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THE EXPRESSION OF MODALITY IN IRANIAN SIGN LANGUAGE (ZEI)

Sara Siyavoshi

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THE EXPRESSION OF MODALITY IN IRANIAN SIGN LANGUAGE (ZEI)

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DISSERTATION

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DEDICATION

This work is dedicated to the Iranian deaf community, especially the deaf children.

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The Expression of Modality in Iranian Sign Language (ZEI)

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ABSTRACT

This dissertation uses data from Zaban Eshareh Irani, Iranian Sign Language, to investigate the linguistic strategies for the expression of modality in this language. Manual and facial markers of modality are recognized and analyzed based on their form and the semantic domain each covers. Vander Auwera and Plungian (1998) offered a semantic map for categorization of different modals across languages. According to their framework, modality can be classified into two vast domains of possibility and necessity. Based on the source of the modal force then, each modality domain is categorized into three groups of participant-external, participant-internal and epistemic. In this dissertation, ZEI modal markers are discussed based on different discursive contexts in which they appear, and then categorized within Van der Auwera and Plungian (1998) framework.

Apart from a discursive semantic analysis of ZEI modals, I try to develop a cognitive approach towards understanding facial channel in signed languages as opposed to the manual one. Facial markers have always been analyzed as important parts of signed languages grammar. Three distinct facial markers are explained as markers of modality,

both with and without accompanying a manual marker. Applying a cognitive grammar approach to modality (Langacker 1991, 2008, 2013), I show that facial markers are the main indicators of epistemic modality in ZEI. Facial markers are also involved in non-epistemic (effective) modality, for example by marking the degree of modality force.

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CHAPTER 1

1 INTRODUCTION

Modality is usually associated with the concepts of possibility, probability, obligation or necessity. The way the speaker makes a judgment about the completion or not completion of a certain action, or realization of a state is expressed by modality. There are many different mechanisms for expressing modality in languages. Modality can be expressed by modal lexemes or modal auxiliaries or inflectional coding on the verb.

Modality has been receiving attention from scholars of different disciplines, including grammarians, semanticists, discourse analysts, and philosophers. However, there has not been always agreement on what constitutes this domain and what the definition of modality is. As Bybee (1994:176) stated “it may be impossible to come up with a succinct characterization of the notional domain of modality”. There are some domains like possibility and necessity with less dispute as to be included in the realm of modality, and some others like evidentiality and volition with high amount of disagreement.

Throughout past decades different approaches to study of modality have been developed in which modality is analyzed not only in terms of propositional semantics of a single sentence, but also in terms of interactional, textual, cognitive and discursive functions of modality. Pragmatic, discursive and cognitive analysis are part of the present study as well. This study aims to do the initial steps in describing and analyzing markers of modality in Iranian Sign Language (ZEI). The research will be limited to the semantic domains of necessity and possibility.

1.1 Introduction to ZEI and the Iranian deaf community

Zaban Eshareh Irani (ZEI) is the signed language used by the Deaf community in Iran and probably in some neighbor areas, like Iraq and Afghanistan border regions. This language is also referred to as Persian Sign Language in the literature. A great degree of regional variation is observable among ZEI signers from different areas in Iran. The number of ZEI users and the total number of the deaf in Iran is unknown. The Department of Health and Welfare reports that more than two hundred thousand people have self-identified as deaf when registering for social and medical services in 2017. Other statistics in other official records have notified the population of Iranian deaf people with different numbers, between 500,000 and 1.5 million.

In Iran, ZEI is not recognized as a legitimate language for the education of deaf students. There are more than 40 active deaf clubs across the country, which are the main community centers for the deaf people to gather daily and organize a variety of cultural, religious and sport and physical activities.

The first school for the deaf children was established in 1926 in Iran. For decades after that, there has been deaf schools all over the country albeit with focus on oralist approaches or total communication. Deaf teachers were hired in deaf schools, and although no emphasis has ever been on using natural sign language in classroom, signing has never been banned or prohibited at schools. Recent policies, however, are toward dismissing deaf schools. Deaf children are being sent to mainstream schools in a program called “integrated program” in which deaf children receive assistance from deaf specialists who are supposed to be familiar with sign language. This has reduced the number of deaf schools and

consequently, the effective daily communication among deaf children in the recent decades. The number of deaf schools in Tehran has decreased from 15 schools in 2000s to only 6 schools in 2017.

Linguistic studies on ZEI began by two MA theses in 2006, one on the natural language of the Iranian deaf (Siyavoshi 2006) and the other on standardized signs in published dictionaries (Sharafzade 2006). Since then, ZEI has begun receiving more attention from linguistics students, and preliminary descriptions of this language are presently under way (e.g., simultaneity in ZEI phonology and discourse [Siyavoshi 2009, Siyavoshi 2017], tense in ZEI [Kabiri 2013], tense and aspect in ZEI [Tabiei 2014], and ZEI fingerspelling [Sanjabi et al. 2016]).

Like many other signed languages, non-manual markers including facial movements (eyes, brows and lips), head movements, and body postures are important in conveying meaning in ZEI. Each of the two hands can simultaneously carry distinct meanings in ZEI (Siyavoshi 2017), the accompanying facial markers and other non-manuals can add a third. Manner of articulation and speed of movement also carry meanings and are significant in conveying linguistic messages. Word order seems to be flexible or with much varieties. SVO and SOV, have been claimed to be the basic ZEI word orders (Siyavoshi 2006, Sanjabi et al. 2016).

There are several ASL and ASL-like signs in ZEI due to pedagogic relations to American teachers during 1970s. There has been a tendency among literate and educated deaf and deaf experts to replace ZEI signs by ASL equals, probably due to higher prestige of ASL.

1.2 Modality's Semantic map

Modality categorization by van der Auwera and Plungian (1998) is the main classification tool for the current study. In a cross-linguistic work presented by van der Auwera and Plungian (1998), modality is restricted to two main semantic categories of necessity and possibility. These categories are being analyzed and categorized based on the source of the possibility or necessity conditions, i.e. if it is internal or external to the agent. Participant-internal necessity / possibility refers to the condition in which the main clause agent is the source of obligation or possibility that make or enable them to complete an action. Participant-external modality refers to those situations where the source of possibility / necessity placed on the main clause agent is external. If the external source is some social authority or rule, then the condition would be classified as deontic necessity/ possibility. Thus, in this approach to modality, deontic category is a special sub-category of participant-external category. Epistemic modality in this framework, is related to the expression of degrees of commitment to the truth of a proposition. This classification frame allows us to consider the discourse function of each modal marker and explore different semantic areas in which a marker is applied based on the intention of the speech.

1.3 Grammaticization theory

It has been shown that some modal markers in languages are the result of semantic changes of lexical units which develop grammatical functions. Bybee (1994) shows that the modal and auxiliary verbs that express possibility in many languages originate as lexical items with the meaning of physical ability. In the pathway toward becoming a grammatical marker, the physical ability sense extends to general ability. Examples of this

process have been shown in *can* and *may* in English, *pouvoir* in French and *poder* in Spanish.

By analyzing different implications of *can* in English, Bybee (1994:190-192) argues that since most activities that require mental ability also require some physical ability, meaning transition from mental ability to general ability is easy to understand. Another step is the generalization from meaning of ability (mental and/or physical) to root possibility. In this step some components of meaning related to agency are dropped and some external features take roles in the possibility of completing an action. A proposed explanation is that in completing any action there are agent abilities and external possibilities involved. Therefore, in three stages of meaning change, *can* predicates that

- (i) mental enabling conditions exist in the agent
- (ii) enabling conditions exist in the agent
- (iii) enabling conditions exist

for the completion of the main predicate situation. Enabling conditions might be physical and/or social. The permission meaning of root possibility is related to social enabling conditions (Bybee, 1994: 192-3).

Giving cross-linguistic evidences, Bybee (1994) also shows a further independent path of agent-oriented modals out of which epistemic function of possibility modals develop. The observed regularity among different languages lends support to the hypothesis that grammaticization paths are universal and predictable on general semantic principles.

Two or more different meaning-functions of one single form might co-exist in the language. This phenomenon gives us synchronic evidence of a change through the time.

Van der Auwera & Plangian (1998:100), proposed that ambiguity among different meanings of the same modal form might signal occurrence of a grammaticization path. Because while a new meaning emerges out of a modal marker, the old usage/meaning of that marker co-exists with new ones. Thus, polysemy and ambiguity can be seen as evidences of grammaticization.

1.4 Cognitive grammar

Another semantic and grammatical analysis tool used in this study is cognitive grammar (CG). Langacker (1991) analyzes modality (English modals specifically) by introducing the concept of reality in a cognitive model that he calls *epistemic model of reality*. Reality in his account is an ever-evolving entity whose evolution continuously augments the complexity of the structure already defined by its previous history (1991: 243). A particular conceptualizer (C) accepts some situations or states of affairs as being part of reality, and some other situations part of either not real, or part of potential reality or projected reality. Using modal auxiliaries in an utterance is an indicator of the latter. The accumulation of all real/not real situations through time shapes the conception of reality for the conceptualizer who is located at the leading edge of the expanding structure of reality. The vantage point from which the conceptualizer views things is called *immediate reality*. Irreality comprises everything other than reality and it – just like reality- is dependent to the conceptualizer and not the actual world (Langacker 1991: 243).

Langacker analyzes modality in English modal verbs *may, can, will, shall, and must* in terms of grounding. The term ground is used in CG to indicate the speech event, its participants (speaker and hearer), their interaction, and the immediate circumstances (the

time and place of speaking). A grounding element specifies the ground of the thing profiled by a nominal or the process profiled by a finite clause (2008a: 259). Determiners are nominal grounding elements, and tense and modality are clausal grounding. Modality in cognitive grammar, similar to tense, invokes the ground as a reference point. The presence or absence of modal markers shows whether the speech act participants accept the designated process as a matter of established reality. Thus, in the epistemic model of reality, modality can be explained based on the speaker's knowledge. The statement without modal markers indicates that the speaker accepts the designated process as part of reality whereas the presence of modal markers places the statement in the realm of irreality (1991: 245).

[The] profiled relationship has not been incorporated into the speaker's reality conception. It is however a candidate for acceptance. It is under consideration, and the speaker inclines towards accepting it with varying degrees of force, reflected in the different modal choices. . . . [This] requires mental effort and engenders a force dynamic experience. (Langacker 2006: 21–2)

Modals are indicators of some kind of 'potency' ascribed to an action, which – “when unleashed – can lead to its execution of the action”. Thus, modality involves some kind of force tending towards the event's occurrence (Langacker 2008a: 304). Instead of root, dynamic or deontic modality, Langacker uses the term “effective” to refer to non-epistemic modality.

Another notion by which Langacker (2013) explains English modal markers is “control cycle” (Figure 3). In the control cycle model, there are four phases regarding the

agent (A), its dominion (D) and a new occurrence or target (T). The agent's dominion is what is already under its control. The presence of modal markers indicates the Potential phase of the control cycle in which the conceptualizer is to influence the evolution of reality by deciding whether or not to include T in the dominion. Modals represent the conceptualizer assessing a potential new occurrence which is not part of the conceptualizer's reality domain but which she strives to control. The assessment of state of affairs based on the conceptualizer's reality conception is the key notion in analyzing modality in CG. This approach is used in this dissertation for studying epistemic modality in ZEI data.

1.5 Outline of Chapters

This dissertation begins with an overview of important approaches to the study of modality and the different accounts on the definition and classification of modals (Chapter 2). I discuss the concepts of *realis* and *irrealis* and their relation to modality in Section 2.2. where I summarize some important approaches to the issue. Section 2.3 presents the concept of subjectivity as a frequent discussion tightly related to modality. Section 2.4 reviews two of the most cited account on classification of modals which are Bybee, Perkins, and Pagliuca (1994) and Bybee and Fleischman (1995). In Section 2.5, I refer to pragmatic and discursive approaches (Sweetser 1990, Wierzbicka 1987) toward analyzing modals. Section 2.6 summarizes van der Auwera and Plungian (1998) framework in categorization of modals which is the framework applied for this study. The subcategories of participant-internal, participant-external, deontic and epistemic modality are explained in this section. In Section 2.7, I review modality in cognitive grammar framework (Langacker 1991, 2008, 2013) by reviewing the concepts of *reality* and *control cycle* in

CG. Section 2.8 reviews the grammaticization theory and the concept of directionality in modals' semantic change (Bybee 1994, Van der Auwera & Plungian 1998 & Langacker 1990, 1991a, 1999, 2003).

In Section 2.9, I review all studies and their findings on modality in signed languages. Modality has been studied so far in nine signed languages: ASL, LSC, LIS, DGS, LSE, ISL, OGS, Russian SL and Libras. I review the issues that have been addressed in the studies on signed languages modals in this section. The role of non-manual markers and manner of movement, the position of modals in the sentences, negation of modals and grammaticization of modal signs have been addressed in the studies of modality in sign languages. The findings of grammaticization of modal signs both from lexical and gestural roots are presented in the section 2.10.

Chapter 3 includes methodology, the characteristics of video data I used for this study, the way I analyzed the data, as well as glossing and transcription conventions. Chapter 4 comprise the analysis of manual modal signs in ZEI under two categories of possibility and necessity modals, and in subcategories participant-internal, participant-external, deontic and epistemic. I analyze each elicited modal sign based on the semantic-discursive characteristics in which it appears.

Chapter 5 is assigned to the analysis of facial markers in the expression of modality. A Cognitive Grammar framework is used to distinguish epistemic and non-epistemic (effective) modality and the role of facial displays in this regard. Topics discussed in this final chapter include gesture account on facial markers, facial markers' modality value in signed languages, and a cognitive account on modality and facial markers.

Chapter 2

2 REVIEW OF LITERATURE

The concept of modality has been receiving interests for a long time in different disciplines of logic, philosophy and linguistics. In *Critique of pure reason*, Kant has used the term *Modalitat* to refer to the necessity and possibility of propositions (Pape 1966:14-15), and he considered *Modalitat* one of the four classes of human judgment, next to quantity, quality, and relation.

Modality has been a very prominent grammatical and semantic category in linguistic analysis. This concept and its subdomains have been analyzing from many different viewpoints. Modality encompasses a semantically diverse set of functions. Due to its complex semantics, divergence is common in how this notion has been defined and what subcategories have been listed under the rubric of modality. Thus, many different issues and perspectives on the field of modality can be observed in the literature. The way modality has been defined in different studies shows a continuum. Some have considered modality as its broad sense which is any kind of speaker modification of a state of affairs, whereas some have taken this as a grammatical category of verbs.

According to Palmer (2001), modality is a cross-linguistic grammatical category which, along with tense and aspect, is concerned with the event or situation reported by an utterance. However, unlike tense and aspect which are categories associated with the nature of the event itself, modality is concerned with the status of the proposition that describes the event. The term ‘mood’ has been next to modality in the literature and, they have

sometimes been used interchangeably or without a clear distinction. However, Bybee (1994: 181) made a distinction between the notions of mood and modality and stated that “modality is the conceptual domain, and mood is its inflectional expression”.

Notions of possibility and necessity are among the most cited concepts of modality in different scholars’ works. In a semantics approach to modality, all modal categories can be classified in terms of notions of ‘possibility’ and ‘necessity’ (e.g. Kratzer 1978; van der Auwera 1996; van der Auwera and Plungian 1998). However, there has been many different categorizations in different studies and frameworks on modality. A brief overview of different modality categorization is given in the following part.

2.1 Classification of modals

Modality has traditionally been classified into dynamic, deontic, and epistemic categories. Dynamic possibility is related to the ability of the controlling participant (Goossens 1985). Dynamic necessity pertains to a need or necessity of the controlling participant (Palmer 1979:91). In some accounts, dynamic and deontic modality have been combined into a single category, termed “root modality” by Hoffmann (1976) and Coates (1983), and “event modality” by Palmer (2001).

Palmer (2001) distinguishes two types of modality: propositional modality and event modality. Under the rubric of propositional are those statements that express the speaker's attitude about the truth or factivity of the proposition. Propositional modality can be divided into two subcategories: epistemic and evidential. The second class, event modality is related to events that have not happened yet and is predicated on the possibility of their occurrence. In Palmer’s framework, event modality has the subcategories of

deontic and dynamic. Palmer's approach to modality focuses more on formal semantic of modal markers and does not enter into pragmatic and discourse realm.

Another categorization of modality in the literature is root modality vs. epistemic modality. In this frame (Talmy 1988, Sweetser 1990, Coates 1983, and Hofmann 1976), all non-epistemic modality is labeled root modality which is the same as 'event modality' in Palmer's categorization.

Divergence in the study of modality does not lay only on different systems of categorizations, but also on the areas should be included in the realm of modality. This is observable in the case of epistemic modality and evidentiality. The category of epistemic modality refers to the degree of commitment to the truth of the proposition. This type of modality is somewhat less controversial in different frames of categorization. There is, however, disagreement among scholars in inclusion of evidentiality (specification of the source of information), and volition expressions in epistemic modality.

Narrog (2005b) takes all the concepts of modality into two categories of volitive modality and non-volitive modality. Volitive modality is related to the element of "will" or force towards the realization of the state of affairs, whereas in non-volitive modals, dynamic, epistemic, and evidential modality there is no force or will element toward the upcoming event.

In attempt to find commonalities between all different definitions of modality, Traugott (2011) enumerated three characteristics for modal utterances, they are:

- (i) non-factual (or 'irrealis'),
- (ii) relativize states of affairs to a set of possible worlds,

(iii) involve speaker's comment on the necessity or possibility of the state of affairs. (2011, 382).

