desemanticization has another function. It asserts that the meaning of a gram is not necessarily assigned by the grammar system of a language (i.e., the gram is not necessarily primitive and has no lexical source). Instead, it provides evidence supporting the proposal that a gram inherits its grammatical meaning from the semantics of its lexical source (Bybee, 1988).

This paper focuses on NRJA, a spoken Arabic variety. It argues that it has epistemic modality expressing possibility.² More specifically, it has a number of grammaticalized modal auxiliaries expressing possibilities with some variation in use. These grammaticalized modal auxiliaries are *bidzuuz*, *jimkin*, *xaaf* and *laa jkuun*. In this study, the argument for this type of modality is supported by the observation that most of the modal auxiliaries mentioned above are not interchangeable, as they vary in use. To realize the variation in the use of these modal auxiliaries, consider the example in (1). To contextualize, a couple left their house for a short period while their relatives were talking. At the current moment of talking, they are back and are standing at the front door. Speaker 1, the husband, is looking at Speaker 2, his wife, and is showing his astonishment that there is no one in their house. The wife in (1b) can use one of the modal auxiliaries *bidzuuz* or *xaaf* to comment on the truth of the proposition in *they left*. However, they are not interchangeable. The modal *bidzuuz* neutrally shows that the proposition that *they left* is possible. On the other hand, *xaaf* adds some extra meaning expressing speaker's attitude. It indicates that the wife wants to show her *worriedness* that they left. She, maybe, wanted them to stay longer.

(1) a. Speaker 1: *mif faajif hada b-il-beet*
 NEG see.GER one in-DEF-house
 'I see no one in our house.'

b. Speaker 2: *bidzuuz/xaaf rawwaahu*
 may left-3PL.M
 'They may be, left.'

The second goal of the current study is to investigate the source of this variation in use, more specifically in speaker's attitude. It proposes that the cause of this variation in use is captured by referring to the grammaticalization of these auxiliaries. It is shown that the semantic residue of the source that is preserved in these auxiliaries is the main factor in determining the speaker's intention expressed by some of these auxiliaries. To illustrate, some semantic content of the source item persists in its grammatical counterpart, the modal auxiliary. Thus, partial desemanticization, a mechanism of grammaticalization (Heine, 2003), is the main factor in the emergence of epistemic modality that expresses possibility with various meaningful extensions (i.e., speaker's attitude) in NRJA. On this basis, this study proposes that partial desemanticization is not only a grammaticalization mechanism that applies while creating a new gram, but also a factor that can be crucial to developing a grammatical subsystem in language (e.g., possibility-denoting epistemic modality with variation in use).

This research paper is outlined as follows: Section 2 offers the acceptability judgment task that is structured to determine the denotation and use of each possibility-denoting auxiliary in NRJA. Based on the results of this task and some synchronic properties of the target four auxiliaries, Section 3 shows that most of the target verbs expressing possibility in NRJA differ in use. In the same section, the grammaticalization pathways to the target modal auxiliaries are proposed and the importance of partial desemanticization in forming possibility-denoting epistemic modality with variation in speaker's attitude in NRJA is explicated. Section 4 concludes the paper.

II. METHOD

To determine whether the target four auxiliaries used by native speakers of NRJA are possibility-denoting epistemic modals with variation in use, a test consisting of 20 items was designed by the researcher, who is a native speaker of NRJA. It was assigned to 20 native speakers of this Jordanian sub-variety (10 males and 10 females). Their ages range from 18 to 52 and they all were raised in the rural areas of the governorate of Irbid in the northwestern part of Jordan.

Participants were asked to evaluate 20 contextless conversational turns to ensure that they could not rely on the context to guess the attitude that each modal expresses. These turns were divided into 4 groups. Every 5 turns are to decide the denotation of one of the target modal auxiliaries, namely *bidzuuz*, *jimkin*, *xaaf*, and *laa jkuun*. The total number of answers is 400 (20 turns x 20 native speakers of NRJA). The turns were randomly presented.

The participants were asked to decide the interpretation of each sentence. Does it neutrally denote possibility or is it paired with one of the following semantic extensions (i.e., speaker's attitudes): speaker's worriedness or speaker's attitude that expresses the unlikelihood of either the occurrence of an event or the truth of a proposition. Based on the intuition of the researcher as a native speaker of NRJA, the native speakers are predicted to treat *bidzuuz* and *jimkin* as neutrally possibility-denoting modals. Concerning the rest, they are predicted to be associated with different attitudes; *xaaf* with worriedness and *laa jkuun* with unlikelihood (of the truth of a proposition or the occurrence of an event).

