Diachronic Cognitive Studies of Modality, Tense, and Aspect: A Systematic Review

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Abstract

Grammaticalization is a challenging topic in the study of historical semantics. The aim of this paper is to provide a systematic review of all publications (i.e., journal articles, chapters, books, and dissertations) which study grammaticalization within a cognitive semantic framework. It seeks to offer an exhaustive summary of the literature and to appraise it critically for the purpose of identifying how words get grammaticalized and begin to express modality, tense, and aspect.

Keywords: Diachronic semantics, Cognitive semantics, Grammaticalization, Modality, Tense and aspect

1. Introduction

It is intriguing to study the development of grammatical markers. This type of semantic change which is called grammaticalization (also known as grammaticization) is concerned with how a lexical item with specific content meaning becomes, through time, interpreted as a grammatical item. Grammaticalization can be defined as a process "whereby lexical items

and constructions come in certain linguistic contexts to serve grammatical functions" (Hopper and Traugott, 2003: xv). Thus, one can safely say that grammaticalization is a process that directs a concept from its open-class category towards a closed- class category. To discuss grammaticalization issues, one should make a distinction between primary and secondary grammaticalization. The former refers to the initial stage of semantic change in which a grammatical status of a concept is developed out of its contentful reading, whilst, the latter indicates a second stage of semantic change in which a grammatical item, which is already grammaticalized, acquires more grammatical functions (Traugott, 2010).

According to Hopper and Traugott (2003), the term grammaticalization was first coined by the French linguist Antoine Meillet (1912) in his article "L´évolution des Formes Grammaticales" (i.e., "The Evolution of Grammatical Forms"). At that time, the study of grammaticalization and historical linguistics in general was popular. However, the study of grammaticalization soon became old-fashioned, especially with the advent of the structuralist approach, which dismissed diachronic in favor of synchronic studies. Grammaticalization continued to be marginalized by the generativists who developed formal methods to account for how a fluent speaker, at a particular point in time, forms a constituent meaning out of a set of lexical meanings (Katz and Fodor, 1963).

It was not until the development of cognitive science that the study of historical semantics would be brought to the fore again. Since then, there has been growing interest in the study of grammaticalization. Consequently, a number of comprehensive studies have been undertaken to investigate issues that relate to modality, tense, and aspect, all aiming to identify grammaticalization pathways and the mechanisms by the means of which a grammatical function may emerge. They used a variety of theoretical constructs: Metaphor, metonymy, subjectification, etc.

In this paper, we study the cognitive semantic literature on the development of grammaticalization and focus on English modal verbs, tense, and aspect. Our purpose, in this systematic review, is twofold: First, we aim to offer exhaustive summaries of the publications that discuss the grammaticalization process of modality, tense, and aspectuality so that ideas regarding the semantic pathways, the cognitive mechanisms involved in this process, and the evidence used in support will become clear. Second, we seek to appraise this literature for the purpose of identifying research gaps that the research community may have to target.

The rest of the paper is organized as follow: Section 2 explains in detail the literature search protocol. Section 3 defines the terms that occur often in this paper. Section 4 offers a review and a critique of the literature. Section 5 outlines the research gaps and presents some recommendations for further research.

2. Planning the Review

To identify relevant literature, we developed a systematic protocol that demonstrates rigor in the search process. The protocol starts from the research questions that this review seeks to answer, which in turn determine the query terms, the databases to use, the fields to search within, and the literature assessment criteria to follow.

2.1 Research Questions

1   How do English grammatical markers of modality, tense, and aspectuality develop?

2   What kinds of words are more prone to grammaticalization?

3   How is the grammaticalization of modality, tense, and aspect accounted for in cognitive semantics?

2.2 Keywords

To conduct our systematic review, it is essential to settle on some keywords to use in our search queries. These keywords must capture the field of interest, which is Cognitive Linguistics but that is too vast a topic. So, it has to be narrowed down by Semantics, but even then this is too broad. Since we are interested in meaning change, it is pertinent to restrict the topic further by Diachrony. We decided that the keywords should be: 'cognitive', 'semantic', and 'diachronic', together with alternative terms that the community of linguists uses. We added: 'historical', as it is sometimes used in place of 'diachronic'.

2.3 Databases

To extract all publications in this field, six electronic databases were used: (1) Ebsco Discovery Services; (2) ProQuest; (3) ScienceDirect; (4) SpringerLink; (5) Scopus; and (6) Ebrary EBooks. These are all the databases accessible through our electronic library that cover language and linguistics. They index journal articles, chapters, books, and theses. To search within these databases, we used the advanced search facility to confine results to the relevant only. Within each database a set of specific limiters are used (see Table 1 below):

Table 1. Search limiters for each database

Databases	Search limiters
Ebsco Discovery Services	Full text, peer reviewed, all document types, all dates, all languages, all source types
Pro Quest	Full text, peer reviewed, all document types, all dates, all languages, all source types
Science Direct	All journals, all books, and all dates
Springer Link	Linguistics, all document types, all dates, all languages
Scopus	Arts and humanities, all document types, all source titles, keywords (semantics, grammaticalization, semantic change, polysemy, diahcrony, cognitive grammar, conceptual metaphor, embodiment, lexical semantics, conceptualization, language change, concept formation, grammaticalisation) and English and French languages
Ebrary E-Books	Language and linguistics, English and French languages

2.4 Query Terms

Because search queries are responsible for the number of returned results, all possible combinations of the keywords were considered and the ones used in the literature were adopted. Therefore, the keywords used in our search queries were: 'historical semantics', 'diachronic semantics', 'cognitive semantics', 'historical cognitive semantics', 'cognitive historical semantics', 'diachronic cognitive semantics', and 'cognitive diachronic semantics'. This set permits casting our net wide without preventing further topic refinement.

The advanced search facilities in the six databases are not identical. Some allow Boolean operators; others do not. In EbscoDiscovery Services; ProQuest; and ScienceDirect databases, we used the following search queries: 'cognitive diachronic semantics'; 'diachronic cognitive semantics'; 'cognitive historical semantics'; and 'historical cognitive semantics'. As for SpringerLink database, we used the same search queries that we used to search within the previous databases, but we added two other terms: 'cognitive semantics' and 'historical semantics'. To search within Scopus, however, we used a complex query with Boolean operators and nesting: 'cognitive AND (diachronic OR historical) AND semantics'. Ebrary search facility is more restrictive, so we used a general search query: 'cognitive semantics'.