Irrealis refers to semantic and also morphosyntactic category related to non-actualization of a given state of affairs. It worth explaining more details about the term irrealis, since this notion has some overlaps, relations and implications with the domain of modality.

2.2 Realis vs. irrealis

Realis-irrealis is an important pair concept in discussing modality. The first term refers to events that have happened or are happening, whereas the second refers to events that belong to the individual's imagination, prediction, or desire that have not happened but perhaps can occur at some future point. Palmer (2001) points out that we should not think that realis/irrealis are equivalent to the real/non-real distinction, since an event expressed with markers of realis is not always real and those that are marked with irrealis are not always non-real. In fact, the terms realis and irrealis is related to the way an utterance can be expressed in terms of "reality status" in language. 'Reality status', as Elliott (2000:67) states, pertains to "the grammaticalized expression of location in either the real or some unreal world".

The concepts of realis/irrealis are also discussed in cognitive grammar by Langacker (1991, 2013) in a different perspective. In his epistemic 'reality model', reality is characterized as a path evolving through time. Reality encompasses the history of actual occurrences. A particular conceptualizer has her own take on this history which includes past and present events. Thus, our understanding of reality is partial and imperfect. The

vantage point from which the conceptualizer views things is called ‘immediate reality’. Irreality comprises everything other than reality and it, just like reality, is dependent to the conceptualizer and not the actual world (Langacker 1991: 243).

In some languages, the speaker encodes the utterance to show if an event or state of affair locates in actual world or a possible world. For example, indicative vs subjunctive mood in many languages is a grammatical means for this semantic distinction. The grammatical markers sometimes overlap with modality markers. Epistemic modality, by which the speakers express their evaluation about the factual status of a statement can be marked by subjunctive mood. Speculations, inferences, and assumptions are notions included in irrealis. Basically, epistemic, deontic and desiderative meanings can be marked by irrealis markers in some languages. However, different cross-linguistic findings indicate totally different coding in terms of realis-irrealis markers, and that makes disagreement on whether irrealis is a grammatical category or not.

According to Bybee et al. (1994: 236-240) and Bybee (1998) since this category is grouped in different grammatical category in different languages and not a binary distinction is observed in a big sample of world languages, reality status might not represent a mental category, and thus, it is not a linguistic category by its own. De Haan (2012) has different perspective on the irrealis issue. He considers irrealis as a full-fledge category as tense and aspect that interacts with these categories in conveying different semantic domains.

Other approach to irrealis category is a prototype approach by Givon (1994) and Plungian (2005) in which the irrealis is considered a cross-linguistically valid category to

which a group of language show many similarities in encoding and the other group do not. Thus, we have core instances with high agreement in irrealis patterns and peripheral areas that do not follow the core patterns. Prototypical irrealis meanings are contrafactual, optative, conjunctive, intentional, volitional, probabilitive, and durative (Plungian 2005: 138). These semantic domains have a similar irrealis encoding in all languages that make a relevant distinction while, the future or negation domains are peripheral instances of the prototype that can be marked as realis or irrealis, depending on the language (Nikolaeva, 2016: 83).

2.3 Subjectivity

Subjectivity is one of the most widely-used concepts in the literature on modality. It is one of the fundamental points that is used to distinguish types of modals. From one point of view, all modal statements might seem to be in the subjective realm, because they express the speaker's attitude, opinion, or belief about a statement. However, the boundary between what is subjective and what is objective is not so clear. As Lyons (1977) suggests, some epistemic modal expressions denote the subjective evaluation of the speaker whereas others indicate the *objective probability* of the event. However, the borders are blurry, and the distinction is not always significant for the interlocutors. Nuyts (2001b) suggests that differentiation between subjectivity and intersubjectivity is even more important than of subjectivity/objectivity. He clarifies the two ways of differentiations in modal expressions as:

1. Subjective vs. objective: The use of a modal expression is objective if it is based on highly reliable evidence, whereas it is subjective if the evidence is less reliable.

2. Subjective vs. intersubjective: The use of a modal expression is intersubjective if it is based on evidence which is shared between the speaker and others, whereas it is subjective if the evidence is held by the speaker alone. “the quality of the evidence probably matters less than the fact that it is evidence only available to the speaker, not to the hearer (2001b: 394)”.

The concept of subjectivity has been discussed in cognitive grammar in two senses. First, all use of language is considered subjective, because all utterances present a specific ‘construal’ of reality, and therefore cannot be objective. However, we can consider a scale of subjectivity and different extents of subjectivity. The second CG account for subjectivity is related to the concept of Ground and its elements. In Langacker’s (2008) use of the term ‘subjectivity’ the important factor is if the reference to elements of Ground are explicit or implicit (offstage vs. onstage). If the elements of the Ground (the speaker, the hearer, time and place of speaking) remain implicit in an utterance it means they are more subjectively construed. Epistemic modals are considered subjective, because they evoke some facet of the Ground without mentioning it explicitly. However, this does not mean that effective (non-epistemic) modals are objective, rather they are less subjective in a scale. For example, in permission function of modal verbs, since one of the elements of the Ground, the hearer is explicitly “on stage” a degree of subjectivity is observed in the utterance, albeit less than that of epistemic modals.

2.4 Agent-oriented vs. Speaker-oriented modality

In their cross-linguistic studies, Bybee, Perkins, and Pagliuca (1994) and Bybee and Fleischman (1995) note different limitations with the traditional classification and terms *deontic* and *epistemic*, and instead use the terminology: “agent-oriented modality”, “epistemic modality”, and “speaker-oriented modality”. According to them:

Agent-oriented modality encompasses all modal meanings that predicate conditions on an agent with regard to the completion of an action referred to by the main predicate, e.g. obligation, desire, ability, permission and root possibility (Bybee and Fleischman 1995: 6).

In *speaker-oriented modality*, the speaker imposes some necessity or possibility upon the addressee. This includes directives, imperatives, prohibitions, optatives, admonitions, and permissions. Thus, for Bybee et al. (1994), the main criterion for classifying modals is the factor that enables completion of the action. If it is the speaker, then the modality is considered speaker-oriented, otherwise it goes under the class of agent-oriented modality. Therefore, statements that describe obligation and permission are labeled “agent-oriented” while imperatives and other statements that impose conditions of obligation (speech acts) are categorized under “speaker-oriented” modals.

Epistemic modality in their classification have its traditional definition: “epistemics are clausal-scope indicators of a speaker’s commitment to the truth of a proposition” (ibid). Different kinds of epistemic modality are defined as *possibility* indicates that the proposition may possibly be true; *probability* indicates a greater likelihood that the proposition is true than possibility does; and *inferred certainty*

indicates a stronger sense of probability, and strongly implies that the speaker has good reason for supposing that the proposition is true (1995: 179-180).

Bybee (1985) argues that this classification is compatible with general morphosyntactic tendencies across languages by which agent-oriented modality is more likely expressed by verbs, auxiliaries or non-bound particles, whereas speaker-oriented and epistemic modals are often expressed inflectionally. According to Bybee and Fleischman (1995), agent-oriented modality encompasses what is being called ‘deontic’ or ‘root’ modality in older approaches. They use ‘deontic’ to refer to modals marking conditions imposed by someone in authority. Bybee et al. (1994) also introduce a separate category of subordinated modality, a type of modal marker that appears in concessive and purpose clauses. Subjunctives and other markers associated with purposive and concessive clauses fall under this category.

In their cross-linguistic approach, Bybee et. al. (1994) show how using a similar form for future tense and for a kind of modal marker is a common phenomenon among different languages. In fact, in many languages, the neutralized form of the verb is used as in its present tense and the future marker can be interpreted either as the tense marker or as a predictive or even intention marker (modal). They suggest that multifunctionality of some irrealis markers to be used for future, desire and obligation has to do with the mental reality that in many contexts, an intention is expressed by means of expressing a desire or an obligation which entails a prediction about an action occurrence in the future.

Other aspect of modality markers discussed by Bybee (1995:504) is how the modals lose their temporal meaning gradually. The English past modals *could*, *should*, and *might*

have reduced their temporal meaning over time, and have received a non-factuality sense instead. She argues that the interaction between temporality and modality produces the modal meaning of non-factuality.

2.5 Pragmatic-discourse functions of modals

As Bybee and Fleischmann (1995:3) stated, “many of the functions of modality are inextricably embedded in contexts of social interaction and, consequently, cannot be described adequately apart from their contextual moorings in interactive discourse”. In fact, modality semantic domains are dependent on the context. Speakers decide what modal marker they need in their utterance not only based on the finite clause’s meanings, but more often based on the discursive purposes that function beyond the sentence. This is a reason for multifunctionality of modal markers and also for the ongoing semantic change that happens over time on modal markers.

In her study on polysemy in English modals, Sweetser (1990) suggested that modals might acquire a third sense, other than root or epistemic meanings in regard to their function in conversation (example 1).

(1)

a. John may go.

b. John may be there.

c. He may be a university professor, but he sure is dumb.

In 1c the modal *may* is meaningful only in the discursive context. She uses the term “sociophysical world” for the semantic area in which root modals relate to as opposed to “world of reasoning” in which epistemic modals work. Then she introduces another kind

of meaning that appears only in the “conversational world” as in example 1c. She distinguishes ‘speech act use’ of modal verbs from epistemic use. Thus, according to Sweetser (1990:61,70), modal verbs can be analyzed in three levels: root modality, epistemic modality and speech act modality. She states that part of ambiguity and polysemy of modals is a matter of pragmatics and not semantic (Sweetser 1990: 65–68).

Sociophysical world, in Sweetser’s account is a concrete, basic domain that functions as a departure for metaphorical extension of modals to the epistemic domain which is more abstract. A similar point of view on modals is Wierzbicka’s (1987) who has a discourse-pragmatic approach towards English modals as well. She discusses modals as linguistic forms representative of semantic primitives. By semantic primitives, she means universal concepts such as mental predicates and speech predicates that are expressed in all languages. According to Wierzbicka (1987: 38) the polysemy of modals is related to the contexts they appear. She states that different meanings of modals have more to do with the context, either explicit or implicit, than with the meaning of the modal as such.

2.6 Participant-internal vs. Participant- external modality

In a typological study, van der Auwera and Plungian (1998) outline a modality semantic map and explain universal possible ways that modality is expressed in languages. They define modality as “those semantic domains that involve possibility and necessity as paradigmatic variants, that is, as constituting a paradigm with two possible choices”. In their framework, they do not include evidentiality as a subdomain of modality. However, they consider evidentiality and epistemic modality in a shared area of *inferential*. They

categorize modalities with respect to whether the source of necessity or possibility is external or internal to the agent. There are four modality categories in this framework: participant-internal, participant-external, deontic, and epistemic.

Participant-internal modality refers to a “kind of possibility or necessity internal to a participant engaged in the state of affairs” (Van der Auwera and Plungian 1998:80). As it is shown in example 2, internal capacities and abilities of the subject participant are source of possibility, and internal needs are sources of necessity in this domain. Participant-internal modalities can be divided into two types of physical or intellectual possibility and necessity.

(2)

a. Boris can get by with sleeping five hours a night.

b. Boris needs to sleep ten hours every night for him to function properly. (1998:80)

Participant-external modality refers to circumstances that are external to the participant engaged in the state of affairs, and that make the state of affairs possible or necessary (example 3).

(3)

a. to get to the station, you can take bus 66.

b. To get to the station, you have to take bus 66. (1998:80)

Subcategories of participant-external modality are weak obligation or strong obligation. Van der Auwera and Plungian point to the close relationship between

participant-external modality and deontic modality, Thus, in this framework, deontic modality becomes a subdomain of participant-external modality that is related specifically to social norms or an authority who imposes the condition of possibility (permission) or necessity (obligation) for the completion of an action (example 4).

(4)

a. John may leave now.

b. John must leave now. (1998:81)

Thus, permission and obligation are special cases of participant-external modality in which the possibility or necessity are imposed by a person of authority or an institution. In the deontic domain, permission is deontic possibility (4a), and obligation is deontic necessity (4b).

Epistemic modality is identical with what has been defined traditionally: the speaker's judgement about the degree of certainty or probability for an event to be realized (example: *John may have arrived*). Both participant-external and participant-internal concern aspects internal to the state of affairs that the proposition reflects whereas epistemic modality concerns (has scope over) the whole proposition (1998: 82).

Unlike Bybee et al. (1994), Van der Auwera and Plungian (1998) do not include desire, intention, and willingness in their study and limit modality to two domains of necessity and possibility. They also exclude imperatives, prohibitives and optatives (speaker-oriented in Bybee et al. (1994)) from the modality domain and consider them as “pertaining to illocutionary type” (1998: 83). Table 1 illustrates the concepts and categorization of modality in van der Auwera and Plungian (1998).

Possibility			
Non-epistemic possibility			Epistemic possibility
Participant-internal possibility	Participant-external possibility		
	Non-deontic possibility	Deontic possibility	
Participant-internal necessity	Non-deontic necessity	Deontic necessity	Epistemic necessity
	Participant-external necessity		
Non-epistemic necessity			
Necessity			

Table 1. Modality types (Van der Auwera & Plungian 1998: 82)

2.7 Modality in Cognitive grammar framework

Langacker (1991) analyzes modality through the concept of reality in a cognitive model. According to the *reality model*, reality is characterized as a path evolving through time. “Reality is neither simple nor static, but an ever-evolving entity whose evolution continuously augments the complexity of the structure already defined by its previous history” (1991: 243). Affairs in our world have unfolded in a particular way out of all other conceivable ways. There has been a certain course of events, whereby certain events and situations have occurred, while countless others have not. A particular conceptualizer (C) accepts some situations or states of affairs as being real, and some other situations not. The accumulation of all real/not real situations through time shapes the conception of established reality for the conceptualizer. Future events thus are not part of reality because they have not been established.

Figure 1 shows the growing nature of reality where the conceptualizer is located at the leading edge of the expanding structure. The vantage point from which the conceptualizer views things is called ‘immediate reality’ or present reality. A key notion is that a particular speaker/conceptualizer has her own take on the history of evolving reality which includes past and present events. Thus, our understanding of reality is partial and imperfect. Irreality comprises everything other than reality which is either projected reality or potential reality. Irreality – just like reality- is dependent to the conceptualizer and not the actual world (Langacker 1991: 243).

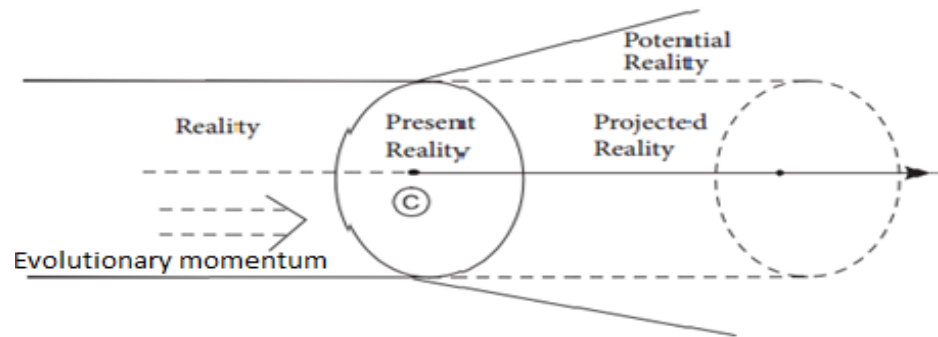


Figure 1. Dynamic evolutionary model (Langacker, 1991, p. 277)

The presence or absence of modal markers shows whether the speech act participants accept the designated process as a matter of established reality. Thus, in the epistemic model of reality, the modals can be explained based on the speaker’s knowledge. The statement without modal markers indicates that the speaker accepts the designated process as part of reality whereas the presence of modal markers places, or *grounds* the statement in the realm of irreality (1991: 245).

Modality in cognitive grammar is discussed in terms of *grounding*. The term ground is used in CG to indicate the speech event, its participants (speaker and hearer), their interaction, and the immediate circumstances (the time and place of speaking). As definite articles and deixies that are grounding elements of nominals by singling them out, modal and tense markers are grounding elements for finite clauses.¹ Therefore, modality in CG is considered one of the ‘grounding devices’ of the finite clauses, similar to tense. By ‘grounding device’ Langacker (2008) means grammatical means by which the conceptualizer anchors the referents to the speech situations. In a finite clause, a verb, which is a type of process is combined with grammatical or grounding devices like tense and a modal verb in order to instantiate a specific event in relation to speaker, hearer, and to the time and place of the speech. All grounding elements, either for nouns or verbs, are related to the knowledge statues of situations from conceptualizer’s point of view. The knowledge statues, in its turn has to do with the cognitive concept of reality which is actually “known reality” in Langacker’s account (1991: 245). For example, an event may be conceived as part of projected reality, or in the potential reality (modality or subjunctive mood) by the speaker.

According to Langacker (2008: 304), “Modals ascribe to their trajector some kind of propensity, or ‘potency’ which – when unleashed – can lead to its execution of an action (V). While the situations described by these verbs are therefore stable [...], they do involve

¹ This worth mentioning that the idea of nominal and clausal grounding in CG is very similar to some early Greek grammarians’ account. They considered what mood (grammatical manifestation of modality) does to verbs, as counterparts to what cases do for nouns (Lallot 1989: 162 from van der Auwera and Aguilar 2016: 13).

some kind of force tending towards V's occurrence.” Instead of root modal or deontic modal, Langacker uses the term “effective” to refer to non-epistemic modals.