Consider the contextless conversational turn in (2b), where the target sentence from NRJA that embeds *bidzuuz* is followed by 4 possible *interpretations*. The task of each participant is to select the option that *bidzuuz* expresses. The full list of NRJA turns is provided in the appendix. Option a is expected to be selected if the target sentence embeds *bidzuuz* or *jimkin*.

(2) a. Speaker 1: *mif faajif hada b-il-beet*
 NEG see.GER one in-DEF-house
 'I see no one in our house.'

b. Speaker 2: *bidzuuz rawwaahu*

² Modal auxiliaries that denote certainty and probability are out of the scope of the present paper.

may left-3PL.M
 ‘They may be, left.’

- (a) It is possible that people left.
 (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened.
 (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.

Option b should be chosen if the target sentence hosts *xaaf*. Concerning Option c, it should be selected when the target sentence hosts *laa jkuun*.

III. THE GRAMMATICALIZATION OF POSSIBILITY-DENOTING MODALITY IN NORTHERN RURAL JORDANIAN ARABIC

The results of the acceptability judgment task indicate that the initial predictions provided at the end of Section 2 are borne out. First, all the participants invariably selected Option a when the target sentence embeds *bidzuuz* or *jimkin*. Likewise, Option b is constantly selected when the host sentence contains *xaaf*. These results assert that *bidzuuz* and *jimkin* neutrally denote possibility, whereas *xaaf* denotes possibility paired with worriedness. Regarding *laa jkuun*, Option c was selected 92 times (out of 100) when this item is used. Three participants selected Option a as the correct interpretation of 8 sentences containing *laa jkuun*: one male participant chose Option a one time, one female participant chose the same Option a 2 times, and the last female informant selected Option a as the optimal interpretation for all the five sentences. These 8 answers may mean that it is possible that *laa jkuun* can sometimes be used or interpreted by some native speakers as a neutral indicator of possibility. However, the selection of Option c as the best interpretation 92 times clearly indicates that *laa jkuun* is often paired with the intention of unlikelihood in NRJA.

Based on the findings of the acceptability judgment task and the main characteristics of the target modal auxiliaries, it is argued in the rest of this section that they are possibility-denoting modal auxiliaries developed from different sources (mainly lexical) in NRJA with different meaningful extensions, namely neutrality, worriedness and unlikelihood.

All the examples from NRJA in this section were composed by the researcher and their grammaticality and acceptability were judged by 6 native speakers of NRJA (3 males and 3 females) who did not participate in the previous acceptability judgment task. Their ages range from 24 to 46.

A. Possibility-Denoting *Bidzuuz* and *Jimkin*

In this part, it is argued that *bidzuuz* and *jimkin* develop into modal verbs that indicate possibility in NRJA. Their grammaticalization pathway is *permission-denoting verb* → *possibility-denoting modal auxiliary*. This pathway is attested in natural languages, such as *may* in English and some modal verbs in Brazilian Portuguese (Bybee, 1985; Hattner & Hengeveld, 2016).

To visualize the grammaticalization of the two modal auxiliaries *bidzuuz* and *jimkin*, their lexical sources should be investigated first. Lexical *bidzuuz* means ‘is allowed’. As for the lexical *jimkin*, it is formed from the tri-consonantal root *mkn* whose semantic core is ability. Thus, the evolution of the functional *jimkin* is analogous to that of the English modal verb *may*, which is derived from *magan* ‘to be able to’ or ‘to have the power to’ (Véliz Campos, 2007).

The first piece of evidence arguing with the grammaticalization of these two modals (i.e., they are grams with lexical sources) is that their lexical counterparts did not evolve into modal auxiliaries in all Arabic varieties. Standard Arabic, for example, has the two lexical items but lacks the epistemic modal counterparts. Consider the sentence in (3) which is unattested in Standard Arabic, as *jadzuuz* and *jumkin* in this Arabic variety cannot be used to denote possibility.

- (3) **jadzuuz-u/jumkin-u inna-hum saafar-u*
 allowed-NOM/is possible-NOM COMPL.-3PL.Mtravel-3PL.M
 Intended: ‘They may be traveled.’