2.5 The Field to Search in

After developing the search queries, the next decision was to agree on suitable fields to search in. To make sure that the search results are relevant we chose to look for the search queries in 'titles'' 'keywords'' and 'abstracts'. As the Advanced Search facilities of the six databases are not identical, we were able to search in these three fields in only Ebsco Discovery Services'; ProQuest; ScienceDirect; and Scopus. In SpringerLink, however, we looked for our search terms using the limiters: 'where the title contains' and 'with all of the words'. As for Ebrary, we had to look for our search terms in 'keyword and full text' because this was the only option with promising results.

2.6 Conducting the Search

Our systematic review was conducted on 30.01.2018. We searched in the six databases, one by one, in the manner described, then saved the results of each data source separately. Subsequently, all results were merged together in one database of our own with tags that identified the datasources. Table 2 below summarizes the number of results obtained from each datasource.

Table 2. Number of results per query and database

Database	Query terms	The number of the results
EbscoDiscovery Services	Cognitive diachronic semantics/ diachronic cognitive semantics	47
	Cognitive historical semantics/ historical cognitive semantics	124
ProQuest	Cognitive diachronic semantics/ diachronic cognitive semantics	2

	Cognitive historical semantics/ historical cognitive semantics	6
ScienceDirect	Cognitive diachrocnic semantics/ diachronic cognitive semantics	4
	Cognitive historical semantics/ historical cognitive semantics	4
SpringerLink	Cognitive diachrocnic semantics/ diachronic cognitive semantics	346
	Cognitive historical semantics/ historical cognitive semantics	882
	Cognitive semantics	7
	Historical semantics	3
Scopus	cognitive AND (diachronic OR historical) AND semantics	500
Ebrary E-Books	Cognitive semantics	707

2.7 Selection of References

Using our search terms returned some results that are irrelevant; this is probably due to finding the search terms in abstracts in Ebsco Discovery Services; ProQuest; ScienceDirect; and Scopus, and in full text in Ebrary. Thus, to assess the relevance of the search results, we developed a set of criteria in the light of the research questions that guided the decision whether to include or exclude a particular publication. To check the search results against the inclusion/ exclusion criteria, we had to read the abstracts and in some case the full-text publications. The following are the criteria for inclusion or exclusion of a publication:

1. Focus of the study is on 'cognitive (diachronic OR historical) semantics'.

2. It must be written in English.

3. The investigated language must be English, French, or Arabic, the languages spoken competently by the researchers.

Thus, publications which met one of the following criteria were excluded from the systematic review:

1. A study that does not deal with semantic change.

2. It does not investigate diachronic change.

3. It does not use the cognitive semantic approach.

4. It reviews other studies or books.

5. It mentions one of the search terms but does not take it as a focus.

6. It is not written in English.

7. It does not investigate English, French, or Arabic.

The inclusion/exclusion criteria removed numerous irrelevant publications. They brought down the number of publications to be reviewed from 2632 to 276.

2.7.1 Excluded Results

More than 69% of the returned publications (i.e., 1649 results) discussed issues other than 'semantic change'. They discussed morphological change, syntactic change, phonological change, etc. Moreover, 24.96% (i.e., 588 results) were removed because either they were not written in English or they did not study English, French, or Arabic, the languages that we are competent in. Furthermore, 2.72 % (i.e., 64 results) were eliminated because either they did not investigate 'diachronic change' or did not adopt a 'cognitive approach'. Additionally, 2.33 % (i.e., 55 publications) were excluded because they were merely abstracts; introductions; bibliographies; glossaries; key-terms; and book reviews.

2.7.2 Included Results

After eliminating 2356 results, the rest publications whose total number is 276 were carefully checked to remove any duplicated study that might appear in more than one database. Thirty duplicate studies were deleted. Consequently, the number of included publications dropped down to 246.

Included publications were then scrutinized to determine the investigated themes. It was found out that publications fell into these themes: Categorization; conceptual mechanisms; conceptual theories; grammaticalization; diachronic pragmatics; and cognitive approach. Table 3 below shows the number of search results in each theme.

Table 3. Number of publications in each theme

Theme	The number of the results
Categorization	20
Conceptual mechanisms	52
Conceptual theories	5
Grammaticalization	110
Diachronic pragmatics	16
Cognitive approach	43
Total	246

After categorizing the search results into various theme groups, we chose to focus on one specific theme which is grammaticalization. As table 3 above reveals, the number of search results that dealt with grammaticalization is 110. To reduce these further, we read each of their abstracts and determined what aspect of grammaticalization each publication studied. It was discovered that only 18 publications were focused on the grammaticalization of modal verbs, tense, or aspect. These publications are what this survey will cover.

3. Definition of Terms

At the start, let's define the core terms that will recur here.

Modality is a speaker's attitude towards the proposition in an utterance. It is a pledge as to the truth of the proposition, certainty, feasibility, necessity, and permissibility. It may be expressed lexically or grammatically, by verbal inflections or particles (modals). There are two types of modality: Epistemic and deontic. In the first, the speaker expresses their position on how certain or how doubtful, how possible or impossible, a proposition may be (e.g., Vacations in winter must have been legal then.). In the second, the speaker expresses the degree of obligatoriness, permissibility, or prohibition that the proposition is subject to (e.g., the vacation must be taken before winter). Deontic modal is also called root modal.

Tense is a grammatical category wherewith the time of a state or event is expressed in relation to a reference point in time, often the speaking time.

Aspect is a term that denotes the internal composition of an event and how it unfolds in time. It is the specification of whether or not an event (a) consists of phases (process vs. non-process verbs); (b) has a terminal point (accomplishment vs. activity); (c) is predicated for single moments of time (achievement vs. states).

Auxiliary is a particle or verb that accompanies the main verb and performs a grammatical function such as the expression of modality, mood, voice, tense, aspect, person, or number. Some auxiliaries are called modals because they mark the modality of a proposition.

Models are auxiliaries that mark the modality of a proposition. Their function is to express a speaker's attitude towards their proposition in relation to a scale from possibility to necessity.

4. The Review

The current review covers a total of 18 studies that approached the grammaticalization of modality, tense, and aspect from a cognitive diachronic perspective. This is the sum of studies published from the earliest times covered by the library databases until the beginning of 2018. In the following sections, we will discuss the grammaticalization of these three facets of meaning: Modality, tense, and aspect.

4.1 Modality

There are 12 studies that approached the grammaticalization of modality diachronically and that used cognitive semantics as a frame of reference. They are all concerned with modals in English. They adopted the metaphorical approach (two studies reviewed in section 4.1.1); the metonymic inferencing approach (five studies reviewed in section 4.1.2); or other approaches (five studies reviewed in section 4.1.3). A critique will follow each review.