Talmy's (1985) theory of force dynamic, which deals with the interactions of entities with respect to force, has been one of the important theories applied in analyzing modality in CG literature. Force dynamic, which initially was meant to offer a conceptual system for understanding the notion of “causative”, deals with the notion of ‘force’ and the way this notion is reflected in language. Theory of force dynamic explains two basic entities or forces and their interactions in physical, social, and mental world. Any utterance in language describing a rest or an action situation, in fact is implying an interaction between an Agonist and an Antagonist. In this framework, different modal verbs can be analyzed in terms of opposing forces. Based on Talmy (1985: 296), social interactions like obligation and permission are expressed in language by means of physical force concepts. Moreover, Talmy offers a semantic analysis of epistemic modality as metaphoric extension of deontic modality. In this framework, people's conceptualization of different layers of life (physical, social, and mental) are based on their understanding of the kinesthetic system.

Langacker (2013, 2016) explains English modal markers in the notion of **control cycle** (Figure 2) which is very similar to Talmy's force dynamic. Modals reflect the potential phase of the control cycle. They represent the conceptualizer assessing a potential new occurrence which is not part of the conceptualizer's reality domain but which she strives to control. In the control cycle model, there are four phases regarding the agent (A), its dominion (D) and a new occurrence or target (T). The agent's dominion is what is already under its control. The presence of modal markers indicates the Potential phase

(pane 2) of the control cycle in which the conceptualizer is to influence the evolution of reality by deciding whether or not to include T in the dominion.

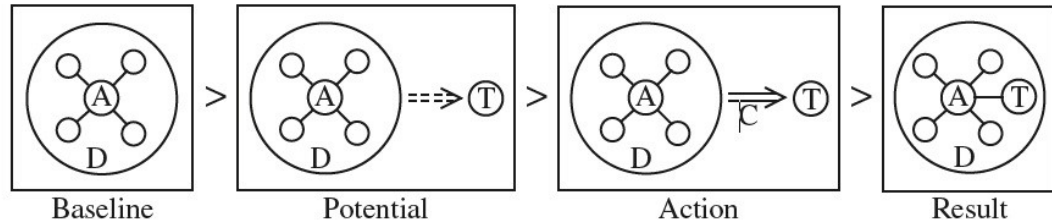


Figure 2. The control cycle (Langacker 2016)

Control cycle's manifestations can be physical, perceptual, mental or social. This model provides an abstract basis for analyzing different linguistic structures, including modals. For example, many epistemic modal instances in language can be seen as potential phase of the control cycle in the mental realm in which the conceptualizer does assessment or evaluation of state of affairs.

2.8 Grammaticization

Grammaticization paths through which modal markers develop and change (semantically and phonologically) has been a focus of research in many studies (Bybee, Perkins & Pagliuca, 1994; Heine, Claudi & Hünemeyer, 1991; Hopper & Traugott, 1993), and contributed much to our understanding of modality. These studies have traced language modal markers to their origin, both semantically and phonologically and reveal language change diachronically. Many modal markers in different languages have a basic root

meaning and an epistemic meaning. This leads to polysemy and in many cases to vague interpretation and metaphorical meanings for modal markers.

Traugott (2011) designed two key questions in her historical study of modality that lead us to the domain of grammaticization. The questions are:

“Q1. Cross-linguistically, are there identifiable semantic subcategories of modality?

Q2. If so, can generalizations be made about which subcategories of modality develop later than others?” (2011, 381)

Bybee (1994) shows that the modal and auxiliary verbs that express possibility in many languages originate as lexical items with the meaning of physical ability. In the pathway toward becoming a grammatical marker, the physical ability sense extends to general ability. Examples of this process have been shown in *can* and *may* in English, *pouvoir* in French and *poder* in Spanish. Some lexical sources mentioned in the literature (van der Auwera and Plungian 1998, Bybee et al. 1994), for development of modal markers are lexical items with the meaning of “be strong”, “know”, “arrive at”, “finish”, and “suffice” for participant-internal possibility; “need” for necessity, “be permitted” and “dare” for deontic; “have”, and “be supposed to” for participant-external necessity; “owe”, “duty”, “belong”, “be good”, “prosper” for deontic necessity. (from Ziegler 2016:391).

By analyzing different implications of *can* in English, Bybee (1994:190-192) argues that since most activities that require mental ability also require some physical ability, meaning transition from mental ability to general ability is easy to understand. Another step is the generalization from meaning of ability (mental and/or physical) to root

possibility. In this step, some components of meaning related to agency are dropped and some external features take roles in the possibility of completing an action. A proposed explanation is that in completing any action there are agent abilities and external possibilities involved. Therefore, in three stages of meaning change, *can* predicates that

- (i) mental enabling conditions exist in the agent
- (ii) enabling conditions exist in the agent
- (iii) enabling conditions exist

for the completion of the main predicate situation.

Enabling conditions might be physical and/or social. The permission meaning of root possibility is related to social conditions (Bybee, 1994: 192-3). Thus, through different stages of grammaticization, the agency meaning of a form might be dropped over time. Moreover, it has been shown that a modal marker expressing ability would not move directly to the expression of permission without also being able to express root possibility (1994:193).

Giving cross-linguistic evidences, Bybee (1994) also shows a further independent path of agent-oriented modals out of which epistemic function of possibility modals develop. The observed regularity among different languages lends support to the hypothesis that grammaticization paths are universal and predictable on general semantic principles. The general pattern of semantic change paths for epistemic possibility modality is shown in figure 3.

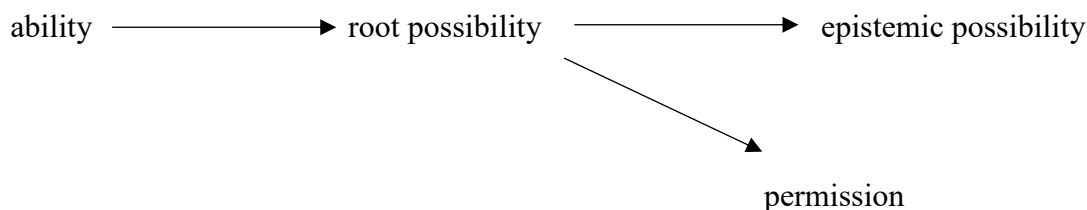


Figure 3. A path to epistemic possibility (Bybee, 1994: 199)

Van der Auwera & Plungian (1998) also, in their semantic map of modality, discuss possible paths of grammaticization from a pre-modal meaning to a modal meaning. They show that possibility and necessity modals can be traced back to the verbs of specific semantics domains such as motion, happenstance, cognition, possession and ontological states. They describe the possible paths for deontic and epistemic meanings to develop out of participant-external meaning of modals in different languages. According to their study, vagueness (ambiguity) among different readings of the same modal may indicate an ongoing grammaticization process, because two or more different meaning-functions of one single form might co-exist in the language. This phenomenon gives us synchronic evidence of a change through the time (1998: 100).²

Langacker (1990, 1991a, 1999, 2003) also points to grammaticization processes in his analysis of English modals. In his account, modals acquire subjectification throughout the time in parallel to the cognitive tendency in connecting the real-world physical forces to epistemic counterparts. Modals then become grammaticized or “grounding predications” i.e. they relate the utterance to the ground (temporal, spatial and interlocutors’ situation).

² However, ‘modal polyfunctionality’ which refers to the case that a modal has both epistemic and non-epistemic meaning has been shown to be a typical characteristic only in ‘Standard Average European’ languages and it is not a common phenomenon in most languages (van der Auwera et al. 2005: 247, 256).

2.9 Modality in signed languages

Unlike studies on spoken languages, modality studies on signed languages is rare and has been done only in a limited number of languages. This section gives a brief review of findings in the modality studies on signed languages. As other linguistic studies on signed languages, the most described signed language in terms of modality is ASL (Wilcox and Wilcox 1995, Shaffer 2002, Shaffer 2004, Janzen and Shaffer 2002, and Wilcox and Shaffer 2006). There has been some research on eight other signed languages so far with modality investigations. Studies have been done on modality in Brazilian Signed Language (Ferreira 1990, Xavier & Wilcox 2014), Spanish Sign Language (Iglesias Lago 2006, Herrero-Blanco & Salazar-García, 2010, Cabeza-Pereiro 2013), Catalan Sign Language (Shaffer, Jarque & Wilcox 2011), German Sign Language (Pfau & Quer, 2007), Irish Sign Language (Herrmann 2007), Russian Sign Language (Borodulina 2012), Italian Sign Language (Gianfreda et. al, 2014), and Austrian Sign Language (Lackner 2017).

Some of the issues that have been addressed in previous studies of modality in signed languages are the role of non-manual markers, manner of hand movement, the position of modals in an utterance, grammaticization of modal markers and, the interaction between negation and modality. A review of some of the important findings in the studies on modality in signed languages is presented in this section.

2.9.1 American Sign Language (ASL)

Using the two general categories of root and epistemic modals, Wilcox and Wilcox (1995) gave a first description of modal verbs in ASL and discussed their semantics and hypothesized grammaticization pathways for ASL modal development. CAN is the ability

modal and SHOULD and MUST are necessity modals expressing weak and strong obligation, respectively. They also suggested that epistemic modality is expressed by POSSIBLE, MAYBE, SEEM, FEEL and OBVIOUS in ASL. Wilcox and Wilcox (1995) showed how modal signs of ASL have been developed out of gestural bases. For example, a gesture enacting upper body strength is the root of the lexical item STRONG from which the modal maker CAN developed later.

Wilcox and Wilcox (1995) also discussed the iconic relation between strong and weak modal forms. Manner of movement corresponds to a continuum of weak to strong modal senses. ASL signs such as MUST, OBVIOUS, SEEM, FEEL, and CAN have alternate forms for weak or strong obligation, evidentiality, and possibility. The distinctions are marked by changes in manner of movement. Thus, the semantic difference between ‘should’ and ‘must’ in English are produced by different phonological alternation of the same lexical item in ASL. The same alternation has been described for CAN/POSSIBLE modals. The distinction in meaning is raised out of different movements of a single sign: a single firm movement for CAN and a double less intense and shorter movement for POSSIBLE. Manner of movement (e.g., slow reduplication for weak commitment or a single sharp movement for strong commitment) as a component in expressing modality in ASL has been studied also by Shaffer (2004).

Modal form development paths in ASL have been studied further in other studies (Shaffer 2001, Janzen and Shaffer 2002, and Wilcox and Shaffer 2006). These studies showed common grammaticization paths by which a lexical unit changes into a grammatical marker through time is observable in ASL as well. Moreover, another grammaticization path, also involved in sign languages, is development of grammatical

forms out of gestural roots. For example, the modal sign MUST and the epistemic sense of 'should' is shown to have a gestural root form used in mid-1800s in France for expressing monetary debt. It was later used as the verb 'owe' in old French Sign Language (OLSF) and then in modern LSF and ASL. The grammaticization path is

gesture 'owe' > OLSF verb 'owe' > LSF/ASL 'must', 'should' > epistemic 'should'

(Janzen & Shaffer, 2002: 211).

A more discourse-based approach in studying ASL modals has been adopted by Shaffer (2002, 2004). She studied modal markers of ASL both synchronically and diachronically and gave a semantic-pragmatic classification. The classification used in her study follows Bybee et al. (1994) and Bybee and Fleischman (1995). She also added more markers that are used in epistemic domain to the previous list. According to her, epistemic modality in ASL is expressed by the sign MUST/SHOULD, CAN/POSSIBLE, SEEM, FEEL, OBVIOUS, FUTURE, MAYBE, DOUBT and IMPOSSIBLE. These can appear in the preverbal position or at the end of a clause.

Shaffer (2004) offered an analysis of information structure in which the position of modal markers in an utterance shows the discourse characteristics of modals in ASL. The order in which ASL modal markers appear seems to be an important factor for interpreting them. Utterance-final position has more subjective interpretation in ASL, therefore this order is more commonly used for epistemic modals. The role of order is even more important in the case of the sign FUTURE. Preverbal uses of FUTURE are seen with facial gestures that add temporal information, while utterance-final uses of FUTURE are

epistemic, with concomitant facial gestures adding evaluative rather than temporal information. Generally, when ASL modals appear in utterance final position they have a more epistemic meaning. In these cases, higher speaker subjectivity is being interpreted. Along with the significance of modal position in an utterance, Shaffer (2016) explains how head nod and brow furrow adds epistemic senses to a sign. Changing the position of the sign SHOULD with no brow furrow and different head nod would change the epistemic sense to an advisability sense of the modal SHOULD.

2.9.2 Catalan Sign Language (LSC)

The expression of modality in Catalan Sign Language (LSC) has been analyzed in a comparative study by Shaffer, Jarque & Wilcox (2011). In this study, markers of necessity and possibility in LSC were discussed and compared with the expression of equivalent notions in ASL. Besides modal markers such as OBLIGAR ‘order’, NECESSITAR ‘need’ and PODER ‘can’, mental predicates such as CREURE ‘believe’ also is used in the modality realm of LSC. The significance of facial markers in expressing both epistemic and non-epistemic modals in LSC is discussed in this study. In another study on modality in LSC (Pfau & Quer, 2007) the authors discussed and compared the syntax of negation including affixation and non-manual markers in modal signs of LSC and German Sign Language (DGS). This study compared the structure of sentential negation in interaction with modal verbs based on hierarchical functional structure in these languages.

2.9.3 Italian Sign Language (LIS)

Gianfreda et. al (2014) described the signs expressing certainty and uncertainty and their functions and characteristics in LIS. The author analyzed the notion of modality in LIS and showed how facial expressions, such as frowning, add epistemic modal values to the utterance. Gianfreda also showed that the degree of confidence is graded by facial markers and manner of movement in LIS. For example, energetic fast movement of hands in sign IMPOSSIBLE indicates a stronger degree of evaluation of impossibility. Likewise, the expression of uncertainty is heightened by the use of certain non-manual components, such as bulging eyes, raised eyebrows and lips bent downwards (2014:222).

2.9.4 German Sign Language (DGS)

Apart from cross-linguistic study of LSC and DGS by Pfau & Quer (2007), there are other comparative studies on modality by Herrmann (2007). She showed the role of nonmanual factors in conveying modal meanings in DGS and compared these findings with those from Irish Sign Language (ISL). The eyes, eyebrow movement, head position, and other facial expressions are used in DGS to express modal meanings. This study focused on the comparison of modal meaning in spoken language and sign languages which coexist in a community (German and DGS in Germany, English and ISL in Ireland).

2.9.5 Brazilian Sign Language (Libras)

Ferreira Brito (1990) compared Libras (BCSL in her study) and spoken Portuguese to show that there is no one- to-one relation between modal markers in the two languages.

According to her, Libras has fewer modal verbs than Portuguese. Some different semantic domains in Libras are expressed with the same manual markers. However, to be able to give the same nuances, Libras has developed a mechanism in which the movement of the signs is varied. Articulation of manual markers with more or less energetic movements is important for the stronger or weaker sense of modality. The same modal sign can thus be used with different nuances. Ferreira Brito discussed alethic, deontic and epistemic modality in Libras and showed that verbs and auxiliaries are more often used to express modal meanings in this language rather than grammatical inflections. She also suggested that the position in which modal markers appear in the clause is an important factor in expressing epistemic and deontic modality.

Another study on modality in Libras was conducted by Xavier and Wilcox (2014). They analyzed expressions of necessity and possibility in Libras and suggested that “Libras modals seem to evolve out of lexical signs with a more concrete meaning and grammaticize, undergoing during this process meaning generalization and, in some cases, phonological change. This analysis also suggests that, in some cases, modals can be traced back to a gestural source” (Xavier & Wilcox, 2014: 477). Following Van der Auwera & Plungian (1998), they also found that polysemy and vagueness are important analytic tools for studying grammaticization in signed languages in the lack of historical evidence.

2.9.6 Spanish Sign Language (LSE)

In her PhD dissertation, Iglesias-Lago (2006) examines modal manual and non-manual signs in LSE. She analyzes modal meanings that are expressed by facial markers.

She shows how facial markers can express modal meanings even without an accompanying manual sign.

Applying a functional grammar framework, Herrero-Blanco & Salazar-García, (2010) discussed lexical forms with modal values in LSE. They analyzed markers of ability, obligation, volition, and evidentiality and showed that LSE modal markers are often placed after the main predicate.

In a diachronic study Cabeza-Pereiro (2013) studies the paths of grammaticization of modal markers in LSE. The study shows how some modal signs in LSE have gestural sources.

2.9.7 Russian Sign Language

Applying the semantic map offered by Van der Auwera and Plungian (1998), Borodulina (2012) described modal markers of Russian Sign Language in two categories of possibility and necessity modals. Epistemic modality in this language is shown to be expressed mainly by facial markers.

2.9.8 Austrian Sign Language (ÖGS)

Leckner (2018) described modality in ÖGS by categorizing modal markers into two groups of manual and non-manuals. She explained markers of eyes, lips, shoulder, body posture and head movements in detail and showed how these non-manual markers have

modality meaning. They either accompany only the modal manual signs or they cover the entire utterance conveying modality meanings.

Apart from the above studies dedicated on the expression of modality in signed languages, in some other studies on different issues, some manual and non-manual modal markers have been mentioned (e.g. Engberg-Pederson 2002 on Danish Sign Language, and McKee & Wallingford 2011 on New Zealand Sign Language). A summary of different issues addressed in different studies on modality in signed languages is presented in table 1.