Exceptionally, *jumkin* can be used in Standard Arabic to denote general epistemic possibility if it is based on scientific evidence (i.e., undeniable facts), as in (4). This observation implies that *jumkin* is evolved to an epistemic modal denoting general possibility that could only refer to scientific facts; however, it does not develop further into a possibility-denoting modal that may be paired with different events, actions and propositions. Note here that the grammaticalization pathway *general epistemic possibility* → *possibility-denoting epistemic modal auxiliary* is a common grammaticalization pathway in natural languages, as reported in Bybee (1985, 1988) and Bybee et al. (1991). This common pathway indicates that further grammaticalization of *jumkin* occurred in NRJA but not in Standard Arabic.

- (4) *jumkin-u ?an jas^sda? ?al-hadiid*
 May-NOM COMP. rust.3SG.M DEF-iron
 ‘Iron may rust.’

The mechanisms of the grammaticalization of *bijuuz* (but not *jimkin*) in NRJA can straightforwardly be synchronically diagnosed. The first mechanism pertaining to the grammaticalization of *bijuuz* is decategorization, which is the shift from a major category to a minor category that causes the loss of some or all characterizing properties of the lexical source (Hopper & Traugott, 1993; Heine, 2003; Heine & Kuteva, 2002).

To explain the shift to the grammatical domain, the semantic, syntactic and morphological changes are identified below.

The lexical *bijuuz*, which denotes permission, acts as the predicate nucleus of a phrase and selects arguments. In (5), for instance, it is the predicate of the sentence and takes *?is-safar* as its external argument. It also selects the prepositional phrase *la-ħmad* as its complement.

- (5) a. *?is-safar* *bidzuuz* *la-ħmad*
 DEF-travelling allowed.3SG.M to-Ahmad.
 ‘Ahmad is allowed to travel.’

Furthermore, lexical *bijuuz* must get inflected for the phi-features of its subject. In (6), it agrees with the feminine subject *?il-binit* in gender. The omission of the feminine *-t-* in *bitdzuuz*, for instance, will render the sentence in (6) ungrammatical.

- (6) *?il-binit* *bi*(t)dzuuz* *la-?ibin* *ħamm-ha*
 DEF-girl allowed.3SG.F to-son uncle-3SG.F.POSS
 ‘The girl is allowed to be married to her cousin.’

In contrast, the possibility-denoting modal auxiliary *bidzuuz* cannot act as the predicate of a sentence and does not get inflected for phi-features. Because of de-inflectionalization, it is invariably in masculine 3rd person singular form. In (7), for example, the lexical verb *tsaafir* ‘travel’ is the predicate of the sentence, not the modal verb *bidzuuz*. Further, *bidzuuz* cannot establish agreement with the subject. Instead, the main verb *tsaafir* carries out this task. It is marked as feminine to agree with the feminine subject.

- (7) *zeena* *bidzuuz* *tsaafir*
 Zeina may F-travel.3SG
 ‘Zeina may travel.’

The difference between the sentence in (6) and that in (7) also emphasizes that *bidzuuz* underwent syntactic reanalysis, which is one of the signs or sub-processes of grammaticalization (see Heine, 2003; Heine & Kuteva, 2007). In the present context, it means that when a lexical verb evolves into an auxiliary, it is raised to up from the lexical domain to the functional domain (e.g., little *v* or higher) in the syntactic structure, and therefore is expected to be morpho-syntactically invariable.

To wrap up, the previous discussion supports the directionality of the grammaticalization of *bidzuuz* from a lexical verb denoting permission to a possibility-denoting modal auxiliary.

Regarding *jimkin*, the current form of NRJA does not support its lexical nature, as *jimkin* with a lexical component does not (or no longer) exist in this variety. It cannot denote ability or permission. Instead, the passive participle form *mumkin*, which is derived from *jimkin*, can be used to denote permission. Consider the example in (8):

- (8) *mumkin* *tihki*
 allowed talk.2SG.M
 ‘You may talk.’

Notwithstanding the absence of clear synchronic evidence to the grammaticalization of possibility-denoting modal *jimkin* from an ability and permission-denoting source, this grammaticalization pathway is intuitive, as it has been observed in other languages, such as the evolution of the possibility-denoting modal *may* from ability-denoting *may* that first developed a new function, which is permission, before possibility in English. Further, the example in (8) asserts that the root *mkn* in NRJA involves the meaning of permission.