4.1.1 The Metaphorical Approach

It appears, according to the databases used for this survey, that Sweetser (1984) is the earliest study to address the grammaticalization of modality. In her Ph.D thesis, Sweetser, proposed a new cognitive model that accounts for semantic change and polysemy relations in four semantic areas namely verbs of perceptions; modal verbs; conjunctions; and if-then conditionals. This new model is based on a systematic metaphorical extension, With regard to modality, Sweetser proposed a force dynamic analysis to account for both deontic and

epistemic modals. In the case of the first type of modality, this force dynamic analysis takes the form of socio-physical forces and barriers that occur in the real world. Whilst in the second type, it is a metaphorical extension of these socio-physical forces and barriers into the mental world. The role of socio-physical forces in structuring both root and epistemic modals can be seen in 'must'. Sweetser (1984: 62) stated that the deontic meaning of 'must'can be defined as "a compelling force directing the subject towards an act". Thus, an utterance such as 'you must go now' suggests that there is a direct force (social and/or physical) that compels the addressee to go now. This socio-physical force can be used to structure metaphorically 'must''s epistemic meaning. In this metaphorical structure, a socio-physical force in the external world is mapped into speakers' premises in the mental world. In an utterance such as 'she must be pretty', it is a speaker' premises that compel him/her to conclude that she is pretty.

As for socio-physical barriers, Sweetser claimed that they are involved in the structure of other deontic modal such as 'may'. From her viewpoint, 'may''s root meaning denotes "an absent potential barrier in the socio-physical world" (1984:74). For instance, the utterance 'Tom may go' can be interpreted as indicating that there is no social and/or physical barrier which prevents Tom from going. This social and/or physical barrier can function as a source domain which is mapped onto premises in the speaker's mind to construct metaphorically 'may''s target domain of epistemicity. For example, the utterance 'he may be the postman' points out that there is no premise, among the set of premises available to a speaker, which bares him/ her to conclude that the person referred to is the postman.

The force dynamic process offered by Sweetser is of great significance because it can be used to describe the deontic and epistemic meaning of present day English modal markers. However, this does not mean that her system is not without problems. Sweetser claimed that epistemic modality emerges from deontic modality as a result of a metaphorical extension of socio-physical forces and barriers. Her claims are based on no empirical study. Sweetser analyzed present day uses of English modal markers. She did not provide evidence from different synchronic stages to show how social-physical forces and barriers can structure metaphorically English epistemic modals.

Sweetser's force dynamic process was challenged by Pelyvás (2012) who thought that the metaphorical extension system that Sweetser (1984) introduced to analyze English modals is problematic and, thus, proposed a more systematic process to account for English modals. Pelyvás (2012: 247) explicitly stated that "the differences between root and epistemic meanings are greater than envisaged by Sweetser". To show the problems of Sweetser's analysis, Pelyvás reexamined the two English modal may and must. From Pelyvás's viewpoint the image schema that Sweetser proposed to define the deontic meaning of may can not be used as a source domain from which an epistemic sense of may is metaphorically extended. This is mainly because of three points. First, the sociophysical barrier does not include the essential features involved in the process of the metaphorical extension. In Sweetser's analysis, may's deontic meaning indicates "an epistemically unqualified statement" (Pelyvás, 2012: 235). The utterance 'Tom may go' can be interpreted as describing a situation that can be true or not. It seems that 'may''s deontic meaning, just like the epistemic meaning, describes a hypothetical statement. Since they express the same reading, the process of metaphorical extension from

deontic domain to epistemic domain appears to be invalid. Second the sociophysical barrier fails to account for the scopes of negation in the two domains. 'May' and 'may not' in the deontic domain indicate an opposed meaning to each other. 'Tom may go' contradicts with 'Tom may not go'. However, may and may not in the epistemic domain can occur together without resulting in contradictory statements: The utterance 'Tom may be there' suggests that Tom may not be there. Thus, explaining how 'epistemic may not' is arrived at from 'deontic may' seems to be very difficult. Third, speaker and doer roles are not consistent in the two domains: Speakers in deontic domains are extended into doers in the epistemic domain. In the utterance 'Tom may go', one can identify both a speaker and a doer. The former refers to the permission giver, while the latter refers to the entity that performs the action, i.e., Tom. However, the utterance 'he may be the postman' involves only a doer role. It is clear that in Sweetser's analysis of may, there is no consistency between the source domain and the target domain. This violates the Invariance Hypothesis which states that metaphorical mapping should preserve structural relationships in the two domains.

To overcome these problems, Pelyvás offered an alternative analysis in which he replaced Sweetser' term of sociophysical barriers with "counteracting forces of different relative strength" (Pelyvás, 2012: 238). Besides, he brought 'may''s obsolete meaning of ability into focus. In this sense of ability, one can find both a doer and a speaker. The doer is an entity which is to some extent capable of performing an action. A speaker is an entity that puts a situation into ground (.i.e., relating a situation to time and place of the utterance). So, it seems that the doer and the counteracting forces are part of the objective scene, but the speaker is not. Pelyvás claimed that both 'may''s deontic and epistemic readings are extended from the same ability meaning. In the case of deontic meaning, the counteracting forces are extended into a permission giver (i.e., a speaker). It appears that putting the speaker into the objective scene as a counteracting force is what results in the emergence of the deontic meaning of 'may'. In the case of epistemic meaning, the process of subjectification occurs. This process takes 'may''s ability meaning as a starting point and highlights the speaker (it hides the doer at the same time) and integrates it into the scope of prediction.

Regarding 'must', Pelyvás argued that Sweeter's sociophysical force analysis does not clearly specify the features of deontic meaning. This results in confusing interpretations between deontic and epistemic readings. Though the utterance 'Tom must go' expresses a deontic meaning (i.e, obligation); one can interpret it as indicating an epistemic interpretation (i.e., hypothetical statement). Furthermore, it fails to preserve the consistency of the doer and the speaker roles in the two domains (speakers in the deontic domain are extended into doers in the epistemic domain). To solve these problems, Pelyvás suggested that it is necessary to add a new element in 'must''s deontic reading which is proposed by Sweetser, namely "the doer's reluctant to perform the action" (Pelyvás, 2012: 243). This new element, from Pelyvás' viewpoint, prevents the confusion between deontic and epistemic must by providing a clear description of the deontic domain. Thus, in Pelyvás' analysis of deontic must, two forces can be identified. The first force represents the speaker's intention to get the addressee to perform an action. The second force represents the doer's counterforce which is in opposition to the force representing the speaker's intention. It is worth mentioning that in addition to the role of

an imposer, a speaker in this image schema performs the role of a conceptualizer. According to Pelyvás, this image schema is metaphorically extended to structure epistemic must. In this metaphorical structure, only the role of the speaker as a conceptualizer is highlighted and integrated in the scope of prediction, other roles, including the doer role and imposer role of the speaker, are hided. The doer's reluctant force is mapped onto unknown realities that make the speaker's proposition uncertain. The speaker' intention force is extended into known elements that make the speaker's position a prediction of reality.