	Non-manual markers	Grammaticization from lexical root	Grammaticization from gestural roots	Manner of movement	Modal sign position in sentence	Negation
Libras		Xavier and Wilcox 2014	Xavier and Wilcox 2014	Ferreira Brito 1990	Ferreira Brito 1990	
ASL	Shaffer 2004	Shaffer 1999	Wilcox & Wilcox 1995 Shaffer 2002	Wilcox and Wilcox 1995	Shaffer 2004	Shaffer 2000
LSC	Pfau & Quer 2007					Pfau & Quer 2007
DGS	Pfau & Quer 2007 Hermann 2004 & 2007					Pfau & Quer 2007
LSE	Iglesias-Lago 2006	Cabeza-Pereiro 2013	Cabeza-Pereiro 2013		Herrero-Blanco et.al 2006	
ISL	Herrmann 2007					
LIS	Gianfreda et. al 2014					
Russian SL	Borodulina 2012					
ÖGS	Lackner 2018					

Table 2. Studies on modality in signed languages

2.10 Grammaticization and modality in signed languages

Wilcox and Wilcox (1995) and Shaffer (2000) have suggested that the ASL and LSF modals CAN and POUVOIR have undergone different phases of meaning change similar to the grammaticization path that has been shown by Bybee (1994) for spoken language modals. The studies show that CAN has undergone a semantic generalization from the sense of physical strength to general strength by the early twentieth century. The historical evidence shows that in this period, CAN was used for physical and nonphysical ability and also as a root possibility marker. In modern ASL two more functions are also evident: permission use of CAN and epistemic use of CAN. According to Shaffer (2000), epistemic CAN is a new usage of this sign in ASL, a result of semantic extension from the root possibility use of CAN.

Wilcox (2007, 2009) explains two types of grammaticization pathway through which gestural resources come to express grammatical functions in the language. The source of some modal signs is shown to be lexical items as it has been shown in spoken languages. The lexical items undergo a semantic extension, thus a grammaticization path through which modal markers develop. Another path of grammaticization happens when manner of movement of some gestural resource undergoes cognitive processes by which grammatical markers develop. “Codification of gestural manner of movement and facial expressions leads to the linguistic expression of prosody and intonation, which then may grammaticalize directly into a wide variety of grammatical markers” (Wilcox 2009: 108)

Janzen and Shaffer (2002) show that ASL modals such as CAN and MUST have developed from pre-linguistic gestures. In their study of ASL and LSF they show that ASL

modals underwent lexical intervening stages in the past. The modal verb CAN has originated from a lexical sign meaning ‘strong’ or ‘power’ which in turn, has a gestural root. While in 1913 STRONG and the modal verb CAN were signed in a very similar manner, present-day CAN, has undergone some phonological changes; in particular, the orientation of the hands has changed (Shaffer 2002). The modal sign MUST in ASL and the epistemic sense of ‘should’ is shown to have a gestural root form used in mid-1800s in France for expressing monetary debt. It was later used as the verb ‘owe’ in old French Sign Language (OLSF) and then in modern LSF and ASL. The grammaticization path is

gesture ‘owe’> OLSF verb ‘owe’> LSF/ASL ‘must’, ‘should’> epistemic ‘should’
(Janzen & Shaffer, 2002: 211).

Another modal marker with gestural root is ASL epistemic modal FUTURE. This sign, as it has been discussed earlier has two meanings/functions: future marker and epistemic modal. This sign is thought to have developed from a gestural source in classical antiquity until today around Mediterranean which used to indicate departure (Shaffer 2000; Janzen and Shaffer 2002; Wilcox and Shaffer 2006; Wilcox 2007). According to Shaffer (2000) a similar form was in use in ASL with two meanings of ‘to go’ and ‘future’ concurrently by the early twentieth century. This is an example of layering which is a common phenomenon in the grammaticization process (Hopper 1991). The sign then underwent different semantic and phonological changes over time. As a result of the changes, the sign FUTURE is articulated near the cheek and it cannot be interpreted as a verb of motion in modern ASL. The other phonological change that is seen in the epistemic meaning of FUTURE is added facial markers that indicate the epistemic stance of the signer. (Shaffer 2016).

The grammaticization paths are claimed to be universal and predictable. Although we need diachronic data in order to explore grammaticization paths, they can also be inferred from synchronic data (Bybee et al. 1994: 17, Heine et al. 1991, van der Auwera & Plungian 1989: 111). When a new meaning develops out of a previous form-meaning pair, the first form-meaning pair does not necessarily disappear from the language. This explains why modal forms are commonly polysemous. Vagueness or ambiguity among different readings of the same modal may also help us to track an ongoing grammaticization process (Van der Auwera & Plungian 1998: 100). This approach is helpful to find grammaticization paths in synchronic data, especially in case of sign languages with lack of sufficient historical data.

Chapter 3

3 Data and Research Method

3.1 Research questions

Since the domain of modality studies is vast in the literature, one should initially establish the boundaries of the domain of study. A traditional definition is that modality is the semantic domain of expressing necessity and possibility (Kratzer 1978; van der Auwera 1996). What follows is a study for finding markers of necessity and possibility in ZEI. Further, it is a study that explores the role of facial grammar in the area of modality in ZEI. I gathered and analyzed data with the following questions in mind:

1. What manual signs in ZEI convey the meanings of necessity and possibility?
2. What facial markers in ZEI convey the meaning of necessity and possibility?
3. What are the semantic subdomains of each modal marker?
4. How facial markers of modality interact with manual signs?

3.2 Research Method

The aim of this study is to describe ZEI markers of modality. A corpus of conversational data, along with some public videos were analyzed to determine the markers of modality in chosen utterances based on their meaning in the discourse context. Two

fluent ZEI signers conducted the conversation settings and did the interviews. Each example and its semantic interpretation were discussed with a native ZEI signer to be verified. He also helped to gain information that was not found in the data.

3.2.1 Methods & Data

The data used for this study came from two resources: an interview survey and public videos on social media. Following Xavier & Wilcox (2014), in order to elicit ZEI modals expressing necessity and possibility, I designed an interview survey with the aim of covering the semantic map of each modality domain. The survey (→ appendix) included 21 questions designed to elicit answers with modals expressing the same meanings discussed by Shaffer (2000) and Wilcox & Shaffer (2006). In order to design more naturalistic conversation setting, eliciting questions were asked after some introductory questions about the same topic.

Two consultants, both fluent ZEI signers, conducted the interviews. The aim of the study was explained to them first. The way they could manipulate or modify each question of the survey based on the participant's life and situation was discussed before the interview sessions. For example, if the question was about the work place and the relation with one's boss, the interviewer could change it to family members' relations in case the participant is unemployed. The interviewers were also told not to use target signs in their questions.³ The interviews were done in absence of the researcher who is not a native or signer.

³ This rule has been broken in many cases. Because at the time of designing this study, I had only thought of manual signs. Later, at the advanced stages of analyzing the data, I realized that the interviewers have

The participants were eight deaf adults, three women and six men, who use ZEI on a daily basis and/or in different social contexts. They all are active members of the Tehran deaf club. Two of them have deaf spouses. Some interviews were conducted in the participant's homes, some in the consultant's homes and some in the consultant's office, all in Tehran, Iran. The camera was set to catch both the interviewee and the interviewer, so the discourse context can be analyzed in the video data. In addition to the data collected through the interviews, I gathered more data from videos made and published by Iranian deaf individuals on social media. The subject of these public videos were real or imaginary stories following by a moral, jokes, or love stories.

3.2.2 Data Analysis

Instances of modal expressions taken from collected video data (including around 10 hours of conversations) were analyzed. Modal expressions did not appear in many of the expected occasions. However, many modal concepts were observed in some other contexts that were not anticipated. Instances of modal expressions taken from public videos also were analyzed. Based on the context and the discourse in which the modal concepts were found, the utterances were evaluated and classified in different semantic categories based of the research frameworks (Van der Auwera and Plungian 1998 and Langacker 2013).

used many facial modal signs (mainly epistemic) without being aware of that. Even, if the signer is aware of the modality meaning of facial expressions, it is harder for them to control the face while signing.

3.2.3 Glossing and transcription conventions

Except for the modal signs, all other signs are transcribed by using English glosses. I preferred using Farsi glosses for the modal signs, mainly to avoid confusion with the meaning and functions of both English and ASL modals. The Farsi gloss that is chosen for each modal sign is the most frequent Farsi word which is used when signers mouth a Farsi word along with a particular sign. For example, a manual sign with 1-handshape form moving downward is a common sign with the English meanings of ‘should’, ‘must’ and ‘have to’. The mouth pattern accompanies this sign, in most cases, is the pattern of the Farsi word ‘bayad’. Thus, I gloss this sign as BAYAD.

The following conventions were considered in glossing the signs:

- 1- The glosses are associated only to the manual signs and not to the body or facial markers, which often contribute to the meaning of a sentence. In cases that the facial activities were important for analyzing modals, they are mentioned and explained in the text.
- 2- Certain signs may combine many meanings simultaneously, and for these it is sometimes hard to find an appropriate English word to describe them. In these cases, the description of the sign was given in lowercase letters and preceded by “@” (e.g., @looking through the window).
- 3- All of the verbs are glossed in their base form regardless of their person, tense, or other grammatical feature.
- 4- Regarding the pointing signs, since their linguistic analysis does not have effect on the purpose of this study, pronouns and deixis are used as their glosses.

- 5- There are signs that can be translated into English by more than one word. In this case the character _ was used to indicate them as one lexicon in ZEI. For example: NOT_EXIST is used for a single sign.
- 6- For fingerspelling signs, the English spellings of a word is used. For example, O-W-E means a Farsi word with the meaning of English “owe” is finger spelled.

Chapter 4

4 ZEI modal markers

Five manual modal markers in the necessity domain and six markers in the possibility domain were found in the video data. BAYAD, MAJBUR, MIKHAM, MOHEM and HATMAN are ZEI necessity modal signs. BAYAD is the most frequent among them and covers more semantic domains. MISHE, MITUNE, BALAD, RAHAT, SHAYD and MOMKEN are ZEI possibility markers. In this chapter, ZEI manual modal markers are analyzed and categorized based on the semantic classifications offered by van der Auwera and Plungian (1998).

4.1 ZEI Necessity Modals

4.1.1 Participant-external necessity: BAYAD, MAJBUR, MOHEM

As described by van der Auwera and Plungian (1998), participant-external necessities refer to any modal uses in which the source of the condition is external to the agent. A vast domain of participant-external necessity is expressed by manual BAYAD (figure 4) along with different facial markers. An example is shown in (5).

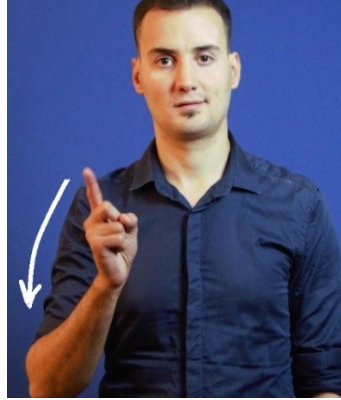


Figure 4. *BAYAD*

(5)

BEFORE VISA GET THEY SAY YES CAN IF TIME WORK_OFF O-W-E
HAVE CAN USE, NO **BAYAD** GO BOSS BOSS

“Before I got the visa... they told me: “you can (get some days off). If we owe you your regular paid leave, you can use them. If not, then you **have to** see the boss and some other officials.”

The topic of the conversation from which this except is taken was work regularities. BAYAD in this example, has a participant-external meaning. Because the source of the necessity is external to the agent, the agent needs to figure it out by seeing and talking to some authorities. A requirement for him to be successful in getting some days off the work is to go and talk to his boss and others.

Strong necessity

Some modals describe a condition of strong necessity with a source of necessity that is not internal to the agent. BAYAD with a tense articulation or a more energetic movement is used for expressing strong necessity as in example 6.

(6)

QUICK BREAK NO ONE _DAY TWO _DAY THREE _DAY WHAT WORRY **BAYAD**
BREAK I GO SEE WHAT

“I’m not saying that I would break the door quickly, no. But after one, two, three days [not hearing from a friend] I **have to** to break the door, get in and see what has happened.”

This excerpt is taken from conversational data, where the interviewer asked about a hypothetical situation in which a friend does not open the door even though he/she is known to be home. The signer first answered he would break the door and get in. The interviewer was surprised and asked him if he would break people’s door so easily (in a joking manner). Then the signer produced example 6 to emphasize that in an emergency he would do that. Here BAYAD is an instance of strong necessity which is forced by an external source. Brow furrow accompanies the sign BAYAD in this example.

For occasions of expressing desperation or no choice for the participant, MAJBUR (figure 5), with two different forms, was the most frequent modal marker indicating a strong external obligation. Both obligation sense and the external sense of MAJBUR are stronger than of BAYAD, as it is shown in (7).

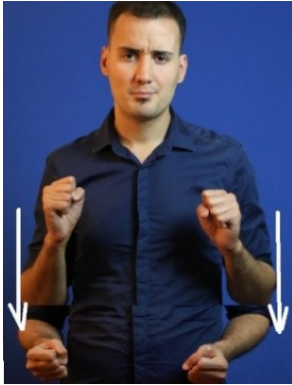


Figure 5 MAJBUR-1



MAJBUR-2

The contexts in which MAJBUR appears are similar to what is labeled as root necessity in the literature, that is the source of obligation is not a person or an institution, rather the general circumstances.

(7)

I KARAJ GO-BACK GO-BACK PARENT KARAJ LIVE
THERE I TEHRAN SCHOOL CLASS ELEVEN DIPLOMA
TAKE-NOT ELEVEN FINISH BECAUSE GO-BACK GO-
BACK SNOW RAIN PROBLEM EXIST BUT HOUSE SLEEP
PROBLEM HOUSE UNCLE TWO YEAR LIVE THEN
HOUSE AUNT UNCLE THERE THERE I COMFORTABLE
NO BOTHER COMFORTABLE NO **MAJBUR** EARLY
MARRY

“My parents used to live in Karaj and my school was in Tehran. I always traveled back and forth this long distance. I finished grade 11 and didn’t continue schooling. I didn’t get diploma. Because it was difficult for me to go and return the long way in snow and rain. I lived with my uncle for two years, then my aunt, but I didn’t feel comfortable. I didn’t want to be a bother. So,

because of all the problems, I **had to** (was obliged) to get married at an early age.”

In this discourse segment, MAJBUR indicates a necessity or obligation placed on the agent from the general circumstances. There is no clear internal or external condition being placed on the agent by some other person or authority. In fact, life difficulties for continuing education, made the woman stop schooling and consequently get married at an early age. Another example of MAJBUR is shown in (8).

(8)

GAS NOT_EXIST MAJBUR TAXI SIT GO

‘If I run out of gas, I **have to** take a taxi.’

Here the signer was explaining what she would do in case her car stops in the middle of the street. Again, the external source of obligation is the general situation and MAJBUR indicates that the participant has no other choice.

Deontic necessity

Deontic necessity in Van der Auwera and Plungian (1998) framework encompasses those participant-external necessities in which the source of the condition is in some position of authority or social norm⁴. This sense of necessity is very common when people are discussing their school regulations and rules as well as when they are talking about the

⁴ Shaffer (2000) uses the term authoritative necessity to avoid confusion around the term deontic, because deontic has been used to label many different concepts in the modality literature.

experiences they have had with police or other legal authorities. BAYAD is also used in this sense of necessity, as in example 9.

(9)

NO NOT_ALLOWED TOMORROW EXAM TAKE **BAYAD** ALL KNOW Aff⁵

(teacher said): No, [it is not accepted], tomorrow I'll give you an exam and you **must** know all [the book].

Here the signer explains how his teacher was strict with the class. He was talking about a situation in which students would beg the teacher to reduce the number of pages they needed to study for the exam, but the teacher would not accept that request. Thus, the necessity is an external requirement for the student and is not something the agent of the clause (students) is requiring of themselves. Brow furrow accompanies BAYAD and it spread over the other signs afterward. It indicates the strength of obligation. The function of brow furrow is discussed more in chapter 5. Another example of BAYAD in its deontic or authoritative sense can be seen in example (10).

(10)

FATHER SAY THERE WEDDING HALL **BAYAD** BOY GIRL SEPARATE

The father said: the wedding party hall must be separated by gender (female guests in a separate hall).

⁵ Affirmative marker is a B handshape moving downward.

In (10), taken from a video published in social media, the signer was telling a story about a religious father who does not accept his son's wedding party taking place in a gender mixed hall. Sentence (10) is followed by a conditional sentence by which the father conditioned his presence in the wedding party to a gender separated case⁶. Considering father as being in the highest position in the family, especially regarding norms and practices of life, example (10) also might be an example of deontic strong obligation. The common facial marker in (9) and (10) is a brow furrow simultaneous with BAYAD manual articulation.

External weak necessity: Advisability

This category is used for a subdomain of necessity by which the purpose of the utterance is to indicate a benefit of an action for the agent if she does the action with no sense of obligation or requirement. In fact, the speaker gives her opinion about some situation and what could or should be done to improve that state of affairs. In ZEI, advisability is expressed with manual signs BAYAD and MOHEM (figure 6) and with the imperatives.

An example of the use of BAYAD for expressing participant-external weak necessity in the advisability sense is shown in (11). Here the interviewee is giving advice to the interviewer who has talked about his migraine.

⁶ Conservative families in Iran plan the wedding parties in two different halls, one female only one male only.