Similar to *bijuuz*, *jimkin* is an epistemic modal auxiliary, as it cannot act as the predicate in a sentence, cannot be inflected, and therefore it cannot establish agreement with the subject in phi-features. Consider the sentences in (9) where *jimkin* is inflectionally invariable although the subject is feminine singular in (9a) and masculine plural in (9b). Instead, the main verbs *tsaafir* and *ijsaafar-u* are the members that got inflected for number, person and gender to establish agreement with their subjects.

- (9) a. *zeena* *jimkin* *tsaafir*
 Zeina may F-travel.3SG
 ‘Zeina may travel.’
 b. *dziiraan-na* *jimkin* *ijsaafar-u*
 neighbours-1PL.POSS may travel.3PL.M
 ‘Our neighbours may travel.’

Based on the previous discussion, partial desemanticization unsurprisingly plays a role in the development of a permission-denoting verb into a possibility-denoting epistemic modal auxiliary in NRJA. To illustrate, both modal auxiliaries neutrally denote possibility. This neutrality springs from the meaning of the sources of these two modal auxiliaries which is permission. The meaning of permission of the source verbs developed into possibility in their modal counterparts and no lexical remainder is left to seep into the newly developed modal auxiliaries. This can be regarded as the partial transfer of some of the meaningful content of permission. When somebody is given the permission to do something, s/he is told that an action is possible. This means that permission entails possibility but not vice versa (i.e., permission embeds possibility). This entailment is yielded, as it cannot be imagined that the one who gives permission to do a certain action, believes that this action is impossible. This entailment asserts that part of the meaningful content of the lexical source is preserved in its modal. More specifically, possibility, which is a requirement of permission, is maintained in the modal.

Below, it is shown that partial semantic desemanticization has a deeper influence while grammaticalizing the modal auxiliaries *xaaf* and *laa jkuun* in NRJA. The rest of this section investigates the grammaticalization pathways of these two modal auxiliaries and their synchronic diagnostics and shows that possibility is not the only meaning that exists in these modal auxiliaries, as the former expresses worriedness and the latter expresses unlikelihood beside possibility. The significant role of desemanticization in the grammaticalization of these two modal auxiliaries lies in preserving some of the meaningful residues of the sources of these modals. Particularly, part of the meaning of fear of the source *xaaf* is preserved in the modal *xaaf*. The meaning of fear embeds worriedness but not vice versa. Likewise, part of the meaning of negation of the negative particle *laa* is maintained in the modal *laa jkuun*, as negation entails unlikelihood but not vice versa.

B. *Xaaf*

Since possibility-denoting *xaaf* has also a lexical counterpart, it is argued in this part that the lexical verb *xaaf* is grammaticalized into a modal verb in NRJA. Its grammaticalization pathway is *verb that means fear* → *possibility-denoting modal auxiliary*. It is worth highlighting that this pathway has not been previously reported in the literature on the grammaticalization of modal auxiliaries, to the best of the researcher's knowledge.

The mechanisms of the grammaticalization of the lexical *xaaf* into a modal auxiliary in NRJA are supported by synchronic evidence. It undergoes decategorization (and syntactic reanalysis), as the modal *xaaf* cannot act as the predicate nucleus of a phrase and cannot select arguments, unlike the lexical *xaaf*. In (10a), the lexical *xaaf* is the predicate and selects its external argument. On the contrary, the modal auxiliary *xaaf* in (10b) is not a predicate. Instead, the main verb *jigaʕ* in (10b) is the predicate. What also supports the decategorization of *xaaf* is that it lost its ability to get inflected. In (10a), the lexical *xaaf* is obligatorily inflected as feminine to agree with the feminine subject. In contrast, the modal auxiliary *xaaf* in (10b) does not exhibit any inflectional properties (i.e., it is maintained as it is), whereas the main verb *tigaʕ* is determined as feminine to agree with the feminine *ʔil-binit*.

- (10) a. *ʔumm-u bitxaaf ʔal-ee*
 mother.3SG.M.POSS fear.3SG.F on-3SG.M
 'His mother fears for him.'
 b. *xaaf tigaʕ ʔil-binit*
 may fall.3SG.F DEF-girl
 'The girl may fall, I am afraid.'