Pelyvás' analysis of 'may' and 'must' is significant because it shows some problems in Sweetser's analysis. However, there are some limitations in his study that need to be highlighted. Pelyvás claimed that both deontic and epistemic readings of 'may' emerge from an ability meaning. He also claimed that 'deontic must' gives rise to 'epistemic must'. His claims can not be verified unless a historical investigation is carried out. Moreover, in his proposed image schema of 'deontic must', Pelyvás' assumed that the compelling force takes the form of speaker's intention and neglected that social norms can compel the addressee to perform an action. Besides, it seems that the metaphorical extension process proposed by Pelyvás to account for epistemic must raises some doubts about the validity of his system. On the one hand, Pelyvás suggested that the imposer and the doer do not enter the metaphorical mapping; on the other hand, he said that their forces are interpreted, in the epistemic world, as known elements and unknown realities respectively. The last point that may be raised here about this study is that Pelyvás' did not provide enough details to show how the epistemic domain of 'may' and 'must' is metaphorically structured. All what he said is that the role of the conceptualizer is highlighted and integrated in the scope of the prediction, but he did not explain how and why this happened.

4.1.2 The Metonymic Inferencing Approach

The metaphorical shift hypothesis proposed by Sweetser has been strongly criticized by Goossens (1999). He said that "there is no evidence that there was at any given point in the development of English must a single conceptual shift whereby an element from the sociophysical domain was mapped onto the epistemic domain" (Goossens 1999: 208), and, thus, offered his inferencing view as an alternative. Goossens argued that metonymic inferencing is critical to the semantic change of English modal markers. In his study, Goossens tracked the semantic development of must from Old English to Modern English by looking at the several uses of must in the Helsinki Corpus of English texts which is a diachronic corpus. Besides, he used three contemporary Corpora: Brown; Lancaster-Oslo-Bergen (LOB); and London-Lund (LOLU). The data obtained were classified with regard to 'must''s uses into five categories: Deontic/necessity uses; inferable necessity uses; transitional uses; subjective epistemic uses; and undecidable uses. The results of his study revealed that the epistemic model is not directly derived from the deontic model by the means of metaphor; instead, it is the result of a set of gradual shifts. Goossens showed that the starting point of the epistemic interpretation is the deontic meaning. In Middle English, must was used with two predominate readings namely obligation and general necessity. This latter gave birth to new meaning of inferable necessity or objective epistemicy. This new meaning is the outcome of environmental contexts: In Early Modern English, must with general necessity meaning was

occurred in constructions which include linguistic elements of reasoning such as 'nedes','needes', 'he knoweth', 'by good reason', etc. Associating must with these linguistic elements gave rise to metonymic inferences based on which must became interpreted as indicting objective conclusions. Over time, a shift towards more subjective epistemic readings took place. These subjective uses are arrived at via the process of subjectification: Speakers started using must to express subjective conclusions instead of objective ones. The increase in these subjectified uses helped to establish the subjective epistemic meaning as a conventional meaning. Goossens hypothesized that this process can be used to account for other modal verbs in various languages.

It seems that the linguistic elements, such as the ones mentioned above, are clear evidence against Sweetser' force dynamic process. The data presented by Goossens suggests that 'must''s epistemic reading is not directly derived from the deontic reading by the means of a metaphorical extension of social and/or physical forces. If this is the case, then one would suppose that, in the history of 'must', there are no constructions in which must co-exists with elements of reasoning. To put it in other word, if speakers use socio-physical forces to construct metaphorically epistemic interpretations, then there is no need to use must with elements expressing epistemicy. Actually, this study offers empirical evidence against Sweetser's force dynamic system and brings into forth metonymic inferencing as the only essential mechanisms in the emergence of epistemic must. It is worth mentioning here that despite his empirical evidence; Goossens did not explain in detail the role of subjectification in establishing the subjective epistemic meaning of 'must'.

In much more thinking with Goossens (1999), Ziegeler (2003) acknowledged the role of metonymic inferencing in the semantic development of English modals, especially in the development of counterfactual implicatures (i.e., non-actuality interpretations). Ziegeler explored how English modals and semi modals that express past ability give rise to counterfactual interpretations through the process of metonymy. She explored how an utterance such as 'John was able to solve the problem' comes to mean John did not solve the problem despite his ability to do so. To conduct this research, Ziegeler traced diachronically, using the Helsinki Corpus, the textual and contextual factors that influence the use of the English model 'could' and a set of 'semi models' with the structure 'able to +V'. Ziegeler concluded that metonymic inferences play a major role in developing counterfactual interpretations. For instance in the case of the semi-modal 'was/were able to', the results showed that this form occurred first in 1380 as a factive subordinate clause to express subjects's general characteristics and skills. In early modern English, the use of 'was/were able to' as factive subordinate clauses continued, but unlike the first meaning these forms became interpreted as generic past abilities of subjects. These abilities were not restricted to particular moment (e.g.,… when wee were able to shew it). However, by the end of 1600's, the increase in use of 'was/were to' forms, especially in constructions indicating specific time changed the meaning of these form from generic past abilities to time-specific abilities. The spread of the meaning of the actuality of past event introduced metonymic implicatures which suggested potential non actuality interpretations.

Ziegeler's study is significant because it is based on historical evidence. Ziegeler used the Helisnki corpus to track historically the meaning of the English modal 'could' and semi modals with the structure 'able to+ V'. Yet, the number of tokens that were analyzed is very small. This has negatively impacted the representativeness of the study.

Ziegeler (2007) maintained the contributing function of metonymic inferences in the grammaticlazition of the English modals once again. Ziegeler argued that the predictive meaning of the English modal 'will' can be explained in terms of pragmatic inferencing. Ziegeler hypothesized that will's prediction meaning is not directly derived from volition meaning; instead it is developed from generic uses. To verify her hypothesis, Ziegeler, first, identified, using, The Helsinki Corpus a number of texts from Old English and Middle English. Then she extracted all the occurrences in which the model will is used with first, second, and third person subjects. The data obtained was classified on the basis of the arguments' nature (i.e., referential or non-referential subjects/objects) into three categories: Volitional, generic and future function. The result of the study showed that there is a specific path to will's predictive meaning. Ziegeler claimed that the first stage on the will's predictive meaning is the volitional meaning that indicates desire and intention. At this stage the modal will is used with specific subjects. Through time, the modal will with the volitional meaning occurs with non-specific subjects. This weakens the volitional meaning and allows inanimate subjects which are not capable of volition to occur with the modal. As a result, generic senses that express omnitemporal prolactivity (i.e., timeless habitual behaviours) are developed. These omnitemporal uses which express time-stable situations are based on their frequent occurrences in the past. Being occurred in the past and the present time gives rise to probabilistic inferences: Speakers suggest that the omnitemporal prolactivities which express time stable events may continue to express future events of the same kind. These probabilistic inferences extend the meaning of the will to include predictive meanings that indicate hypothetical events instead of real ones. Ziegeler also claimed that will's predictive meaning is a source domain for its epistemic meaning. She argued that will's epistemic meaning is the result of speaker's subjectification. In this case, a speaker's prediction is not based on his/her observation of frequently occurred events; instead it is based on his/her presupposed knowledge that he/she holds at the moment of speaking.