(11)

BAYAD GO DOCTOR

“You **should** go to the doctor”

The fact that no brow furrow was produced along with BAYAD in example 11 can be another indicator of weak necessity.

Advisability is also expressed by MOHEM (figure 6) as it is shown in (12). In this segment the signer is discussing her opinion about parent’s duties. The interviewer question was: “which one is better? The parents decide about their child’s outfit and hair style or the child herself/himself?”

(12)

PARENTS MOHEM

“Parents **should** do that”

CHILD SAY HAIRCUT EVERYTHING HE WORK HE WORK CORRECT
NOT

“it is not correct to leave the child to do whatever he wants about the hair style and everything”

MOHEM PARENTS THEY GOOD TEACH CHILD HE GROW STUDY A-
G-E EIGHTEEN HE THINK REACH ALL WORK SELF Aff HAIR_CUT
WHATEVER SELF HE, **MOHEM** CHILD **MOHEM** PARENTS TEACH
CHILD

“Parents **need** to raise their kids well, the kids study and grow until the age like 18 when their mind reaches the point where they decide for their appearance themselves, but when they are little it **needs** to be the parents’ decision [to decide about their kid’s hair and outfit]”

MOHEM CHILD GROW_UP **MOHEM** PARENTS GOOD TEACH

“When child is growing up parents **should** teach him”



Figure 6. *MOHEM*

The sign *MOHEM* here indicates what the signer believes the parents should do. The point about *MOHEM* is that this sign originally means ‘important’ and is still used in this sense. It seems that the sign *MOHEM* has undergone a semantic change toward being a modal marker. Mouthing the Farsi word *lazem* ‘necessary’ while signing *MOHEM* is not uncommon and supports this observation. This is the case in (13). In this sentence, extracted from a bigger discussion, the interviewee and the interviewer were discussing how young couples can improve their financial situation so that they can buy a house as soon as possible.

(13)

SIMILAR STINGY **MOHEM** (mouthing the word *lazem* ‘necessary’)

‘They **should** be just like stingy people [and don’t spend their money generously]’

According to the consultant’s opinion, which is compatible with the data, it seems that *MOHEM* is more used in discourse contexts in which the speaker is describing a better

situation and the way things should be in that situation for everyone. In other words, the speaker does not address a specific person or persons, rather gives advice generally and impersonally. Whereas imperatives and BAYAD are used more in context to address a specific person.

4.1.2 Participant-internal necessity: BAYAD, MIKHAM

This category refers to the semantic domain where the source of the condition placed on the agent is internal to the agent. That is, the agent is the source of her own restriction or condition.

Weak necessity

Example (14) taken from a larger conversation about financial management in one's life is an instance of participant-internal necessity which is expressed by BAYAD. The signer is discussing his general attitude toward financial issues. He is asked what he would do in case something urgent happens and he needs money. He explains that he is the kind of person who should always have a plan for his finances in advance.

(14)

BAYAD IN-ADVANCE PLAN Aff. I

“I **should** plan in advance”

The source of necessity in (14) is internal. The signer expresses an inner obligation to always have plans for his financial affairs.

Strong necessity

An example of participant-internal strong necessity is given in (15), which is taken from a love story told by a signer in a public video.

(15)

ONE_DAY SEPARATE TOLERATE NO **BAYAD** TOGETHER

“They couldn’t bear even one day far from each other. They **had to** be together.”

In this example the source of strong obligation is internal to the participants. The articulation of BAYAD is tense and along with a clear head tilting and brow furrow.

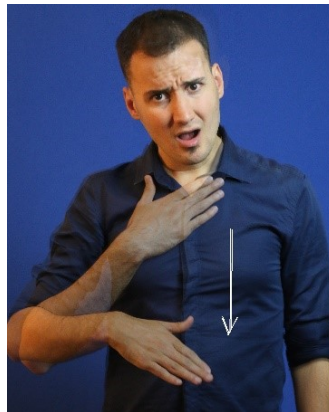


Figure 7. MIKHAM

Other ZEI sign for expressing internal strong necessity is MIKHAM ‘want’ (figure 7). In an example taken from a narration in a public video MIKHAM is used as a marker of intention and inner obligation. This is shown in (16) where the signer tells a story of a priest walking in a snowy and stormy night. The man feels continuing his way is becoming

more difficult and even impossible. He is talking to himself desperately and thinking what to do.

(16)

MAN PRIEST COLD COLD WALK **WANT** GO COLD

‘The priest was walking in cold weather saying: It’s too cold, but I **have to** keep going’

Non-manual markers are important in distinguishing between modal meaning and volition meaning of MIKHAM. In this example, the signer uses the manual marker MIKHAM along with special facial signals including knit brow and narrowed eyes. The face shows a strong necessity for continuing the way even though the heavy storm is a big obstacle. Thus, the combination of non-manual markers and a volition/intention manual marker form a participant-internal strong necessity modal. Another important element is the manner of movement for the verb GO in this example. It has a sharp and beat like movement that, along with facial markers, indicates a sense of emergency and desperate.

In their cross-linguistic study, Bybee et. al. (1994) show that in many languages a similar form is used for future tense, for expressing intention, and as a marker of obligation. According to them, polysemy or multifunctionality of some irrealis markers relates to the mental reality that in many situations, an intention is expressed by means of expressing a desire or an obligation which entails a prediction about an action occurrence in the future. Thus, a similar form might be used as future marker, desire and obligation marker. A similar example is an old ASL sign, with the meaning “necessary” that had the similar form of the contemporary ASL WANT (Higgins 1923).

4.1.3 Epistemic Necessity

The only manual sign found in this study to express epistemic necessity is HATMAN (figure 8) that is a certainty marker, as in (17).

(17)

HATMAN NIGHT RETURN

He **certainly** will come back at night.

This example is taken from a narration in a public video in which the signer is telling the story of a couple. In a scene when, after a tense quarrel between the couple, the man leaves the house, the woman says the sentences (17) to herself.



Figure 8.HATMAN

A head tilt, to right or left, and frowning also accompany HATMAN in this example. Generally, it is very common in ZEI that epistemic modality is expressed only by

non-manual markers. Head tilt and brow furrow are among non-manual epistemic necessity markers. More discussion about the role of facial markers in expressing epistemic modality is presented in chapter 5.

A summary of manual markers of expressing necessity in ZEI is shown in table 3. It shows that only BAYAD among manual necessity markers is polysemous. The findings also show that none of the non-epistemic manual modal markers is used in the epistemic meaning.

ZEI Manual modal markers					
	BAYAD	MAJBUR	MIKHAM	MOHEM	HATMAN
Participant- external weak	✓ Advisability specific agent			✓ Advisability unspecified agent	
Participant- external strong	✓	✓ root necessity			
Deontic	✓				
Participant- internal weak	✓				
Participant- internal strong	✓		✓		
Epistemic					✓

Table 3. ZEI manual necessity markers

4.2 ZEI Possibility Markers

ZEI forms used for expressions of possibility are described in what follows. Similar to the necessity domain, possibility is divided into two categories of participant-internal and participant-external, based on the source of possibility. Epistemic possibility is the third category related to the approximations, probabilities, and likelihood of state of affairs expressed by the speaker.

4.2.1 Participant-internal possibility: *MITUNE*, *BALAD*

Participant-internal possibility is used to describe the enabling conditions inherent in the participant, mainly pertaining to those markers referring to mental and/or physical abilities. The common participant-internal possibility marker in this sense is *MITUNE* (figure 9), which refers to mental and physical ability. This sign can be one or two-handed based on the degree of possibility or the degree of the speaker's confidence in expressing that.

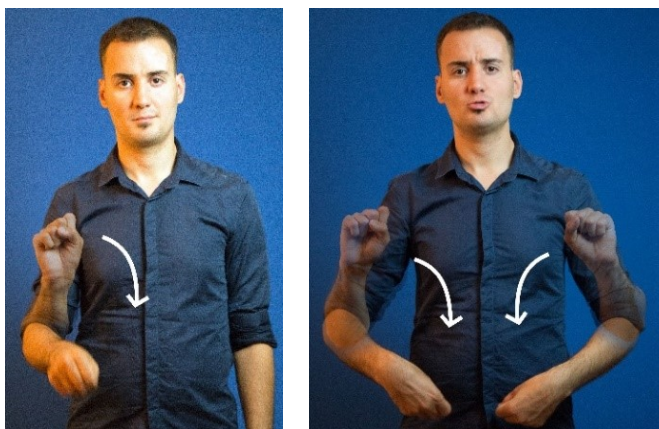


Figure 9. MITUNE can be one-handed or two-handed

Physical and mental ability/skills

MITUNE is a sign for expressing both physical and mental abilities. An example of MITUNE in the sense of physical strength is shown in (18).

(18)

YOU WATER DRINK-NOT YOU **MITUNE** WALK

‘**Can** you walk if you don’t drink water?’

In example 18, taken from conversational data, the signer makes an analogy between a car without fuel and a person who does not drink water, and concludes that just as a person cannot walk without drinking water, a car cannot move without gas. This sign is also used for expressing people’s skills, as in example (19).

(19)

MITUNE COMMUNICATE **MITUNE**

I can communicate [with them].

This sentence is taken from a long discussion in which the signer first tells a story of her encounter with a deaf person from a remote area where a different sign language is used. Finishing the story, she tends to emphasize that she is capable of communicating with signers of different sign languages.

In example (19) MITUNE is used in the domain of general ability or skills. For some other skills, the sign BALAD is used which includes the sign KNOW followed by an

affirmative marker (MISHE) (figure 10), usually accompanied with a downward head tilt (20).



Figure 10. *BALAD* (*KNOW* +*aff*⁷.)

(20)

DRIVE **BALAD** YOU

‘Do you **know how to** drive?’

4.2.2 Participant-external possibility: *MISHE, RAHAT*

Root possibility

As it has been described in Van der Auwera and Plungian (1998) and Bybee and Fleischman (1995), root possibility refers to general enabling conditions and conditions such as social and physical. Thus, the source is not an individual or an institutional authority but rather the general circumstances that allow the completion of an action. The

⁷ Affirmative marker has so many different functions in ZEI including possibility modal (MISHE), existential and possessive marker.

ZEI manual sign MISHE, which is basically the affirmative marker⁸, (figure 11), is used for expressing this kind of possibility.

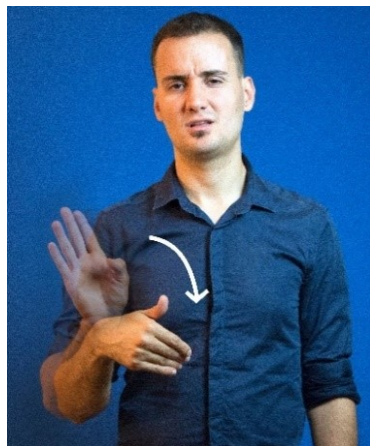


Figure 11. MISHE

Canonically, MISHE is produced in neutral space. When used alone, MISHE expresses root possibility and sometimes permission, (but again with no specific source of authority). MISHE is not used for physical ability, but, as it was explained before, its combination with KNOW is used for mental abilities and skills such as cooking, driving, and speaking a language. MISHE can be produced with a single downward stroke, or two shorter downward strokes. An example of using MISHE in the meaning of root possibility is shown in 21.

In example 21, the signer is answering a question that asked if the room of the interview has enough space for hundred people. He initially gave a negative answer and assessment. He then reassessed and signed (21) by which he expressed a limited

⁸ More specifically, MISHE is affirmative marker of existence and possession.

commitment to the likelihood that it might be possible to have hundred people in the room.

(21)

STAND PROBABLY **MISHE** (two-stroke) BUT COMFORTABLE NO

“Probably in a standing position. It **is possible**, but it won’t be comfortable”

MITUNE is also used in contexts referring to external enabling circumstances, as in (22)

(22)

IF DISTANCE GO SHORT **MITUNE** WALK GO

‘If I am to go to a place nearby, I **can** walk there.’

Example 22 is from conversational data in which the signer discussed different options she might choose in case her car runs out of fuel and stops along the way. Here, MITUNE can be read as root possibility, or participant external possibility which is the result of the condition (short distance). However, one can look at this example as an in-between phase of grammaticization as well, because the enabling source is both the external situation which is the short distance, and the participant herself for the act of walking. In this regard, example 22 is different from MITUNE in contexts where the enabling condition is completely external to the participant. For example, 23 is a case of MITUNE as a complete participant external modal.

(23)

HERE THERE SUBWAY QUICK WAY HALF_AN_HOUR **MITUNE** QUICK
GO

‘If you get the metro fast line from here, it **is possible** to get there (you **can** get there) quickly in half an hour.’

Here, the possibility of traveling and reaching the destination in half an hour comes from the metro fast line, and not the participant’s ability.

Another use of MITUNE is observed as an availability marker as a strategy of politeness for expressing an indirect request (24).

(24)

IF EDUCATION HIGH DEGREE **MITUNE** LITERACY TEACH HE

‘If there is someone with higher education, I’ll ask that person: **can** you teach him how to read and write?’

This sentence is taken from a conversation about how people can help illiterate deaf persons by teaching them how to read and write. The interviewee first argued that he is not an expert in teaching, but if he meets an illiterate deaf person, he would ask highly educated people to help the illiterate person. Although the modal MITUNE can be read as an ability or skill marker, the facial expression, which is a familiar request-gesture shared by deaf and hearing Iranians (head movement to one side and squinted eyes), leads us to interpret it as a wish/desire marker, too, and, as Narrog (2016) mentions, this involves performing a discourse function by forming a request (2016: 112).

Another marker of participant-external possibility is RAHAT (figure 12). Although no example of RAHAT is found in the conversation data of this study, it is worth mentioning the use of this originally adjectival sign in a modal sense. RAHAT ‘comfortable’ is originally used as an adjective, in the meaning of for example a comfortable sofa, or ‘with no problem or distraction’ in the meaning of enjoying your free time pleasantly. However, this is a marker of possibility as well when deaf people talk about resources and opportunities that make some event or action possible. For example, completing some paperwork or legal issues in the presence of an interpreter is RAHAT ‘possible’ for the deaf but without that it is impossible.

The modal meaning of RAHAT ‘possible’ and its adjectival meaning ‘comfortable’ both are frequent in modern ZEI. It seems that RAHAT is undergoing grammaticization towards becoming a modal marker and covering more semantic domains.



Figure 12. RAHAT ‘comfortable’/‘possible’

Deontic possibility

It is very common in ZEI to express permission solely by non-manual markers. A clear head tilting to the right or left along with the manual sign of a verb is a very common structure. Blinking usually accompanies head tilting. Pursued lip and brow furrow are secondary markers in this regard.

MITUNE as a permission marker is not common. However, example 25 was observed in conversation data in which the signer was talking about the policies of paid leave for employees in the organization in which he works. It seems that using MITUNE in a sense of permission from an authority is new and limited to bureaucratic regulations.

(25)

THEY SAY YES **MITUNE** IF TIME WORK_OFF O-W-E HAVE **MITUNE** USE.

‘They said: “yes, you **can**. If we owe you your regular paid leave, you **can** use them”.’

In contexts other than laws and regulations, such as teachers’ or parents’ authoritative utterances, the common way of expressing permission is facial markers along with the articulation of the verb sign. MISHE, is also a common way of expressing permission, as in (26).

(26)

TODAY GO SCHOOL HEALTH GOOD NO I BOSS CALL I HEALTH GOOD
NO **MISHE** EARLY GO BOSS SAY **MISHE** GO

‘Today I didn’t feel well at school, I asked the principal if I **can** leave earlier. He said Ok, you **can** leave.’

Non-manual markers including clear head tilting to the left and a semi-blinking to show the expression of permission by the principal accompanies second MISHE in example 26.

Another use of MISHE is observed in video data by which a moral acceptability is expressed. Example 27 is taken from a narration told by the signer on the importance of showing respect to parents.

(27)

MAN HE ANSWER WELL COME-NO NO_BIG_DEAL COME-NO

FATHER SEE UPSET HEART BREAK SEE FEEL SON DIFFICULTY
GROW EASY SAY COME-NO **MISHE**

“The man answered his father: ok, you don’t come [to my wedding]. It is not important for me. Don’t come”. When father saw this reaction, he became sad and felt heart broken. He said to himself: “You go through all difficulties to raise your son, and he, easily, tells you ‘don’t come [to my wedding]’ is it **possible (acceptable)?**”

This use of a possibility modal is deontic in Van der Auwera and Plungian’s (1998) terminology, since some social or ethical norm is the source of permitting the participant to engage in the state of affairs. According to Nuyts (2016:36) also, deontic modality encompasses modals by which the speaker indicates the degree of moral acceptability or desirability of the state of affairs expressed in the utterance.

4.2.1 Epistemic possibility

Although there are some manual signs for expressing epistemic possibility in ZEI, most of the time different degrees of commitment to the truth or different degrees of probabilities are expressed by facial markers. The main markers are expressed through the eyes and lips. Squinted eyes and wide open eyes both are epistemic markers indicating different degrees of certainty and probability. Even when manual markers are produced, they are always accompanied with eye signals, head tilt and lip movements (pouting or downward movement of lips corners).

SHAYAD and MOMKEN (figure 13) are common manual possibility modals in ZEI. They have the same handshape and orientation. However, MOMKEN is articulated with longer wrist movement whereas SHAYAD has smaller or shorter movement. If mouthing accompanies the signs, it is the visual patterns of Farsi words ‘momken’ for MOMKEN and ‘shayad’ for SHAYAD⁹. An example of MOMKEN is shown in (28).