Another example on lexical *xaaf* and modal *xaaf* distinction is provided in (11). Speaker 1, the mother, in (11c) uses the modal auxiliary *xaaf* to show her worries that her son is not in a safe place. In this example, the modal *xaaf* does not establish full agreement with the subject (the speaker). In other words, the form of this modal auxiliary is invariable. It remains in 3rd person masculine form although the subject is feminine.

- (11) Context: a mother (Speaker 1) is afraid that her son is in danger. She is talking with one of her sons (Speaker 2):
 a. Speaker 1: *ween ʔaxuu-k ʔil-zʕayiiir*
 where brother-2SG.M DEF-little
 'Where is your younger brother?'
 b. Speaker 2: *maa baʕrif*
 NEG know.1SG
 'I do not know.'
 c. Speaker 1: *xaaf jruuħ ʕind ʔil-biir*
 feared.3SG.M go.3SG.M at DEF-well
 'He might go to the well!'

On the contrary, *xaaf* in (12) is a lexical verb, as it establishes full agreement in number, person and gender with the subject *ʔumm* 'mother' in (12a) and with *ʔahl* 'family' in (12b):

- (12) a. *ʔumm-i xaaf-at jruuħ ʕind ʔil-biir*
 Mother-3SG.POSS feared-3SG.F go.3SG.M at DEF-well
 'My mother is afraid that he might go to the well!'
 b. *ʔahl-i xaaf-u jruuħ ʕind ʔil-biir*
 family-3SG.POSS feared-3PL.M go.3SG.M at/near DEF-well
 'My family (members) are afraid that he might go to the well!'

The previous discussion implies that the possibility-denoting modal auxiliary *xaaf* is the grammaticalized form of the lexical verb *xaaf* 'fear'. It also emphasizes that the impact of partial desemanticization in developing the modal auxiliary *xaaf* is obvious, as it partially maintains the lexical meaning of fear in this modal, resulting in a possibility-denoting epistemic modal that expresses speaker's attitude of worriedness. What asserts that worriedness is a residue of the meaning of fear is that fear, which is a feeling, is expected to embed the feeling of worriedness. Fear entails the existence of worriedness but not vice versa. The mental state of being worried may lead to developing fear, maybe, because of overthinking, for example. Hence, worriedness could be an initial stage that can develop the feeling of fear. The opposite direction seems counterintuitive albeit possible, which is accidentally developing the feeling of fear, and then finding out the cause of this feeling and worrying about it.

C. *Laa Jkuun*

Another possibility-denoting modal auxiliary is *laa jkuun*. The pathway proposed for this auxiliary is *negation particle + copula* → *possibility-denoting modal auxiliary*. The negation particle *laa* is typically to denote negative imperatives in NRJA, as in *laa tihki* NEG. talk.2SG.M ‘Don’t talk!’ Concerning the copular *jkuun*, or any of its morphological variants, it occurs in equational sentences, as in (13).³

- (13) *ha ða ?iz-zalamah bikuun ?axuu?*
 This DEF-man is brother-1SG.POSS
 ‘This man is my brother.’

It should be noted at this point that the negative particle is a gram and the copula is closer to the grammatical domain than the lexical one. The lexical trace of the copula can be easily detected. The copula evolved from the existential verb *jkuun*, which is very similar to the existential verb *be* in English. This implies that the full version of the pathway above involves two stages, as follows: (1) *existential verb* → *copula* (2) *negative particle + copula* → *possibility-denoting modal auxiliary*.

Before presenting the morphosyntactic properties that support the grammaticalization of a modal auxiliary from the *negative particle + copula* sequence, the use of this possibility-denoting modal auxiliary is investigated. It is typically exploited when other alternatives (possibilities) have been suggested and all of them do not work (or do not fit). In other words, it is used when the suggested alternative or possibility is unlikely (off the table). Consider the example in (14) where a husband asks his wife about the keys. In (14b), she uses *bidzuuz* to suggest the first possible alternative (i.e., place) where the husband may find his keys, which are *on the table*. In (14d), she offers another alternative, which is *on T.V*. Finally, she uses *laa jkuun* to suggest the unlikely alternative: *leaving the keys in the door lock*. This alternative is the one that does not pop up early in the speaker’s mind.

(14) Context: A husband (Speaker 1) asks his wife (Speaker 2) about the keys.