Though Ziegeler provided empirical evidence to explain the semantic development of the English modal 'will'; the study suffers from some limitations. First, one can not make sure whether or not the metonymic inference analysis offered by Ziegeler to explain how will's predictive meaning emerges is accurate because the data, especially Old English data and Middle English data, is not sufficient enough to support her view. Second, Ziegeler did not explain in detail the role of subjectification in the development of will's epistemic meaning.

In addition to counterfactual implicatures and will's predictive meaning, Ziegeler (2010) emphasized the role of pragmatic inferencing in the development of 'have''s obligatory meaning. Unlike the previous studies (Fischer,1999, 2007; Gronemeyer, 2007) which suggested that 'have''s obligatory meaning is the result of a syntactic change of word order from SOV to SVO, Ziegeler assumed that pragmatic inferences do contribute in the grammaticalization of the verb have. Thus, she reexamined the previous studies on have to in

light with historical data that was extracted from the Helsinki Corpus and the Oxford English Dictionary Online. Ziegeler provided strong evidence against the studies that follow a syntactic – based approach instead of a semantic one. She argued that word order can not account for the grammaticalization of 'have to' because, first, some pre-infinitival constructions (i.e., older forms) are still used in present day English. Second, it is difficult to explain why the syntactic shift affects only the semantics of 'have to'. To account for the grammaticalization of 'have to', Ziegeler offered an alternative explanation. According to her, the obligatory meaning is a result of context-induced reinterpretation. Ziegeler showed that in Old English and Middle English 'have' was used in pre-infinitival constructions to indicate the possession of the NP. Through time, 'have' extended its restriction and took as its objects lexical sources that indicate some money owed by the subject. This gave rise to an inference which affected the meaning of the whole construction: 'have+NP' became understood as a customary duty, and the infinitive verb became interpreted as indicating an act of obligation. Later on, abstract concepts which can not be possessed entered the construction. As a result, the obligation meaning became the central meaning of 'have'. This obligation meaning was emphasized as a result of replacing NP objects with infinitive verbs.

The study of Ziegeler (2010) is of great significance. Ziegeler provided strong arguments against the syntactic-based approach, and argued, based on historical evidence, that the obligatory meaning of 'have to' is the result of pragmatic inferences. However, there is an interesting point that must be raised here. The data extracted from the Helsinki Corpus is limited; especially the Middle English data (the point in time in which meaning change is believed to be occurred). This raises questions about whether the obligatory meaning of ' have to' emerges from pragmatic inferences which are come to light as a result of using 'have' with NPs expressing some money owed by the subject.

Another study that offered a pragmatic inference analysis to account for modal verbs is the one that was introduced by Dension and Cort (2010) who described how the adjective better has acquired an obligation or necessity sense. After analyzing a number of tokens from different historical stages, Dension and Cort claimed that 'better' occurs first with 'be' in comparative and non-comparative constructions. In the case of non-comparative constructions, better expresses evaluative meaning, whilst in comparative construction it indicates the weak deontic meaning of advisability. Later on, better occurs with had. The increase use of 'had+better' in comparative constructions, produces pragmatic inferences whereby speakers change the meaning of better from a weak deontic meaning of advisibility to a more strong deontic meaning of directing other's behaviours. Dension and Cort also claimed that 'better' indicates epistemic meaning of hope as in 'it had better be important', and counterfactual interpretations as in 'you had better stayed with us'.

Although the study of Desnion and Cort (2010) showed that 'better' which is usually used to convey evaluative sense can be used as modal marker to convey deontic, epistemic and counterfactual interpretations, there are some limitations that need to be highlighted. First, the study of Desnion and Cort is not based on historical evidence. The two researchers did not trace diachronically the meaning of better; instead they analyzed separate sentences from different periods. This does not show how the meaning of better moves from one meaning to

another until it becomes a member of the category of modality. Another point that may be cited here is that Desnion and Cort did not illustrate in detail how pragmatic inferences caused the semantic change of better.

4.1.3 Other Suggestions

Unlike the two previously proposed approaches; other competing views are proposed to account for the grammaticalization of English modals. For instance, Nicolle (1998) emphasized the role of the relevance theory in analyzing the semantic development of grammatical markers. The relevance theory suggests that a linguistic expression encodes two types of information: A conceptual encoding and a procedural encoding. The former gives rise to conceptual representations or linguistically encoded information, whilst the latter offers constrains which manipulate inferential information which are derived from conceptual representations. Nicolle claimed that the distinction between conceptual and procedural encoding postulated by the relevance theory can be used to account for grammatical markers of modality, tense, and aspect. According to him, these grammatical markers are the result of adding procedural information to the semantics of linguistic expressions which encode conceptual information. To explain how a grammatical marker moves from conceptual encoding to procedural encoding, Nicolle analyzed the modal marker 'will'. He demonstrated that 'will' was used as lexical item with first person subjects to encode the conceptual information of desire which was metaphorically extended into intention. From this meaning, an inference is derived. As a result, 'will' shifted from encoding the conceptual information of intention to encoding the procedural information of prediction about future events. This new meaning was generalized as 'will' became used with second and third person subjects. Although this grammaticalization process is the result of several stages; Nicolle assumed that, since there is no intermediate stage between the conceptual and the procedural information, the grammaticalization of 'will' is not gradual but instantaneous.

The study of Nicolle (1998) is significant because it shows how grammatical markers of modality, tense, and aspect may be accounted for within the realm of the relevance theory. However, there are some limitations that need to be cited. First, Nicolle did not trace the historical development of modal, tense and aspect markers to show how these grammatical items may move from conceptual encoding to procedural encoding. Second, He assumed that 'will' moves from desire to intention; via metaphorical extension process, and from intention to prediction; through inferences. However, he did not provide arguments to show how will's sense of desire is metaphorically extended into intention which in turn shifted into prediction. Third, Nicolle also assumed that 'will' was not used with second and third subjects unless it shifted into a grammatical marker. His analysis of 'will' contradicts the one of Ziegeler (2007) who showed, based on historical evidence, that inanimate subjects are used with 'will' before it acquires the prediction meaning. The last point that may be raised here is that Nicolle did not illustrate how conceptual/procedural distinction can be used to account for deontic and epistemic modality.

