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## THE SEMANTIC-PRAGMATIC ANALYSIS OF PERSIAN MODAL VERBS BASED ON PAPAFRAGOU'S MODEL

### **Abstract**

This paper aims at analyzing the semantics and pragmatics of Persian modal verbs based on Papafragou's (1998, 2000) relevance-theoretic model. Persian modals are defined in terms of logical relations and propositional domains. According to the findings of the research, two of the three modals, namely, *šodan* and *tavān* express the logical relation of compatibility with respect to different propositional domains: the three forms *mišavad*, *mišod* and *mišode* are unspecified with respect to their propositional domains and take them directly from the context, whereas *betavān* and *bešavad* accept the desirability domain. *Mitavān* also expresses compatibility in relation to the propositions in the factual domain. However, *bāyad* is the only modal that encodes the logical relation of entailment and is unspecified with respect to the type of propositional domain it accepts.

### **Keywords**

modal verbs, lexical semantics, pragmatics, Persian, relevance, metarepresentation

## **1. Introduction**

Modality is basically concerned with the notions of possibility and necessity. In natural languages modality commonly reflects the speaker's subjective attitudes

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and opinions about the necessity and possibility of the truth of the proposition. Lyons (1977) and Huddleston & Pullum (2002) define modality along the following lines respectively:

[Modality refers to] ... the speaker's opinion or attitude towards the proposition that the sentence expresses or the situation that the proposition describes.

Modality is centrally concerned with the speaker's attitude towards the factuality or actualization of the situation expressed by the rest of the clause.

Both of these definitions emphasize some of the most important notions involved in the definition of modality in natural languages, including subjectivity, proposition, speech act, factuality and modal kinds. They differ in the way they accommodate the two basic subtypes of modality in natural languages, i.e. epistemic and deontic: in the first definition "opinion" refers to epistemic modality and "attitude" refers to deontic modality, while in the second definition "factuality" refers to epistemic modality and "actualization" refers to deontic modality. Both of these definitions do not include the notions of possibility and necessity as the "core concepts in modality" (Huddleston & Pullum 2002).

Linguists usually mention four kinds of modality: alethic, epistemic, deontic and dynamic. Some linguists, including Palmer (1986, 1990, 2003) and Huddleston & Pullum (2002) advocate a three-way distinction in natural language modal types recognizing epistemic, deontic and dynamic modalities, while others like Coates (1998), Sweetser (1982, 1990), Groefsema (1995) and Papafragou (2000) prefer a two-way distinction between epistemic and non-epistemic or root modality.

Alethic modality is related to the "logical or absolute necessity or possibility" (von Wright 1951) of the truth of propositions and has little place in natural languages. Epistemic modality is concerned with "the necessity or possibility of an inference drawn from available evidence" (Papafragou 2000: 3). Huddleston & Pullum (2002: 178) define this type of modality as "the speaker's attitude to the factuality of past or present time situations". It is the modality of propositions (rather than actions) and expresses "judgments about the probability of the truth of the propositions" (Palmer 1990: 5). Deontic modality is concerned with "the necessity and possibility of acts performed by morally responsible agents" (Lyons, 1977: 823), or to use Huddleston & Pullum's words, it is concerned with "the speaker's attitude to the actualization of future situations". According to Papafragou (1998: 2), dynamic modality is related to "cases where circumstances in the real world make possible or necessary the actualization of a state of affairs". In the following sentences the English modal verbs *must*, *may*, *can*, *should* and *ought to* exemplify these four types of modality, respectively:

- (1) a. A triangle must have three sides. (Crystal 2003: 18)

- b. If Alfred is a bachelor, Alfred must be unmarried. (Lyons 1977: 788)
- c. A man may be older than his own uncle. (Kearns 2000: 53)
- (2) a. You must be Joseph.
- b. Something must be wrong with the thermostat.
- c. You may have left the keys at home.
- d. The next road on the left should/ought to be King Street. (Huddleston & Pullum 2002:181)
- (3) a. You must clean up this mess at once. (Huddleston & Pullum 2002:183)
- b. You may have one more turn. (p. 183)
- c. You should/ought to tell your mother. (p. 186)
- (4) a. I know the place. You can get all sorts of thing here. (Palmer 1990: 84)
- b. She can run the marathons in under three hours. (Huddleston & Pullum 2002: 185)
- c. Now that she has lost her job she must live extremely frugally. (p. 185)

As the above examples show, the same set of lexical verbs in English is capable of expressing different kinds of modal meanings. This semantic feature of modal expressions, i.e. their ability to convey different modal senses in different contexts, is “widely acknowledged in the linguistic literature” and has “a robust cross-linguistic presence” (Papafragou 2000: 4). Different descriptive approaches have been developed to provide a unified characterization of the systematic meaning multiplicity of English modal verbs. In the literature on modality there are three main approaches to the semantics of modals: ambiguity, polysemy and monosemy approaches. In this paper after reviewing some of the most important ambiguity/polysemy/monosemy-based approaches to modal semantics in English and the ambiguity-based analysis of these verbs in Persian and highlighting the inadequacies of these accounts, Papafragou’s (1998, 2000) relevance-theoretic semantic-pragmatic model which takes a unitary approach to modal semantics will be applied to Persian modal verbs.