- a. speaker 1: *hada faaf ?il-mafaatiih*
 one saw.3SGM DEF-keys
 ‘Did anybody see the keys?’
- b. Speaker 2: *bidzuuz ?-at-?aawleh*
 may on-DEF-table
 ‘It may be on the table.’
- c. Speaker 1: *laa, mi? ?-at-?aawleh*
 NEG, not on-DEF-table
 ‘No, it is not on the table.’
- d. Speaker 2: *?ab fuufuh foog it-tilfizjoon*
 ok see over DEF-T.V
 ‘Then, check whether it is on T.V.’
- e. Speaker 1: *wa-la foog it-tilfizjoon*
 and-NEG. over DEF-T.V
 ‘It is not even on T.V.’
- f. Speaker 2: *laa jkuun b-il-baab*
 NEG. be.3SGM in-DEF-door
 ‘May be, you left the keys in the door lock.’

Another context where *laa jkuun* indicates that a certain possibility is weak or unlikely to happen is in (15). Speaker 1 in (15a) is wondering what happened to his friend, Sami. Speaker 2 in (15b) uses *bidzuuz* to show that it is possible that Sami is sick, and Speaker 3 excludes this possibility in (15c). In (15d), Speaker 1 suggests an unlikely possibility.

- (15) a. Speaker 1: *maa bafuuf sami b-il-dzam?ah*
 NEG. see.1SG Sami in-DEF-university
 ‘I do not see Sami at school these days.’
- b. Speaker 2: *bidzuuz inn-o marii?*
 may COMP.-3SG.M sick
 ‘He may be sick.’
- c. Speaker 3: *laa, maa ?atwaqqa? mbaarih lamahtu b-il-balad*
 NEG, NEG expect.1SG yesterday glimpsed-3SG.M in-DEF-town
 ‘I do not think so. I glimpsed him downtown yesterday.’
- d. Speaker 1: *laa jkuun tarak ?il-dzam?ah*
 NEG. be.3SG.M.PRES left.3SG.M DEF-university
 ‘He may have left school.’

Consider the third example provided in (16). The interlocutors think that the proposition that *their friend will pass Tawjihi* (secondary school exams) is not expected (or not even possible). Therefore, Speaker 2 uses *laa jkuun* to express his astonishment towards the possibility that their friend has passed his exams.

³ The copular operator in predicational sentences in NRJA is typically null.

- (16) a. speaker 1: *fii hafleh bi-daar s'aahib-na*
 there party in-house friend-1PL
 'They have a party in our friend's house.'
 b. Speaker 2: *laa jkuun nidzih b-it-tawdzihi*
 may succeeded.3SG.M in-DEF-Tawjihi
 'He may have passed Tawjihi!'

Hence, the use of *laa jkuun* in contexts where propositions are expected to be true or when actions or events are predicted to occur (or have occurred), is semantically awkward. For example, if passing Tawjihi is expected in (16), the use of *laa jkuun* is meaningfully odd.

Back to morphosyntactic evidence, what argues with the grammaticalization of the modal *laa jkuun* in NRJA is the decategorization of the copula *jkuun*. For example, *jkuun* in (16b) is not copular, as it is followed by the main verb *nidzih*. This means that *jkuun* does not link between two referring expressions in an equational sentence. Therefore, *laa jkuun* is a possibility-denoting modal expression in (16b). However, the decategorization of the copular verb is not paired with obligatory de-inflectionalization: the modal *laa jkuun* is optionally inflectionally sensitive. As shown in (17), it is optional that the modal *laa jkuun* agrees with the semantic features of the subject. This implies that the grammaticalization of the modal auxiliary *laa jkuun* has not reached the endpoint of the pathway yet, which is reached by obligatorification (see Lehmann, 1995). Specifically, the inflectionally invariable form *laa jkuun* is not yet the obligatory form of this modal auxiliary.

- (17) a. *laa jkuun badd-ha t-saafir*
 AUX want-3SG.F 3SG.F-travel
 b. *laa tkuun badd-ha tsaafir*
 AUX.F want-3SG.F 3SG.F-travel
 'She may want to travel.'