(28)

WIFE I DISCUSS SAY I NOW NEED WAY WHAT, SHE **MOMKEN** SAY I JEWELRY SELL.

“I would talk to my wife and say I need money now, what should I do? She **might** say she would sell pieces of her jewelry.”

⁹ The two Farsi words are synonyms, meaning ‘maybe’. I could not find any difference in semantic map of the two in Farsi linguistic literature and as a Farsi speaker I use them interchangeably.

In example 28, the signer is explaining which different hypothetical options might be available for him if some financial emergency happens. One of the options he discussed was asking his wife for financial help.

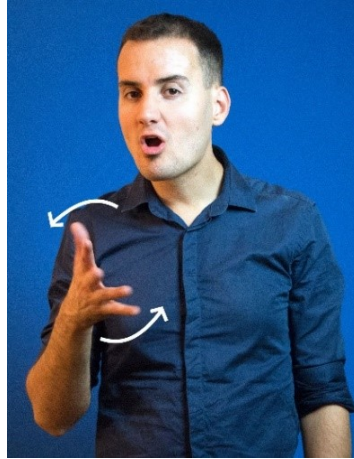


Figure 13. MOMKEN/SHAYAD

In a finer grain discourse approach, we can say that SHAYAD is used in a context in which the discussed state of affairs is something not very usual and with low probability based on the presupposed knowledge (of the addressee or the speaker or both). For example, I go to school every day but, it is probable that I will skip class tomorrow, as in example 29.

(29)

SHAYAD TOMORROW UNIVERSITY NO CATCH_COLD

I **may** not go to school tomorrow, I caught cold.

This is similar to Davis's (1988: 164) discursive analysis of *may* in English. According to Davis, the meaning feature of *may* is 'contradictory of existing common ground expectations'. However, when the speaker wants to emphasize that the state of affair discussed in the discourse is quite probable, she uses MOMKEN. Thus, MOMKEN signifies high probability to the proposition on the part of the signer. In fact, MOMKEN rejects the improbability of the target event and functions against the common ground of the discourse. The facial markers of MOMKEN and SHAYAD are used even without manual markers with the same semantic values: squinted eyes for low probability and wide eyes and head nod for high probability. More analysis of facial markers is presented in chapter 5.

ZEI manual possibility markers are listed in table 3. As it is shown polysemy is not attested in all ZEI possibility signs. Similar to necessity modals, no sign is shared in epistemic and non-epistemic domain.

ZEI Manual modal markers	 MITUNE	 MISHE	 BALAD	 MOMKEN/SHAYA D	 RAHAT
Participant-internal Physical mental ability	√		√		√
Participant-external root possibility	√ (vague as to how much is internal)	√			√
Deontic	√	√			
Epistemic				√	

Table 4. ZEI manual possibility markers

4.3 Conclusion

Manual modal markers of necessity in ZEI are BAYAD, MAJBUR, MIKHAM, MOHEM and HATMAN. BAYAD is the most common necessity modal marker and is used in a variety of contexts covering many semantic domains including weak and strong

obligation, either biological and physical or obligations forced by an authority, and also advisability. MAJBUR has more limited functions. It is normally used for root necessity which is an obligation forced by the general circumstances toward the agent to complete an action. MAJBUR marks a more desperate sense of the agent under a strong external obligation.

MIKHAM is originally a desiderative verb shows the desire or willingness of the agent. The modal function of this sign coexists with its non-modal use of the sign in ZEI. The use of MIKHAM as a modal marker is limited to the situations in which a strong desire based on a strong inner obligation is the source of necessity.

MOHEM is the marker of advisability which is grammaticized from its original adjectival function with the meaning ‘important’. This sign is used when the signer gives advice to an unspecified agent or to the public with the purpose of showing the necessity or importance of some act in the pursue of something. The only epistemic necessity manual marker found in ZEI is HATMAN which is used for expressing certainty.

Regarding ZEI possibility modals, MISHE is the most frequent sign conveying a wide range of possibility concepts. This sign is used for expressing root possibility, acceptability and permission. The other sign is MITUNE which is basically used for expressing physical-mental ability. BALAD is another ability marker, with more limited domain conveying only human skills. RAHAT is a marker of participant-external possibility developed from its original adjectival meaning ‘comfortable’. This sign indicates a possibility sense of undertaking an action with a diffuse or mixed source of the

potency: it is possible because the agent has capability of doing the action or because the facilities exist or both.

For the expression of epistemic possibility, ZEI signers use either MISHE for higher certainty and MOMKEN/ SHAYAD for a lower degree of certainty, both with conventionalized facial gestures, specifically the horseshoe shape of mouth. This facial marker along with other facial expressions are discussed in more detail in the following chapter.

Chapter 5

5 Facial modal markers and Cognitive Grammar

Alan Fridlund, a social and clinical psychologist, who has been working on human facial expression and social interaction, pointed to the autonomous function of facial expressions in his book:

“like the verbal interjections we insert in our ongoing speech, there may be nonverbal interjections, once derived from vocalization but now emancipated from it, making them appear autonomous and wholly apart from the stream of our facial paralanguage. If so, then like our verbal interjections, those faces that have preoccupied generations of researchers, ..., may be seen simply as “parts of speech” in a future facial grammar.”
(Fridlund, 1994: 312-13)

What I will discuss in this chapter is in line with Fridlund’s account on facial markers. After a review of other scholars on facial markers, both in linguistics and gesture studies areas, I will explain the grammatical roles of facial movements in ZEI modal expressions.

Only two manual signs have been found in all analyzed data for the present study that is used as epistemic modality markers: SHAYAD/MOMKEN for epistemic possibility and HATMAN for epistemic necessity. In the limited number of studies on signed languages modal expressions, the role of the face, has been mentioned, albeit not in any detail, especially in the epistemic domain (See 5.2). It seems that a persistent issue in the analysis of modality is the expression of epistemic modality, which does not have very

many manual manifestations. In other studies (Ricci Bitti et al. 2014), the role of facial markers has been shown to be important in expressing uncertainty, doubt or assurance.

In this section, I first discuss the findings of non-linguistic research in gesture and neurobiology studies and show that there have been studies in which facial muscle movements have proved to be markers of specific human cognitive states. Then, by reviewing the cognitive framework, especially the concepts of control cycle, reality, and effective versus epistemic control, I will try to identify the relation between grammar, the concept of control, modality, and facial markers in this approach. Also, I will discuss the concept of immanence in CG, which has a specific significance in the distinction between epistemic and non-epistemic modality.

Finally, I will discuss ZEI facial markers and their semantic values. I will discuss the semantic domains of brow frown (BF), horseshoe mouth (HS-m) and squinted eyes, as three grammatical markers of epistemic modality.

5.1 Gesture account of facial markers: lips and eyebrows

The role of facial markers in human social interaction have received more attention from gesture scholars than linguists. Although many gesture studies have discussed co-speech gestures, some others have also observed facial gestures in conversation without co-occurring speech, suggesting that they can also communicate independently (Chovil, 1991: 166).

Chovil (1991) distinguished syntactic and semantic features of facial markers, or displays in her terminology, and stated that some facial displays systematically occur with particular syntactic features and thus appeared to serve as markers of these syntactic

features. Others convey semantic rather than syntactic information, that is, they convey something about the speaker's opinion or reaction which formed part of the idea being expressed.

Ekman (1985) and Chovil (1989, 1991/1992) observed *facial shrugs*, which typically involve a quick eyebrow flash and the retraction of a corner of the mouth. Ekman (1985) identified this as a type of emblem which conveys the message “I don't know” and discussed facial shrugs in contexts he called “redundant” versus the “non-redundant”:

Facial shrug redundant: often consisted of eyebrow flashes (a sudden raising of the brows and a return to normal) or a retraction of one mouth corner. (1985:183)

Facial shrugs non-redundant: the corners of mouth pulled down into a horseshoe shape as well as brow flashes and retraction of mouth corners. (1985:186)

Chovil (1989) discussed facial shrugs as a type of “paralanguage” displays in four categories. Other categories of facial paralanguage she classified are: personal reactions, thinking/remembering displays, and interactive displays (from Fridlund, 1994: 301). Facial shrugs occur, for instance, in the underlined word in following sentence “It’s possible that what you say is true”. As Chovil’s example shows, the concept conveyed by this category is a modal. In general, Chovil’s categorization of semantic of facial displays is more or less in alignment with the modality domain, or in general, with expressing stance:

“illustrated opinions about the topic or a specific idea being discussed (e.g., “That was stupid.”); or indicated problems with the task itself (e.g., difficulty in coming up with a particular food or story).”(p. 19)

The term ‘shrug’ has been used in other gesture studies to describe facial displays with a variety of form and meaning. For example, Debras (2017) showed that the *mouth shrug*, which is the horseshoe shape of mouth, is a marker of the speaker’s epistemic indetermination (inability to decide/ not knowing) (2017:18). She listed epistemic-evidential modality as one of the semantic areas which is marked by the mouth shrug (2017: 23).

Ricci Bitti et al. (2014) introduced two facial gestures as markers of doubt and uncertainty. They labeled them *Lip Corner Depressor* and *Chin Raiser*, which indicate different degrees of uncertainty. They showed that lip corner depressor can be read as “*I don’t know*”, when it is combined with eyebrows up is equal to “*I am not sure if I know it*”, and when it is combined with tightening of the eyelids means “*I do not know, but I can try to retrieve this information*”.

Some scholars have studied facial muscles activities in infants and young children. “Brow lower”, “chin raise” and “lip stretch” have been listed in children facial’s expressions during problem solving tasks (Littlewort, et al., 2011). Knit-brow, a forehead muscles contraction, has been studied in infants. This facial activity indicates a form of highly focused, effortful attention associated with active information processing (Sullivan and Lewis, 2003).

Some other studies (Huang et al. 2017, Ding-Hau et al. 2014, de Morree and Marcora 2010, Rejeski and Lowe, 1980) consider “frowning” or “grimace” as facial markers of physical effort with no more details about the exact face muscles involved.

5.2 Studies on facial markers' modality value in signed languages

Cuxac (2000: 56) listed different concepts in French Sign Language (LSF) that are expressed on the face. Among more than 40 different semantic domains in this list, some domains cover modal meanings. Senses of ease and fluency, hesitation, indecision, suspicion, and assurance are among the concepts that are facially marked in LSF. Facial markers also play role in expressing different modes and senses, such as conditional, hypothetical, assertive, and volitive in LSF (Cuxac 2000: 226-232).

Wilcox and Shaffer (2006) showed that brow furrow and head nod, along with alteration of sign manner of movement, are markers of strong commitment in expressing epistemic modality in ASL. They presented ASL examples in which they described head nod and brow furrow representing mental effort required to evaluate a proposition and commit to its truth (2006: 228-230).

Shaffer & Janzen (2016) claimed that facial gestures which indicate certainty accompany the sign FUTURE and are markers of epistemics as opposed to temporal meaning in different discourse contexts (2016: 463).

Gianfreda et. al (2014) studied expression of uncertainty in Italian Sign Language (LIS) and found that facial expressions including lips bent down or slightly stretched to the sides are markers of intensifying the level of uncertainty accompanying manual signs (Figure 14). The use of bulging eyes, raised eyebrows and lips bent downwards are shown to be important in conveying higher uncertainty in LIS (2014:222). They also showed that brow furrow with a head nod gives some assertive value in expression of possibility (2014: 215).



Figure 14. A marker of uncertainty in Italian Sign Language (Gianfreda, et al. 2014: 211)

The role of lips and frowning in expression of modality is also discussed in a dissertation on facial expressions in Spanish Sign Language (LSE) modality (Iglesias-Lago 2006). Lowered corners of the lips is one of the markers of epistemic modality in this language. Downward movement of the corners of the lips is mentioned as one of the facial markers that is used for the expression of the epistemic possibility in LSE. This facial display can also function as the only marker of epistemic modality in the utterance with no accompanying manual sign (2006: 209). Iglesias-Lago stated that the facial marker in which the chin pushes the lower lip upwards is a gesture of expressing doubt (2006: 225). Brow furrow is listed under the markers of deontic modality, necessity, permission and obligation in LSE (2006: 224-5).

Non-manual markers including lowered corners of the mouth, raised or furrowed brows are mentioned as modality markers in New Zealand Sign Language (NZSL) as well (McKee & Wallingford 2011: 232).

The common observable fact among all these studies is the importance of facial markers, specifically lips, eyes, and eyebrows, in conveying modal concepts in general, and epistemic modality in particular. However, missing from research on facial displays

and modality is an explanation into the different linguistic-conceptual categories of manuals and facial markers and a more detail analysis of face movements. What follows is an initial attempt for applying cognitive grammar tools for a deeper understanding of facial channel in sign languages modality expressions, based on ZEI data.

5.3 A Cognitive account on modality and facial markers

5.3.1 *Conception of reality in CG*

In the theory of CG, reality is ‘the history of what has occurred up through the present moment’ and is ‘what a speaker conceives as being real’ (Langacker 2008: 297). Therefore, reality is the **established** course of events. Future events thus are not part of reality because they have not been established. A particular conceptualizer (C) accepts some situations or states of affairs as being real, and some other situations not. The accumulation of all real/not real situations through time shapes the conception of reality for the conceptualizer. This is termed *conceived reality* (R_c) and represents what C conceives and accepts as being real at any given moment as part of a larger space of actual reality. A clause with no modal marker indicates the process is being conceived as part of reality space (R_c) by the conceptualizer. A clause marked by a modal expression associates the process as outside of R_c and therefore part of *irreality*.

Modal expressions, therefore, increase the epistemic distance of the conceptualizer in the present reality and the position of the process in the reality line. For instance, ‘He may be sick’; and ‘He will be sick’ show more distance to the conceived reality by the conceptualizer. They express *projected* or *potential reality* (figure 15).

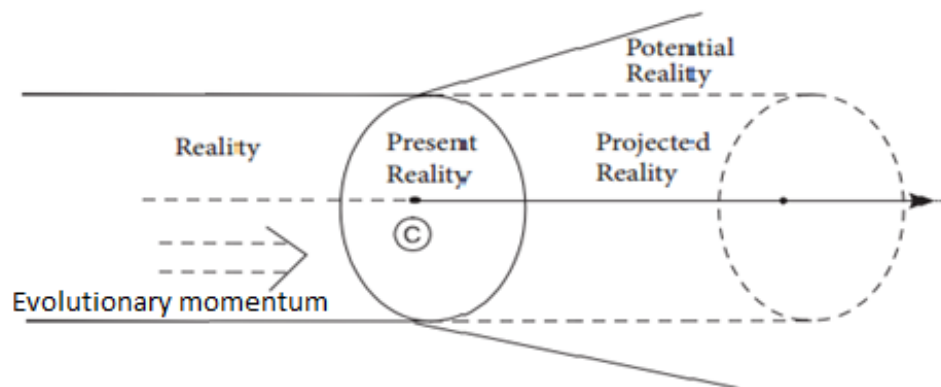


Figure 15. Reality evolutionary momentum (Langacker 2008: 306)

R_c progresses through time and certain pathways are rejected as being part of the reality and placed in irreality. The difference between “will” and “may” in English is that *will* has stronger epistemic power and places the event in projected reality, whereas *may* refers it to the potential reality (Langacker 2008:307). Thus, modals are used to situate a clause in the irrealis part of the reality line based on the conceptualizer’s evolutionary momentum. In this respect, modal markers can be considered clausal grounding elements.

5.3.2 Grounding and modality

The analysis of modality in CG can be understood in terms of the notions of *grounding* and *subjectivity*. *Ground* refers to ‘the speech event, its participants, their interaction and immediate circumstances’ (Langacker 2008:259). There are grounding *elements* in every language by which a phrase or clause gain status or relates to the *ground* (the speech event, its participants, their interaction and the time and place of speaking). This happens through processes of *grounding*.

What English modal auxiliaries do is to make some comment on the likelihood of occurrence of an event, in order to demonstrate the ‘epistemic status ... in relation to what we currently know and what we are trying to ascertain’ (Langacker 2008:297). Modals, along with tense, are considered grounding elements by which a finite clause is recognized by relating it to time, reality, and discourse status. The implementations of grounding vary from language to language. What is universal, however, is that “every language provides conventional means for indicating the epistemic standing of a profiled thing or process vis-à-vis the ground.” (Langacker, 2008: 264)

5.3.3 Control Cycle

Modality is one of many ways in which conceptions of physical or abstract force are reflected in linguistic structure (Langacker 2014:3). The source and mechanism of this force and the conceptualizer’s interaction with it has been discussed under the concept of ‘control cycle’. This conception is inherent in and abstracted from many aspects of our experiences. The control cycle is a fundamental conception and its manifestations can be physical, perceptual, mental, or social. For example, directing of visual attention for capturing a target by bringing the target to the focal area is a perceptual manifestation of control cycle (2014:3). A mental manifestation of the control cycle is when we accept an entity as real, i.e. we incorporate the entity in our reality conception, R_c (2014:6).