Another view was offered by Narrog (2010) who claimed that the relationship between participants in a society is an important dimension in the historical development of modal

markers in worldwide languages. Narrog argued that the semantic shift of modal markers reflects an increase towards a speaker orientation. This concept of increased- speaker orientation is an adjustment to Traugott's two concept of subjectification and intersubjectification. A speaker-orientation refers to "the speaker her- or himself and the speech situation, including the hearer" (Narrog, 2010: 395). Based on Bybee et al's (1994) cross linguistic data, Narrog showed that in almost all types of modals' semantic change, including changes from epistemic to deontic meanings and changes within the area of deonticity or epistemicity, there is an increase towards a speaker- orientation which leads modal markers to move from the area of modality such as obligation, prediction, and possibility into the area of mood which expresses an illocutionary force such as imperative. He argued that changes from epistemic to deontic meanings, as in a shift from future to imperative (e.g., you will tell your father) take place because the addressee has less authority than the speaker. This assymetrical authority relationship turns a prediction meaning of will into a command. With regard to changes within the area of deonticity, Narrog claimed that an increase towards speaker orientation may result in meaning change from obligation to imperative (e.g., you must call your mother). He assumed that the speaker's use of obligation marker with second person subject gives rise to imperative meaning. As for changes within the epistemic domain, Narrog claimed that a modal that expresses a future prediction (e.g., will) may acquire, through the process of an increase towards speaker orientation, the sense of present prediction.

The study of Narrog (2010) suffered from some limitations. Narrog claimed that an increase towards speaker orientation may change modal markers from the area of modality into the area of mood and illocutionary force. This process of increased speaker orientation, from Narrog's viewpoint, involves both a speaker and an addressee. However, the explanations that he proposed to illustrate the role of the increased speaker orientation in the development of modal markers suggests that only one role, either the speaker or the addressee, is responsible for semantic change. The role of the speaker can be seen in the development of will's present prediction meaning from future prediction meaning. However, In the case of will' imperative sense, it is the addressee who interprets the speaker's future proposition as a command. Likewise, interpreting 'must' as indicating imperative meaning is done by the addressee.

Four years later, Narrog (2014) claimed that an increase towards a speaker orientation is not the last stage in modals' semantic change; instead it can be a source domain for another type of modal shift namely discourse or textual orientation. He claimed that the English modal 'may' which expresses subjective epistemic meaning is used as textual concessive marker that relates two propositions to each other to create textual and discourse coherence.

The study of Narrog (2014) showed that the English modal 'may' is used as concessive marker with textual function. However, his claim about the development of this textual function is based on no evidence. Though he examined Visser's (1969) historical data; the results are not clear to show how this textual marker emerges.

Auwera and Plungian (1998) introduced a semantic map to account for the semantic change of modal verbs. This semantic map which is an adjustment to the one presented by Bybee et al.

(1994) is used to identify cross-linguistically the synchronic and the diachronic semantic shift of modal verbs from premodal meanings through modal meanings to post-modal meanings. To establish such a model, Auwera and Plungian first identified, with regard to possibility and necessity, four domains of modality: The participant internal modality (i.e., possible or necessary circumstances which are internal to a participant), the participant external modality (i.e., external circumstances which make the event described possible or necessary), , the deontic modality(subdomain of the participant external modality: external authorities performed by speakers or social norms that permit or oblige the participant to do the action), and the epistemic modality (i.e., probable or uncertain judgments produced by speakers). Second, they explained Bybee et al.'s semantic map by making a special reference to the four terms mentioned above, and introduced their own semantic map. Before explaining Auwera and Plungian's semantic model we will illustrate how they applied their four terms to Bybee et al' s (1994) semantic map. Bybee et al. (1994) argued that semantic map for modality involves two mini-maps: One is for possibility modality and the other is for necessity modality. Concerning possibility modality, Bybee et al. (1994) offered one path by which the meaning of possible modality moves from premodal domains to central domains to post-modal domains. The semantic map shows that the starting point of possible modality is a set of lexical sources 'be strong' and 'know', 'arrived at', finish', and 'suffice'. These lexical sources which constitute the pre-modal domain develop into participant external possibility which in turn develops into deontic possibility or epistemic possibility. This latter can be extended to include post-modal domains such 'condition', 'concession', and 'complementation'. The map also shows that deontic and epistemic possibility are not always arrived at as a result of intermediate stages; instead they may be directly derived from lexical sources. While the lexical sources such as ' be permitted' and 'dare' give rise to deontic possibility, the lexical sources such as ' be', 'become', I don't know, and 'like' result in epistemic modality. Auwera and Plungian hypothesized that these semantic shifts can be explained with regard to two main mechanism: Semantic specialization and metaphor/metonymy. They proposed that a change from a specific meaning to a more generalized one requires metaphor or metonymy; by contrast, a change from a more general meaning to specific one involves semantic specialization.

Regarding necessity modality, Bybee et al. (1994) identified tow paths. The first path shows a canonical change from pre-modal domain towards modal and post modal domains. It shows that some lexical sources (pre-modal domain) give rise to participant internal necessity from which deontic necessity is emerged. This deontic necessity is changed towards participant external necessity which is in turn extended into epistemic necessity and post modal domains of future, imperative, concession and complementation. The second path displays that epistemic necessity can be derived from the premodal domain of future.

Auwera and Plungian (1998) attempted to integrate the possibility and the necessity maps offered by Bybee et al. (1994) into one single map. First, they connected the two paths of necessity. To do this, Auwera and Plungian assumed that there are two cyclic processes: Demodalization and remodalization. The first process is the one by the means of which the post-modal domain of future is developed from the participant external necessity. The second

process is the one which uses the output of the demodalization process (i.e. post-modal domain of future) as a premodal domain to generate epistemic necessity. Second, they connected the paths of possibility and necessity. Auwera and Plungian (1998) argued that there are two main reasons that lead to unification. They assumed that the possibility and the necessity modals share various post-modal domains. Furthermore, they showed that, in some languages like Dutch and German, deontic possibility can result in deontic necessity or vice versa. Auwera and Plungian (1998) suggested that their modality' s map can be used to study synchronic and diachronic semantics. They argued that through time paths of the semantic map can be split. Hence, a modal marker may move along new paths. Some of these paths may be kept; however, others may be deleted. Consequently, a model marker may, over time, keep some meanings and lose others.