To wrap up, the grammaticalized *laa jkuun* is possibility-denoting modal auxiliary that expresses the speaker's attitude of the unlikelihood of the truth of a certain proposition or the occurrence of an event or action (i.e., weak possibility).⁴ Similar to the modal *xaaf*, the case of *laa jkuun* points to the importance of partial desemanticization in the development of a modal auxiliary with a specific semantic extension. It indicates that the speaker is suspicious and thinks that the truth condition of a proposition or the occurrence of an event is unlikely. This is more likely inherited from the meaning of negation in the source of this modal. To illustrate, the negative meaning of the particle *laa* is partially shipped to the developed modal auxiliary *laa jkuun*. This is obvious in the developed modal as it weakly attempts to negate the truth of a proposition or the occurrence of an event.⁵ This means that the strong negation function of the negative particle *laa* is weakened by partial desemanticization in the developed modal *laa jkuun*. Thus, the meaning of unlikelihood of the modal *laa jkuun* is derived from the meaning of negation.

IV. CONCLUSION

This paper has proposed that NRJA has possibility-denoting epistemic modality comprising the following auxiliaries: *bidzuuz*, *jimkin*, *xaaf* and *laa jkuun*. It has also highlighted the importance of partial desemanticization as the factor that determines the variation in the use of these modal auxiliaries. Specifically, *bidzuuz* and *jimkin* are neutrally exploited to express possibility. This neutrality springs from the meaning of the sources of these two modal auxiliaries which is permission. The meaning of permission in the source verbs developed into possibility in their modal counterparts and no lexical remainder is left to seep into the newly developed modal auxiliaries. This can be regarded as the partial transfer of some of the meaningful content of permission. When somebody is given permission to do something, s/he is told that an action is possible. Thus, possibility is embedded in permission (i.e., it is one of its prerequisites). Concerning the other two modals, they have other meaningful extensions beside possibility. *xaaf* expresses speaker's worriedness and *laa jkuun* indicates the unlikelihood of the truth of a proposition or the occurrence of an event. It has been demonstrated that this variation in the use of these two modals is a consequence of maintaining some of the meaning of the source words in these modals. The meaning of fear is partially preserved in the modal *xaaf* which expresses worriedness, and the meaning of negation is also partially maintained in the modal *laa jkuun* which expresses unlikelihood. Worriedness can be reinterpreted as the cause, the initial stage, or a weak form of fear. Likewise, unlikelihood can be reinterpreted as the weak form of the negation of the truth of a proposition or the occurrence of an event.

⁴ Interestingly, none of the previously introduced modal auxiliaries in JA undergoes phonetic reduction, which is one of the mechanisms that could be taken as phonetic evidence to grammaticalization.

⁵ It is worth noting here that this variety has another possibility-denoting modal which is *belki*. It has the semantic extension of hopefulness (i.e., the speaker uses it to express his hopefulness that a certain proposition is true or an event occurs or occurred). However, this modal is out of the scope of this study, as it is commonly believed that it is a loan word from Turkish.

APPENDIX

TABLE 1
FIVE CONTEXTLESS CONVERSATIONAL TURNS EMBEDDING *Bidzuuz*

1.	<p>Speaker 1: <i>mif' faajif' hada b-il-beet</i> NEG see.GER one in-DEF-house 'I see no one in our house.'</p> <p>Speaker 2: <i>bidzuuz rawwahu</i> may left-3PL.M 'They maybe, left.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
2.	<p>Speaker 1: <i>ween ?il-miftaah</i> where DEF-key 'Where is the key?'</p> <p>Speaker 2: <i>bidzuuz jkuun b-il-baab</i> may be.3SG.M in-DEF-door 'It maybe in the door.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
3.	<p>Speaker 1: <i>hada faaf' ?ali</i> one saw.3SGM Ali 'Did anyone see Ali?'</p> <p>Speaker 2: <i>bidzuuz ?ilf'</i> may left.3SG.M 'He may have left.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
4.	<p>Speaker 1: <i>miin rah' j?all' hoon</i> who will stay.3SG.M here 'who will stay here?'</p> <p>Speaker 2: <i>bidzuuz ihmad j?all'</i> may Ahmad stay.3SG.M 'Ahmad may stay.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
5.	<p>Speaker 1: <i>mata rah' tii'la? ?il-?alaamaat</i> when will F.show up DEF-marks 'When will the marks appear?'</p> <p>Speaker 2: <i>bidzuuz t-i'la? il-joom</i> may F-show-up DEF-today (a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>