Modality and modal concepts can be described based on the mental control over processes and the mental effort to locate a given process in the projected or potential reality. In Langacker’s account, English modal auxiliaries display different degrees of mental force

tending toward realization of the target process, as opposed to designating either the action of its realization or the situation that results. (2014: 5)

5.3.4 *Effective vs. Epistemic control*

If the intent of a linguistic interaction is to produce some effect or influence on the world, the conceptualizer's striving for control is categorized as an effective control. Examples are producing an utterance for attracting the hearer's attention, or for eliciting a response (either a linguistic or non-linguistic action). Linguistic interaction can also be meant to exert control over the knowledge of the world, and not to influence over the world. This kind of control is epistemic, and it only occurs in the mental realm with no physical manifestation. The relation between these two different kinds of control is that the basic or core component of any effective control is an epistemic control. Modals are indicators of both effective and epistemic control in the language.

“The epistemic dominion in epistemic control (modality) is a conception of reality (R_c), as opposed to reality itself. The modal force is internal to the conceptualizer (C), an aspect of C's mental activity”. (Langaker 2013: 27) In effective modals the conceptualizer incorporates *both* in occurrence and assessment of the target event. However, in epistemic modals we are left with *only* the assessment incorporation and the other part fades away. The flip side of this fact is that epistemic control is *immanent* in every modal expression.

The term effective covers all non-epistemic modals traditionally labeled as root, deontic or dynamic modality. The common concept for both effective and epistemic modal expressions is that they hold a ‘potency’ that is engaged with undertaking of an action. The potency becomes central in the grounding process. What distinguishes effective and

epistemic modal expressions is the tendency in effective modality to *effect the grounded process* (2008:306).

"Linguistic interaction is a means of striving for control. It may be aimed at achieving particular results, either directly or indirectly. Minimally, producing an utterance serves the purpose of attracting, directing, and focusing the hearer's attention. It may further be intended to elicit an overt response, either a linguistic response (such as answering a question) or a non-linguistic action (like carrying out an order). Or it may be aimed at achieving some result more indirectly, e.g. by establishing a plan of action to be followed subsequently. The intent in each case is to produce some effect, to have some influence on the world, so these can all be described as the striving for **effective** control." (Langacker, 2013:9)

Effective modals indicate a potency with the objective of causing the process to occur or become part of reality. Epistemic modal expressions, on the other hand, do not aim to effect the grounded process, i.e., to force or facilitate their occurrence, but rather to assess the occurrence and locate the grounded process either in projected or potential reality. Epistemic modal expressions indicate the potency or force which is not based in the grounding itself but rather is attached to the conceptualizer's attitude to or evaluation of the process and the evolution of reality in regard to that.

However, according to Langacker (2013), epistemic and effective (non-epistemic) modals do not belong to completely different realms. By using an effective modal in an utterance, the speaker indicates her intention, obligation, or permission for an event to occur, but this also indicates that the event is conceived as unrealis by the speaker (or conceptualizer) which means the event is not part of her reality. This is the epistemic

component of effective modals which is “immanent” in every effective modal (2013: 16). As he states, “As effective control fades away through attenuation and diffusion in its locus, its epistemic component comes to the fore” (2013: 26). In what follows, some effective and epistemic modals in ZEI are discussed and the function of facial markers are examined.

5.4 ZEI modality and facial markers

5.4.1 Horseshoe mouth

Lowered corners of the mouth, or Horseshoe mouth (HS-mouth), is a common facial marker which appears in many diverse contexts. HS-mouth is very frequent in expressing possibility modals. It appears with or without manual modals. As was discussed before (→ chapter 4) a common ZEI expression of possibility is the manual sign MISHE. When used alone, MISHE expresses root possibility and sometimes permission, but with a diffuse source of authority. This sign can be produced with a single downward stroke, or two downward strokes.



Figure 16. HS-mouth with manual possibility modal marker MISHE

In the excerpt from which figure 16 is taken, the signer has been asked if it is possible for hundred people to occupy the interview room. He answers that “it is possible but not in the sitting position, only in a very tight standing position and even then, with difficulties. **It is possible**, but it is not comfortable.”

MISHE, in this context, is produced in neutral space on the left hand with reduplicated strokes. Because the strokes are reduplicated, they are produced with a fairly “soft” movement. This can be interpreted as that the strength of possibility is only moderate; as indicated, it is *possible* but not *comfortable*.

Along with MISHE ‘possible’ a horseshoe mouth appears on the signer’s face. The modal is an example of root possibility, which is an effective modal in the CG account. The source of potency is diffuse, including the size of the room, whether the people are standing or sitting on chairs, and cultural proxemic norms. Evaluation of the circumstances to find out how it would effect the realization of an event can be seen as mental effort. The conceptualizer “strives” for control over the knowledge of possibility of the event to be true or real. This assessment about the possibility of the proposed situation is marked by horseshoe mouth. Squinted eyes is observable here as well and indicate the degree of certainty, which is not one hundred percent. The signer expresses a limited commitment to the likelihood that it might be possible to have one hundred people in the room. If MISHE is produced without any facial marker, then a high certainty to the realization of the event would be conveyed.

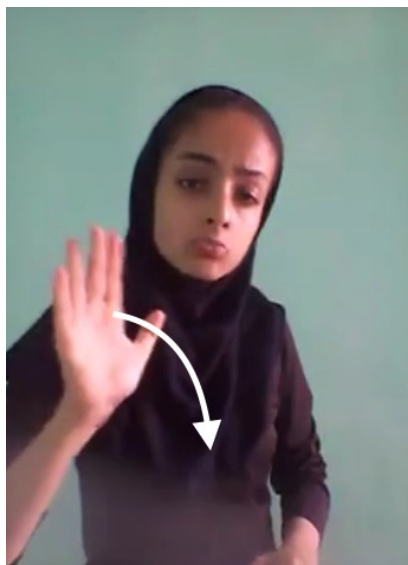


Figure 17. HS-mouth with manual possibility modal MISHE

Another example in which MISHE appears with a horseshoe mouth is shown in figure 17 in which MISHE is used in the sense of social-moral acceptability in the following context:

“The man answered his father: ‘ok, you don’t come [to my wedding]. It is not important for me. Don’t come’. When father saw this reaction, he became sad and felt heart broken. He said to himself: “You go through all difficulties to raise your son, and he so easily tells you ‘don’t come [to my wedding]’ **Is this possible/acceptable?**”

Here too we see that MISHE is used in a deontic possibility or permission sense with a diffuse source of potency: social and cultural convention dictates proper behavior of a son towards his father, and thus raises the question of the possibility of a son so easily telling his father to not attend his own son’s wedding. MISHE is produced with a single, rather strong downward stroke and is accompanied by a somewhat more pronounced facial

expression, certainly the HS-mouth, as well as a forward nod of the head (which is simultaneous with the downward stroke of MISHE). As in the first example, the diffuse nature of the source of effective potency allows the epistemic sense of MISHE to emerge and the accompanying facial expressions to come to the fore. Here too, the HS-mouth is a marker for an evaluative sense toward the target process.

The next example consists of only two signs, a point and the sign LET_IT_BE with a question marker on the eyebrows (figure 18). The pointing sign is a point towards the signer's watch on his left hand. LET_IT_BE is directed towards the same location as the pointing sign, the signer's watch.



Figure 18. HS-mouth with the manual sign LET_IT_BE

The signer here asks the interviewer if it is okay if he signs while his wristwatch is on his wrist or is it better to take it off. The sign LET_IT_BE is a B handshape directed towards an entity (or a space associated with that entity) and is used in suggestive or advisability senses. The HS-mouth that appears along with LET_IT_BE expresses an

epistemic evaluative meaning as the signer wants to know what the assessment of the addressee over the keeping the watch on. Eyebrows are frowned as question marker.

The horseshoe mouth seems to have a schematic meaning that includes evaluative, calculative, or assessment senses, and adds a subjective value to the utterance. When it is articulated along with a modal, HS-mouth carries the epistemic component.



Figure 19. HS-mouth as the only modal marker

HS-mouth can be the only marker of modality, for example in the excerpt figure 19 is taken from. Here, the signer is giving a recommendation or suggestion to people who believe in the standardization of sign language: “it is better to respect all different sign languages”. The sense of advisability is expressed via HS-mouth which is articulated along with the manual sign RESPECT. This is said after the signer has explained how diverse Iran is culturally and linguistically, and he makes the case that unifying sign languages would be a bad idea. The sense of advisability is expressed via horseshoe mouth, which is articulated with the manual sign RESPECT. There is no manual modal marker in this example. The horseshoe mouth is responsible for the modality sense of what the

conceptualizer believes is true and should be done. Here again, the horseshoe mouth articulates the evaluation of the signer about the states of affairs, and how he believes reality should progress over time. The conceptualizer's mental effort is first to review and assess his Rc (diversity of languages and the standardization trend), in order to come to a conclusion for how reality needs to evolve over time: the necessity of respecting all languages.

5.4.2 Squinted eyes and wide eyes

One example of squinted eyes was shown in figure 16 where the signer expresses the possibility of occupying the room by 100 people. Squinted eyes is a common marker in expressing probability, doubt, and uncertainty. This marker, and the other certainty marker, wide eyes with eyebrows raised, occur along a continuum of expressing doubt/certainty based on the context of the discourse — more specifically, based on the signer's or the addressee's background knowledge. Wide eyes indicates some event is quite probable even though it is against the addressee's expectation or general background assumption. Squinted eyes, on the other hand, marks the fact that some event is probable, and in fact its realization follows the background presupposition or the general knowledge of the interlocutors. For instance, the sign SCAM can be understood as “it might be a scam (as you know)” or “it might be a scam (as you might not expect)” respectively if it is articulated along with squinted eyes or widened eyes. Thus, wide eyes and squinted eyes sometimes function as markers of intersubjectivity in a conversation. The concept of Rc, which is the history of reality until the present time in the interlocutors' mental realm, is reflected on the eyes when probability is expressed.

According to Halliday (2004), what the modality system does ‘is to construe the region of uncertainty that lies between ‘yes’ and ‘no’ (2004:147). It seems that facial markers, especially eyes in ZEI, mark the different degrees between ‘yes’ and ‘no’. Squinted eyes mark the degree of certainty following the expectation (of the signer, addressee or both). In an example (figure 20) the signer is describing the probability of existence of living beings on other planets: “it is possible that some kind of human or other creatures are living on other planets”. Squinted eyes accompany the sign MOMKEN ‘probable’ and also appear with PERSON and the verb LIVE. HS-mouth is present here as another marker of epistemic evaluation to indicate the likelihood of life existence in other planets which is probable, based on the signer’s knowledge or assessment.



Figure 20. Squinted eyes, marker of probability

Raised eyebrows and wide eyes is observed in another example in which the sign MOMKEN ‘maybe’ is produced. The signer explains that some behavior is not normal and that “it might be a scam”. According to the consultant, it would result in a discursive

difference if the raised eyebrows and wide eyes are replaced with squinted eyes. The utterance presented in this example has a warning sense: “Don’t think it is not possible for that to be a scam”, whereas it would indicate solely the probability of a scam incidence if it was produced with squinted eyes.

As Poggi and Pelachaud (2000) suggested, raised eyebrows is a marker of violation of expectations. A cognitive analysis of widened eyes and squinted eyes in expressing probability is possible through the concept of control cycle. A perceptual manifestation of the control cycle is the directing of visual attention: a target is “captured” by being brought within the focal area, where it is apprehended with full acuity. We think of vision in terms of a perceptual path – a line of sight or gaze – by means of which the conceptualizer “reaches” the target (Langacker 2014:3-7). This can be used as a *simulation* for eyes wide open, when in a more subjective stance, the signer indicates certainty: her evolutionary momentum of reality allows her to see some event in the reality line as to happen for sure. When using squinted eyes, the signer indicates difficulty of seeing something as being completely real. This analysis is compatible with the use of widened and squinted eyes with adjective expressions BIG and SMALL in ZEI. Squinted eyes are used to describe a small entity whereas widened eyes are part of adjectival structures describing a big entity.

5.4.3 *Brow furrow*

This facial marker that results in a distinct vertical line between the eyebrows is very common in both epistemic and effective modals, showing degrees of ‘exertion’. Figure 21 is taken from a video in which the signer is describing the policies of World

Federation of the Deaf on different deaf communities and their languages: “WFD says we **must** respect all sign languages”. Brow furrow along with the manual sign RESPECT is shown in figure 21.



Figure 21. Brow furrow in effective modality

This is an example of an effective modal. It indicates the source of the potency having an effect on the world (reality), i.e. to oblige everyone to respect deaf communities and their languages. However, it is not a strong obligation with an imposing source of potency. The source of potency is common sense and the general good, as there is a social necessity to respect languages and cultures. The signer reports what WFD believes should be done as a quite strong advice, but with no punishment consequence.

The brow furrow, in this example, accompanies an effective modal BAYAD ‘must’ and continues after that over the verb RESPECT. The first analysis for interpreting brow furrow in this context is that it, along with the manual modal BAYAD, redundantly or emphatically marks an effective modality. However, the manual sign BAYAD can also be

produced with no brow furrow as a marker of weak obligation or only an advisability sense, or with different degrees of brow furrow showing different degrees of necessity or obligation, as in this example. Thus, brow furrow is a degree indicator and expresses a mental evaluation over the degree of necessity of an event to be realized.

The fact that brow furrow has formal degrees, from zero form in the advisability sense to a very clear and complete brow line to mark a strong obligation, leads us to look at this facial marker as a gradable symbolic unit. As Langacker (2013:10) states, effective and epistemic control are closely related. To be able to exert effective control, the conceptualizer relies on her body of knowledge or conception of reality. All effective controls have an immanent core epistemic component. The conceptualizer evaluates the target process, notices it is not part of her reality conception, but it needs to be. Moreover, the degree of this necessity is also evaluated. In this way, brow furrow can be analyzed as a marker of mental effort for evaluating the degree of necessity of the target process, here to respect different languages. The more necessary an event is assessed in the epistemic realm, the stronger the form of brow furrow accompanies the effective modal marker BAYAD.

Thus, brow furrow can mark the strength of necessity when it accompanies an effective modal such as BAYAD. This marker also marks the strength of epistemic assessment in expressing certainty. In other word, the face can mark the strength of necessity, or the strength of epistemic assessment: if it is necessary, then reality will likely proceed along this path. Brow furrow is associated with this kind of epistemic assessment. In fact, ‘attitude’ and ‘factuality’ are interwoven in many modality cases, and it seems

facial markers draw them together. This is more observable in example shown in Figure 22, in which brow furrow is articulated without any manual modal sign.

Here, the signer is describing a hypothetical situation. He was asked if he would buy his young child a cellphone if he had a child. He argues that he does not see any problem for his (imaginary) child to use a cellphone to play with when the child is at home, and thus, he would definitely allow the child to do that, but not for the time he goes to school. Brow furrow occurs during the GIVE clause in the part he is talking about giving the child a phone at home. Brow furrow disappears when he shifts to the school setting.



Figure 22. BF as the only modality marker

Since the signer is talking about certainty of ‘giving’ his child a cellphone, and ‘give’ refers to some act with effective features towards the real world, this example might be seen a case of effective modality at first. However, we know that the signer does not have a child, and all he is describing, including GIVE, refers to a hypothetical world. Thus, the brow furrow can be analyzed as an epistemic marker with a sense of certainty: “I would

definitely give my kid a cellphone to play with”.¹⁰ The epistemic component seems to be coded by brow furrow.

5.5 Discussion

As has been mentioned, in ZEI and in other studied sign languages facial markers are more important in the expression of epistemic modality. Also, the number of manual signs specifically used for epistemic modality is limited. This leads us to think more about having manual and facial channels in the domain of modality, and also in the broader concept of linguistic communication. Langacker’s framework posits two major types of control: effective control and epistemic control.

Linguistic interaction is also a means of striving for epistemic control, i.e. knowledge of the world, as opposed to influence over it. ... For one thing, epistemic control serves the more basic purpose of effective control. (2013: 10)

Looking at modals as one of the linguistic manifestations of the control cycle is a useful tool to analyze different characteristics of modals and specific characteristic of epistemic modality. The difference between epistemic and effective is demonstrated in the diagrams of figure 23. (P) is the process or event which is conceived as being outside conceived reality which trigger the emergence of the force on the conceptualizer’s side (mental or socio-physical). The position of the arrows is meant to indicate the location of

¹⁰ BF with the sign GIVE can also be a case of imperative. In that case BF would be an example of effective control, but in this example GIVE is not upon the addressee but the signer.

the modal force. For effective modals, we have two forces, one in the reality conception domain and one force inherent in the mental realm of the conceptualizer (C), i.e. in C's epistemic assessment.

As a feature of C's mental processing, this core force has no potential to affect the outside world directly, whereas the external force represented by the large arrow does have such potential. The force itself is accepted by C as being real –it belongs to the portion of reality (R) that C knows about (RC). The difference between effective and epistemic modal is the lack of effective force in the latter. Removing the larger arrow from diagram (a) leaves us with epistemic modality represented by diagram (b) in which the essential force is only C's mental striving for epistemic control, in assessing whether p should be incorporated in RC.