The study of Auwera and Plungian (1998) is of great significance because it introduced a semantic map that can be used to examine the semantic development of modal markers. However, this does not mean that their study is not without problems. First, Auwera and Plungian did not show how lexical sources are developed into modal meaning. Second, they did not specify the mechanisms by the means of which a modal marker may move from one domain into another. The last point to be made here is that Auwera and Plungian did not use historical data to show how premodal domains result in central domains which in turn results in pot-modal domains.

Goossens (2012) used Auwera and Plungian's (1998) semantic map to identify the patterns which are used to extend the meanings of modal verbs. Goossens (1998:149) argued that "neither metaphor nor metonymy provides adequate ways to account for the meaning shifts which the modals exhibit. "Partial sanction", on the other hand, appears to be a better candidate". To show how the meaning of must change through time, Goossens analyzed his preveious data (1987) which contains 100 uses of magan from Ælfric. Besides, he examined the uses of 'must' from the Helisnki corpus and three present day corpora. Goossens showed that the semantics of the English modal 'must' moves along four stage: The result of his study revealed that the prototypical meaning of magan is the participant-internal sense (i.e, subject's internal capacity). This meaning gives rise to a second less prototypical meaning which is participant external sense (i.e., external capacity). This second meaning is developed into general objective necessity sense which is extended into epistemic necessity. Goossens argued that what makes the semantics of the English modal moves into a new stage (i.e. new meaning) is the partial sanction uses of the previous one.

The study of Goossens (2012) suffered from some limitations. Though Goossens (2012) argued that 'partial sanction' is the mechanism by the means of which the meaning of must moves from participant internal sense to participant external sense towards epistemic sense; he did not explain in detail how this mechansim results in meaning change. Moreover, Goossens did not show how the participant internal meaning emerged.

4.2 Tense and Aspect

There are 6 studies that investigate the grammaticalization of tense and aspect markers within the realm of cognitive semantics. This section is divided into two subsections: in Section

4.2.1, two studies that follows the metaphorical approach is reviewed and critiqued. In Section 4.2.2, four studies that adopted the pragmatic inferencing approach are reviewed and critiqued.

4.2.1 The Metaphorical Approach

Jarad (2015) explored the grammaticalization of the Emirati Arabic lexical item 'yalis' (i.e., sitting) into a progressive aspect marker. To conduct his research, Jarad analyzed the lexical item 'yalis' using several sources including a questionnaire, interviews and communication with native speakers, and television series. Jarad argued that the linguistic environments in which the active participle 'yalis' occurs play a salient role in the development of the progressive maker. The results of this study revealed that the first meaning of 'yalis' is to indicate a specific body posture in a particular location. This meaning has been desemanticized as new constructions are introduced: Once 'yalis' is associated with imperfective verbs, on the one hand its content reading has been lost, on the other hand, a new a grammatical reading that expresses the progressivity or the durativity of events is developed. Jarad claimed that this process of grammaticalization is the result of a metaphorical mapping process whereby the concrete spatial domain of 'yalis' is extended into an abstract temporal domain that expresses progressive aspect.

The study of Jarad (2015) suffered from some methodological limitations that need to be cited. Jarad used data from present day Emirati Arabic instead of tracing diachronically the semantic change of 'yalis'. This has negatively impacted his results mainly for two reasons. First, this methodology can not show the pathways of the grammaticalization of 'yalis' because, in present day, the two uses of 'yalis' do co-exist as conventional meanings. Second, it does not provide evidence to support that the metaphorical mapping process is the right mechanism by the means of which 'yalis' is developed into a progressive marker.

Van Rompaey (2016) also emphasized the role of metaphorical extension in the development of English progressive aspect from constructions of the type NP_1 of NP_2/V-ing. Van Rompaey investigated how structures that include the semi auxiliary 'be' and the phrase 'in the middle/midst' can express progressivity. Van Rompaey used several data sources, including the Helsinki Corpus (HC), the Penn-Helsinki Parsed Corpus of Early Modern English, the Corpus of Early Modern English Texts (CEMET), the Corpus of Late Modern English Texts Extended Version, and Wordbanks Online, to analyze the uses of middle and midst in Old, Middle, and Modern English. The result of her study revealed that the word 'middle' was first used in Old English, whether in simple or complex structures, as a subject, complement or object head that indicated a spatial midpoint between two objects. Around 1150, the word 'middle' was used to refer not only to spatial relationship, but also to a midpoint in time. Regarding the word 'midst', the results showed that it was developed in 15th century. This word which seems to have the same syntactic function of 'middle' described both a spatial and temporal midpoint. In Middle English, the two words were used as a complex preposition followed by NP2 (in the middle/midst of NP2). This affected their meanings: The two words were no longer used to describe a precise and accurate point (i.e.,

midpoint) in space or time; instead they became used to indicate any point in a location or a time zone described by basic nouns in NP2.

In 1600's, a new semantic class of nouns expressing dynamic actions and events was used as NP2. As a result, the meaning of 'middle' and 'midst' was metaphorically extended to indicate spatial and temporal relationship of event nouns in NP2. This metaphorical extension gave birth to a new semantic change: The NP1 which is part of the complex preposition became interpreted as a nominal aspectualizer expressing the progressivity of event nouns in NP2. That is, 'in middle/midst of' was used to describe events in matrix clauses in relation to events in NPs2. To put it in other words, events in matrix clauses are expressed as being occurred in a particular point in the time zone of NP2 events. This suggests that the two nominal aspectualizers were used as optional clausal adjuncts which are synonymous to while-clauses. In the second half of 17th, a syntactic reanalysis occurred: The two nominal aspectualizers became used as 'be''s complements and, therefore, functioned as obligatory parts of the prediction. This new function brought about new constructions: By the end of 19th century, events nouns (e.g., fight) in NPs 2 were transformed into deverbal nouns ending in ing (e.g., fighting). This transformation in NPs2 seems to be an essential condition for a new semantic development: 'In the middle/midst of' became interpreted as a semy-auxiliary that indicates the progressive aspect of verbs ending in 'ing'.

The study of Van Rompaey (2016) is of great significance because it shows how the two words 'middle' and 'midst' are developed into aspectual markers. However, there is a point that needs to be raised here. Van Rompaey did not explain how and why the meaning of the two words moves from indicting a spatial midpoint to expressing a temporal midpoint.