TABLE 2
FIVE CONTEXTLESS CONVERSATIONAL TURNS EMBEDDING *Jimkin*

1.	<p>Speaker 1: <i>mif faajif hada b-il-beet</i> neg see.GER one in-DEF-house 'I see no one in our house.'</p> <p>Speaker 2: <i>jimkin rawwahu</i> may left-3PL.M 'They may be, left.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
2.	<p>Speaker 1: <i>ween ?il-miftaah</i> where DEF-key 'Where is the key?'</p> <p>Speaker 2: <i>jimkin jkuun b-il-baab</i> may be.3SG.M in-DEF-door 'It may be in the door.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
3.	<p>Speaker 1: <i>hada faaf ?ali</i> one saw.3SGM Ali 'Did anyone see Ali?'</p> <p>Speaker 2: <i>jimkin t'il?</i> may left.3SG.M 'He may have left.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
4.	<p>Speaker 1: <i>min rah j?all hoon</i> who will stay.3SG.M here 'who will stay here?'</p> <p>Speaker 2: <i>jimkin ihmad j?all</i> may Ahmad stay.3SG.M 'Ahmad may stay.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
5.	<p>Speaker 1: <i>mata rah t'il?as ?il-?alaamaat</i> when will F.show up DEF-marks 'When will the marks appear?'</p> <p>Speaker 2: <i>jimkin t-il?as il-joom</i> may F-show-up DEF-today 'They may appear today.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>

TABLE 3
FIVE CONTEXTLESS CONVERSATIONAL TURNS EMBEDDING *Xaaf*

1.	<p>Speaker 1: <i>mif faajif hada b-il-beet</i> NEG see.GER one in-DEF-house 'I see no one in our house.'</p> <p>Speaker 2: <i>xaaf rawwahu-u</i> may left-3PL.M 'They may be, left.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
2.	<p>Speaker 1: <i>ween ?il-miftaah</i> where DEF-key 'Where is the key?'</p> <p>Speaker 2: <i>xaaf jkuun b-il-baab</i> may be.3SG.M in-DEF-door 'It may be in the door.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
3.	<p>Speaker 1: <i>hada faaf ?ali</i> one saw.3SGM Ali 'Did anyone see Ali?'</p> <p>Speaker 2: <i>xaaf t'ilf</i> may left.3SG.M 'they may have left.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
4.	<p>Speaker 1: <i>min rah jð'all hoon</i> who will stay.3SG.M here 'who will stay here?'</p> <p>Speaker 2: <i>xaaf ihmad jð'all</i> may Ahmad stay.3SG.M 'Ahmad may stay.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
5.	<p>Speaker 1: <i>mata rah t'il'la? ?il-?alaamaat</i> when will F.show up DEF-marks 'When will the marks appear?'</p> <p>Speaker 2: <i>xaaf t-it'la? il-joom</i> may F-show-up DEF-today 'They may appear today.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>

TABLE 4
FIVE CONTEXTLESS CONVERSATIONAL TURNS EMBEDDING *Laa Jkuun*

1.	<p>Speaker 1: <i>mif faajif hada b-il-beet</i> NEG see.GER one in-DEF-house 'I see no one in our house.'</p> <p>Speaker 2: <i>xaafrawwahu</i> may left-3PL.M 'They may be, left.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
2.	<p>Speaker 1: <i>ween ?il-miftaah</i> where DEF-key 'Where is the key?'</p> <p>Speaker 2: <i>xaaf jkuun b-il-baab</i> may be.3SG.M in-DEF-door 'It may be in the door.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>
3.	<p>Speaker 1: <i>hada faaf ?ali</i> one saw.3SGM Ali 'Did anyone see Ali?'</p> <p>Speaker 2: <i>xaaf ?il?</i> may left.3SG.M 'He may have left.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
4.	<p>Speaker 1: <i>miin rah j?all hoon</i> who will stay.3SG.M here 'who will stay here?'</p> <p>Speaker 2: <i>xaaf ihmada j?all</i> may Ahmad stay.3SG.M 'Ahmad may stay.'</p> <p>(a) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (b) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely. (c) It is possible that people left, and the speaker hopes that the event has occurred.</p>
5.	<p>Speaker 1: <i>mata rah tir'la? ?il-?alaamaat</i> when will F.show up DEF-marks 'When will the marks appear?'</p> <p>Speaker 2: <i>xaaf tir'la? il-joom</i> may F-show-up DEF-today 'They may appear today.'</p> <p>(a) It is possible that people left. (b) It is possible that people left, and the speaker is trying to show her worriedness that the event has happened. (c) It is possible that people left, but the speaker thinks the occurrence of the event of leaving is unlikely.</p>

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