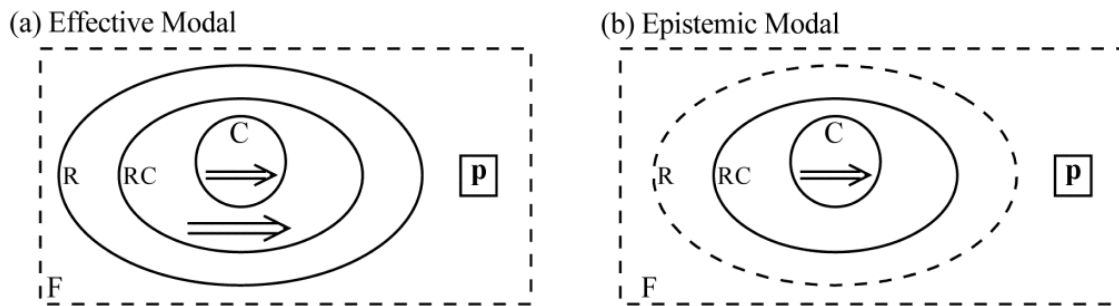


Figure 23. *Epistemic modal is immanent in effective modal (Langacker, 2013: 17)*

The target process does not necessarily lie outside of reality in epistemic modality. It might or might not be part of reality. That is the reason for the dashed line around R in diagram (b). The dominion of modal force in epistemic modality is not reality, but the C's

conception of reality. Because, as opposed to effective modality, here the modal force is not aimed at influencing the actual course of event, but it indicates the C's internal striving for knowledge.

The fact that effective modals have an immanent epistemic component can help us in analyzing different modal forms with epistemic and non-epistemic meanings. All utterances with an effective modality sense, e.g. social obligation, advisability, physical ability, and so on, have a common component which is assessing the target process as an unrealized occurrence, and this component constitutes the epistemic control which lies within every effective control. The commonality between effective and epistemic modals is the speaker's assessment of the epistemic status of the target process (p).

Findings of this study show that effective modals in ZEI are expressed mainly by the hands, by manual signs. Epistemic force, on the other hand, is expressed more on the face. That can be a reason for the limited number of manual signs in expressing epistemic modality and of more active role of the face in expressing epistemic modals. Looking at face and hands as two channels in linguistic communication shows that for the expression of an epistemic force, face cannot be inactive while the hands can be.

The face seems to be the main channel for expressing epistemic force. However, facial markers are also important in conveying the degree of effective force. Based on a cognitive grammar account, an immanent epistemic force always exists in all effective forces. It seems that, at the phonological pole, in effective modality the immanent component of epistemic assessment is expressed on the face. When effective control

attenuates, it's not surprising that the manual component may disappear in epistemic modals, leaving only the facial manifestation of epistemic assessment.

Facial markers are also important in conveying the *degree* of effective force. In fact, one might find it difficult to determine whether in effective modals the face is only expressing the core epistemic assessment and not also the degree of the effective force. To express the degree of an effective force, again, a conceptualizer first needs to assess the degree of necessity or possibility of (p) to be part of her Rc. Epistemic modals posit the force (over an event) in the evolutionary momentum of reality, based on the assessment of the speaker. "The modal force relevant to these [epistemic] uses is one where the speaker indicates the relative ease or difficulty with which she can mentally extrapolate the envisioned event, given what she knows about ongoing reality" (Langacker 1999: 308). It seems that some facial markers express the epistemic force but also grade the effective force, based on an evaluation which is again an act of epistemic control. The more an event is considered necessary or possible the stronger the facial markers are articulated. A stronger brow furrow is used to mark stronger obligation, or stronger certainty. The gradable characteristic of facial muscle movement allows this iconic feature to serve the modality system of signed languages.

The face has always been studied as an important component in expressing adjectives or adverbials in sign linguistics. This is because facial markers are markers of subjectivity and have assessment or evaluative values in communication. The face also expresses the subjective 'exertion' of performing mental operations such as calculating, making a judgment or evaluation, comparing, etc. Exertion can be effective exertion, prototypically level of physical force, but it can also be mental exertion, such as an

epistemic assessment. As support for this proposal, one can refer to studies in which a particular facial expression has identified that coincides with level of exertion, as depicted in figure 24 (Huang, Chiou, Chen, & Chen, 2017, p. 408).

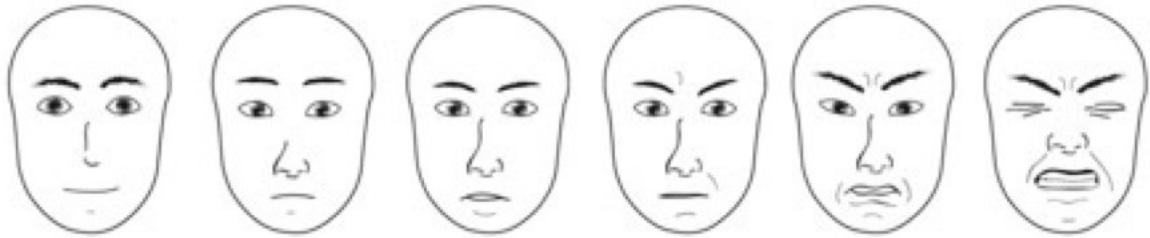


Figure 24. level of exertion (Huang, Chiou, Chen, & Chen, 2017, p. 408)

Frowning has been identified as a kind of “face of effort” by which the physical exercise intensity can be predict and monitored (Rejeski and Lowe: 1980, Huang, Chiou, Chen, & Chen, 2017).

The common facial expressions that accompany effective and epistemic modals in ZEI are the “horseshoe” shape of the mouth, squinted eyes, and the brow furrow. Although these facial expressions are not used only in epistemic modality, as they accompany an effective modal as well, the degree of these markers varies based on the source and the degree of the modal force. The degree of a modal force, in return, is assessed by the conceptualizer (which can be the source of the potency, or not). Thus, whether the face simply marks the strength of possibility, or the strength of epistemic assessment (if it is possible, then reality will likely proceed along this path), facial markers are more associated with epistemic assessment.

5.6 Conclusion

Most of the scholars who have concerned themselves with epistemic modality in sign languages have asserted that there is a very important role of the face in this regard. Findings in this study also show that ZEI epistemic modality is mainly expressed on the face. The face is also active in effective modality.

Applying a CG approach in semantic analysis of modality can help us explain different formal channels in this regard: effective modality inherently has an epistemic control element embedded within it. Thus, we deal with two senses of effective and epistemic control. This fact can justify the use of both hands and face, normally simultaneously, in expressing effective modality. In the case of epistemic modality, the effective control sense has faded away and we are left with only epistemic control in the realm of the mental world. There are always vague or in-between situations where it is not easy to interpret the modal as clearly an effective or epistemic one. What the facial markers discussed in this study suggest is that they are more involved in expressing evaluative senses about the target process. Thus, in purely epistemic modality, the hands become less involved and the face becomes the main articulator.

However, the face also expresses the degree of the effective force. One explanation would be to propose that some elements on the face actually convey “level of exertion”. This can be effective exertion, prototypically level of physical force, but it can also be mental exertion, such as epistemic assessment. Some facial elements, such as HS-mouth, are in fact stance markers indicating subjective stance of the speaker toward the event. In conversations, the event being assessed or evaluated can be the one expressed by the

speaker or by the interlocutor. The HS-mouth indicates mental activity, mental operations or assessment. Its combination with different facial elements, mainly eyes and eyebrow, makes a variety of semantic domains all including an assessment or judgement sense.

The facial markers discussed in this chapter have been shown to have their basis in sensory and motor components of physical / mental activities of human beings. However, through what Langacker (2008) calls ‘ways of disengaging cognition’, they are now linguistic grammatical tools. According to Langacker (2008: 535-6), the interaction, at the physical level, with something in the world is affected through the body, primarily via sensory and motor organs. The brain plays a role in this engagement by processing including sensory input and motor command, that constitutes the interactive experience. A comparable processing takes place autonomously without any direct engagement with the world. This second activity is a simulation of the first.

It seems that HS-mouth, squinted eyes, and brow furrow, as they are used in modality contexts in ZEI, are sensory motor movements of facial muscles disengaged from direct interaction with the world (physical and mental effort when facing an obstacle) and simulated in communicative purposes. For example, HS-mouth appears on the face in cases of calculating, making a judgment or evaluation, comparing or trying to remember something even with no communicative purpose. During a conversation, this marker also expresses the subjective exertion of performing mental operations by simulation.

Chapter 6

6 Conclusions and outlook

In this dissertation, I have attempted to take the initial steps towards describing modality in ZEI and in signed languages in general, by analyzing two linguistic channels in the language: hands and face. Modality can be analyzed in two broad categories of necessity and possibility. In this study, I have described manual and facial markers of expressing necessity and possibility in ZEI. Moreover, I also have attempted to analyze the relation and interaction of facial and manual modal markers by applying a cognitive grammar framework.

6.1 ZEI Manual markers of modality

Based on the findings of this study, the most frequent manual modal markers of necessity in ZEI are BAYAD, MAJBUR, MIKHAM, MOHEM and HATMAN. The modal function of many signs coexists with another lexical or non-modal use of the sign in language. For example, MIKHAM is a desiderative verb, and MOHEM ‘important’ is an adjective in non-modality structures.

BAYAD is the most common necessity modal marker in ZEI. This sign is used in a variety of contexts covering many semantic domains including weak and strong obligation, either biological and physical or obligations forced by an authority, and also advisability. MAJBUR has more limited functions. It is normally used for root necessity which is an obligation forced by the general circumstances toward the agent to complete an action. MAJBUR indicates a more desperate sense of the agent under a strong external obligation.

MIKHAM originally shows the desire or willingness of the agent but it is used as a necessity marker as well. The use of MIKHAM is limited to the situations in which a strong desire based on a strong inner obligation is the source of necessity. MOHEM is the marker of advisability which is grammaticized from its original adjectival function with the meaning ‘important’. This sign is used when the signer gives advice to an unspecified agent or to the public with the purpose of showing the necessity or importance of some act in the pursue of something. The only epistemic necessity manual marker found in ZEI is HATMAN which is used for expressing certainty.

Regarding possibility modals, MISHE is the most frequent sign in ZEI conveying a wide range of possibility concepts. This sign is used for expressing root possibility, acceptability and permission. The other sign is MITUNE which is basically used for expressing physical-mental ability. BALAD is another ability marker, with more limited domain conveying only human skills. RAHAT is a marker of root possibility developed from its original adjectival meaning ‘comfortable’. This sign indicates a possibility sense of undertaking an action with a diffuse or mixed source of the potency: it is possible because the agent has capability of doing the action or because the external possibilities exist or both.

For the expression of epistemic possibility, ZEI signers use either MISHE for higher certainty and MOMKEN/ SHAYAD for a lower degree of certainty, both with conventionalized facial displays, specifically the horseshoe shape of mouth.

6.2 ZEI Facial markers of modality

While facial markers in sign languages and their grammatical functions have been studied in some sign languages, there is not much detailed analysis of the facial channel role and in a comparison with the manual channel in conveying grammatical concepts, including modality. I have attempted to not just describe the facial markers of modality, but also to find the way of analyzing the “labor division” of facial and manual channel in the expression of modality.

The most common facial markers of modality in ZEI are horseshoe mouth (HS-mouth), Squinted eyes, wide eyes and brow furrow. Lowered corners of the mouth, or horseshoe mouth is a common facial marker which appears in many diverse contexts. HS-mouth is very frequent in expressing possibility modals. It appears with or without manual modals. HS-mouth seems to have a schematic meaning that includes evaluative, calculative, or assessment senses, and adds a subjective value to the utterance. When it is articulated along with a modal, HS-mouth carries the epistemic component.

Squinted eyes is a common marker in expressing probability, doubt and uncertainty. This marker, and the other certainty marker, wide eyes, with eyebrows raising, are in a continuum of expressing doubt/certainty based on the context of the discourse, more specifically, based on the background presupposition about an event. Wide eyes indicate that some event is quite probable even though it is not in the same line of the addressee's expectation or general background assumption. Squinted eyes, on the other hand, mark the fact that some event is probable, and it is following the background presupposition.

Brow furrow that results in a distinct vertical line between the eyebrows is very common in both epistemic and effective modals, showing degrees of ‘exertion’. This marker is common mostly in non-epistemic modality to show the degree of possibility or necessity based on the conceptualizer’s knowledge or/and evaluation.

By applying a cognitive framework in classification of modals into two kinds of effective and epistemic modals, findings of this study suggest that facial markers have crucial roles in marking epistemic modals, while effective (non-epistemic) modals tends to be expressed on hands.

6.3 Areas for Further studies

Without a large corpus, studies on modality in ZEI will necessarily be limited. The markers of modality discussed in this dissertation were all taken from Tehrani version of ZEI. More studies are needed to include regional variations and also age and class variations into this research area.

Regarding facial markers described in this study, one important question to be answered is whether the facial channel is a grounding element (in CG account), or merely a speaker attitude towards an onstage element. This can be seen as a continuum regarding the degree of grammaticization, starting from non-grammaticized facial signs indicating speakers’ attitude (similar to adverbial facial markers) on one extreme and highly grammaticized epistemic modal markers on the other extreme. As Langacker (2017: 38) states:

"Grammaticalized systems are not the only means of indicating existential status. Also serving this function are a wide array of lexical and periphrastic expressions with varying degrees of grammaticization and systematicity. In a broader sense of the term—pertaining solely to semantic function—these too can be considered grounding elements. They are however less closely connected to the grounded process, being extrinsic to the clause (either external to it or an optional elaboration). Thus, they instantiate a generalized notion of grounding effected at a higher-level of organization."

The degree of grammaticization of modals differs not only between languages, but also between modal verbs within one language, and modal verbs may thus constitute grounding predications to a higher or lesser extent (Mortelmans 2006; Smirnova and Mortelmans 2011).

The expression of epistemic modalities in a particular language, is more on the grammatical end of lexical-grammatical continuum than non-epistemics (de Haan 2009's survey on European languages). It has been also claimed that more grammaticized forms are more subjective (Traugott 1989) and thus serve more diverse discourse functions. Further studies are needed to analyze the degree of grammaticization of facial markers in the domain of modality.

Another important line of study would be studies on separate muscle movements on the face and the role of each movement in conveying linguistic messages. How messages are conveyed by each individual action separately, and also with different combinations, needs to be analyzed. Even raised eyebrows and widened eyes, which seem to be perceived a chunk, are actually different markers that contribute different

information. Muscle movements of the lips and mouth area can also convey different meanings, and by combining with eye and eyebrow markers, a variety of meanings might emerge. The scope of the present study does not allow me for further investigation in the semantics of different face muscles in conveying linguistic and grammatical message. This can be an important further step in understanding of facial grammar.

The role of head movement is another feature to be studied in expressing modality. Phonologically, neck movement is limited in comparison with hands. However, three directions, backward, forward and sideward movements with at least two manners of sharp and soft movements could be semantically analyzed. More studies are needed to explore different semantic domains in which head and neck movement play grammatical roles.

Appendix: Interview Questions

Questions to elicit Necessity- Deontic modals

- 1- What are characteristics of a good driver in your opinion? Are you satisfied with traffic laws? Tehran streets/ Tehrani drivers? Have you (or anyone in your family) gotten caught by police while driving? What was the reason? Did you get fined?
- 2- What are the regularities of getting day-off from your work? How many paid leave days you have per month? Is it easy for you to talk to your boss for getting some days off in case of emergency or for vacations?
- 3- Tell me some memories from when you were a school kid. Were your teachers strict or easygoing? mean or friendly? How would they behave in regard to deaf kids? Would you take toys/story books with you to class when you were kid? Did the school have a uniform or you chose what to wear? Did students/teacher sign in class? If not, how about out of the class?

Question to elicit Necessity- weak obligation – External and internal advisability

- 4- What are your routine activities? Do you do exercise every day? What are benefits of doing exercise in a daily basis?
- 5- What are characteristics of a good driver in your opinion?
- 6- Which one do you think is a better attitude for parents? To give their children freedom of choice for their hair style and outfit or parents decide for their kid's fashion and tell them what to wear and what hair style they have? Why?
- 7- What age do you think is the best age for your kid to have a cellphone? Why?
- 8- Do you think the number of divorces is higher now comparing to the past? What are the reasons? What are your recommendations for couples to get along well and not get divorced?
- 9- I have migraine (one of the interviewer's actual problem). What are helpful food/drink or activities for migraine?
- 10- What do you think about people who use fingerspelling a lot in their signing? When do you usually use fingerspelling?

Question to elicit Possibility- Mental /Physical ability (participant internal)

- 11- What are activities or careers in which the deaf are more successful at? Cooking, art, driving, carpentry, office works, teaching, etc.? Why? Are they better than hearing people or equal? How?

12- In what way your daily life has been changed comparing to 30 years ago? (for elderly people)

Question to elicit Possibility- Non deontic- Participant external

13- Do you go to Karaj (or other towns near Tehran that the interviewee have some affiliations to that)? How often do you go? How long does it take? By car? By metro? whatever they answer the interviewer asks about a shorter time (for example “if you go faster will you get there in 30 min?” and then discuss.

14- What would you do if some emergency comes up and you don’t have enough money for that? Do you have people around to borrow money from? What are different options?

15- What would you do if you are driving and run out of gas in the middle of a road? (discuss different options)

16- Is this room suitable for inviting 50 /100 people in? (discussion, negotiation and estimating the size of the room for different number of people with the interviewer)

17- Tell me about your general problems as a deaf when you go out: shopping, restaurant, doctor, etc.

18- In what ways Tehrani deaf culture is different from other cities deaf culture?

Question to elicit Epistemic Possibility and Necessity

19- You are passing by a bank, suddenly you see a group of people scared and injured are running away from the bank and then a police car. What do you think has happened?

20- Imagine you have a friend who never leaves the house. Whenever you want to meet her/him you just show up in their house, and your friend is there. One day, you go and knock the door, text your friend that you are on the door, but no one opens the door, no matter how long you wait. What would you think?

21- Do you spare money to poor people in the street when they come to you for money? (if yes, what if they are addicts and spend money on drugs? If not, why?)

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