4.2.2 The Metonymic Inferencing Approach

The role of metonymic inferences in the development of aspectual markers was emphasized by Ziegeler (2006) who explored, in her book, the diachronic semantic shift of two grammatical aspects namely progressivity and perfectivity. To identify the origin and the pathways of grammaticalization for each aspectual type, Ziegeler used texts from the Helsinki Corpus and other linguists' historical data (e.g. Visser (1973), Denison (1993), and Scheffer (1975)) to examine the uses of aspectual markers in Old English and Middle English in light of present day uses. Concerning progressivity, Ziegeler argued that the origin of the English imperfective uses is a participle form that expresses a generic agentivity. The function of this agent noun which is derived from an activity verb and used as an adjective is to indicate the subject's characteristic with which it is associated mainly stative characteristics and habitual activities. Later, the time-stable characteristic or the durativity of the agent is developed, through pragmatic inference, into a progressive aspect.

With regard to perfectivity, Ziegeler investigated the semantic change of do. She argued that the source of the perfective do is a lexical verb. This verb which is transitive developed into an auxiliary that lost it lexical meaning. 'Do' moves from a causative marker in bi-clausal structure into an affirmative declarative non causative auxiliary in a single word structure. To explain the grammaticalization process, Ziegeler identified four stages. At stage one, 'do' is used in mono-clausal structures to express causative meaning. This latter with the prefix 'ge'

results in the lexification of resultative interpretations. At stage two, a syntactic change takes place: do's adjectival complement is replaced by an infinitival one. Consequently, periphrastic uses emerged in which 'do' collocates with infinitives. This yields to biclausal causative constructions. At stage three, a reanalysis process occurs by the means of which resultative bi-clausal structures turn into mono-clausal ones. At the last stage, the semantics of do changes, through reanalysis, from a causative marker into an auxiliary that indicates the perfective aspect of the verb with which it is associated.

The study of Ziegeler is of great interest. It illustrates, based on historical data, the grammaticalization pathways of the two aspectual markers. Besides, it provides arguments in favor of the metonymic inferencing approach.

In similar to Ziegeler's (2006) ideas, Caudal (2012) maintained the role of pragmatics in the study of tense-aspect forms from a synchronic and a diachronic perspective. Caudal showed that, synchronically speaking, imperfective past tenses such as the English past progressive and the French imparfait which indicate past events can be used to describe, in some contexts, situations that occur at the same time of speaking. He also showed that some contextual uses of French imparfait express polite speech acts. Caudal argued that these new tense-aspect uses is the result of driving conversational implicatures from semantic conventional tense-aspect forms. He hypothesized that interlocutors take imperfective past tense of an event and extend it, through pragmatic implicatures into the present tense. Caudal assumed that these pragmatic conversational processes which give rise to occasional aspectual-tense interpretations play a major role in the diachronic evolution of tense-aspect forms. He claimed that the English perfect tense is the result of applying a strengthening process on a pragmatic implicature. Caudal stated that the starting point of the English perfect tense is Latin resultative constructions. These constructions were used in Old English to express adjective readings in which the agent of causing is not indicated. This latter was specified, through a contextual conversational implicature, as the subject of a resultative construction. Consequently, a proto-perfect reading evolved. Through time, the new pragmatic implicature was semantically strengthened into what is known now as the perfect tense.

Though the study of Caudal (2012) showed that English past progressive and French imparfait can indicate present time situations; his claim about the developments of such uses was not proven. Caudal did not trace the historical semantic change of English past progressive and French imparfait. His claims are based on present day uses.

Another study which approved the metonymic inferencing approach is the one conducted by Nicolle (2012) who explored the means by which a TA system is cross-linguistically brought about and changed through time. Nicolle discussed, based on other researchers' data, primary and secondary grammaticalization of TA system in a number of languages. Nicolle assumed that pragmatic inferences which results in primary grammaticalization are not derived from lexical items per se; instead they are developed from the constructions in which these lexical item may occur. He explained his point by making a specific reference to the development of the Kiswahili completive aspect marker 'sha'. Nicolle claimed that what results in the aspect marker 'sha' is putting the verb 'kwisha' (i.e., finish) in a specific linguistic environment.

From Nicolle's viewpoint, when the verb 'kwisha' was used in a construction in which it is preceded by marker me and is followed by an infinitive verb, new interpretations were derived via pragmatic inferences: Either the verb kwisha is understood as the main verb followed by a an infinitive verbal complement or it is considered as an auxiliary that indicates the completion of the situation. Through time, kwisha was affixed to the infinitival verbs with which it collocated. Consequently, kwisha lost its first reading and became a conventional completive aspect marker. In the course of time, phonological and morphological changes were attested: Kwisha lost its first syllable leaving behind the syllable 'sha'. This latter was affixed to the marker 'me'. The resulting 'mesha' was subsequently reduced to the completive aspect marker 'sha'. Despite being the input of primary grammaticalization; not any lexical item can develop into a TA marker. Nicolle proposed that, in all most all languages, verbs of motion and those which indicate spatial positions are the most common source for the emergence of TA markers.

Regarding secondary grammaticalization, Nicolle assumed that aspect markers often develop into tense markers cross-linguistically. He showed that in spoken Modern French and spoken Modern German, perfect aspect markers are usually used to express past tenses. Nicolle argued that TA markers which are the results of secondary grammaticalization are, in most cases, developed from verbal inflections. Nicolle concluded that to study primary and secondary grammaticalization of TA markers one needs to take into account two mechanisms: The reinforcing force and he obstructing force. From Nicolle's viewpoint, these two mechanisms explain the crosslinguistic variation in the TA system.

There are some limitations in this study that need to be highlighted. First, Nicolle (2012) did not provide historical evidence to show how secondary grammaticalization may take place. Second, he did not offer empirical arguments to show how the reinforcing force and the obstructing force may result in different TA markers across languages.

5. Conclusion

The discussion presented above shows how controversial is the issue of grammaticalization of modality, tense, and aspect. It is clear that cognitive semantics offers two competing approaches to account for the grammaticalization of the three markers: The metaphorical approach and the metonymic inferencing approach. Each group offers plausible arguments to support its view. On the one hand, it appears that modal, tense, and aspect markers are developed through the metaphorical extension because there is a mapping process from the concrete domain of lexical sources which are constructed from the real world into the abstract domain of modality, tense, and aspectuality. On the other hand, it seems that the linguistic environments in which modal, tense and aspect markers occur give rise to pragmatic inferences which lead these markers to acquire grammatical functions. To this end, more studies on the grammaticalization of modals, tenses, and aspects, need to be conduct. For such studies to be representative, the results must be based on real evidence; instead of hypothetical one. Thus, more diachronic investigations are required. Moreover, factors such as linguistic and contextual environments must be taken into account to analyze any

grammaticalization process. Besides, one should not neglect cultural variations because modal, tense and aspect markers vary from one culture to another.

The last point to be raised here is that most of the studies which investigate modals, tense, and aspect markers are in English. Other languages receive less or no attention at all. Thus further research in languages, other than English, is recommended in order provide a clear picture of the grammaticalization process of modality, tense, and aspect.

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