## 2. Former studies

In the literature on modality there are three main views on the semantics of modals. *Ambiguity-based* treatments of modality assume “massive lexical ambiguity” in the lexical semantics of the modals: they assign to each modal verb “a particular cluster of distinct modalities” (Papafragou 2000: 22) and consider modal verbs as ambiguous between different (epistemic and root; deontic and dynamic) senses. The *polysemy-based* treatment of modal meanings as developed by Sweetser (1990), argues for “a more systematic relation between the different

meanings of the modals” (Groefsema 1995: 58) compared to ambiguity-based treatments: on this view “the root and epistemic meanings are distinct” and “modals are ambiguous between a root and an epistemic sense”, but “there is a regular metaphorical mapping between the two domains” (p. 58). On *unitary or monosemous* accounts of modality “modals have a single unitary meaning each” and “the apparent ambiguities are a result of the interpretation of an utterance containing the modal in a particular context” (p. 55). In what follows these approaches will be exemplified and discussed.

## 2.1. Ambiguity-based approaches

### 2.1.1. Palmer's model

Palmer (1990) developed an ambiguity-based treatment of modality by examining the semantics of modals along the two dimensions of kind and degree. Along the first dimension he distinguished between three modal kinds – epistemic, deontic and dynamic – and along the second dimension he distinguished between three degrees, i.e. possibility, necessity and a third unnamed degree to account for the epistemic and dynamic uses of *will* and the deontic use of *shall*. He arranged the modals based on these kinds and degrees in the following matrix (Palmer, 1990: 37):

|             | Epistemic | Deontic | Dynamic |
|-------------|-----------|---------|---------|
| Possibility | MAY       | MAY/CAN | CAN     |
| Necessity   | MUST      | MUST    |         |
| ?           | WILL      | SHALL   | WILL    |

Table 1: Palmer's semantic analysis of English modal verbs (adopted from Palmer 1990: 37)

But the range of modal subtypes he had to recognize, especially in the realm of dynamic modality, to account for the full range of meanings expressed by modal verbs is actually quite wide. For example, he argued that “there is yet another type of modality – neutral (or circumstantial), to indicate what is possible in the circumstances. [...] Neutral modality will, however, be treated as a subclass of dynamic modality, the other subclass being subject-oriented” (p. 37). *Can*, *must* and *may* can express this type of modality.

As Groefsema (1995: 55) observes, the problem with this approach and other ambiguity-based treatments of modality (including polysemy-based treatments) is that “even when more and more fine-grained categories of modality are distinguished, there seems to be no one-to-one correspondence between the kinds

and degrees of modality that one can distinguish, and the different meanings of the modal verbs". This is due to the existence of intermediate cases such as *indeterminate* examples in which it is impossible in principle to decide between two distinct modal senses. For example, *can* on Palmer's model has three meanings (subject-oriented dynamic possibility or ability, circumstantial dynamic possibility and deontic possibility or permission). However, in (8) and (9) below it cannot be assigned any one of these senses; it is indeterminate between the two subtypes of dynamic modality, i.e. subject-oriented possibility (ability) and circumstantial dynamic possibility:

- (8) John can read Greek. (Palmer 1990: 199)
- (9) The people who cannot very easily raise their wages. (p. 85)

Sentence (8) can be paraphrased dynamically as "It is possible for John to read Greek", meaning that it is circumstantially possible for John to read Greek, for example because people know Greek. But it can also refer to John's ability and therefore the sentence is indeterminate between two dynamic senses of *can*. Similarly in (9) it is not possible to say whether the speaker is talking about the ability of the people to raise their wages or to their general circumstances. In the same way in (10) below *can* is indeterminate between deontic and dynamic possibility readings and in (11) *must* indicates some indeterminacy between neutral and deontic senses:

- (10) You can be the first person to join our forces at such a young age. (Papafragou, 2000: 23)
- (11) If the ratepayers should be consulted, so too must the council tenants. (Palmer, 1990: 113)

In addition to indeterminacy in the meaning of the modals when accounted for in such approaches, the proponents of ambiguity/polysemy-based treatments are forced to recognize cases in which different categories of modality merge completely. *Merger* occurs, according to Coates (1995: 61), where "two meanings co-exist in a both/and relationship". To put it differently, "two readings are available for a given utterance, but instead of having to choose one meaning and discard the other (as with ambiguous examples), the hearer is able to process both meanings" (p. 61). For example, in (12) below deontic and dynamic possibility meanings merge and in (13), (14) and (15) epistemic and root modalities actually coincide:

- (12) Stop that! You'll wake the whole building. Wally can't go any place at this hour – (Ehrman, 1966: 15)
- (13) A: Newcastle is a jolly good beer.

B: Is it?

A: Well it ought to be at that price. (Coates, 1983: 17)

- (14) It is important to note that where high concentrations are theoretically possible in the plant evaporator, the time required to build them may be considerable. (Coates, 1983)
- (15) The quality of the final product must be influenced by the quality of the raw material, and the methods of processing may influence its nutritional quality. (Coates, 1983)

The recognition of the phenomena of merger and indeterminacy “may be viewed as a threat to the overall validity of the ambiguity position” (Papafragou 2000: 25) as such examples actually show that in practice the so-called ambiguous modal verbs do not lend themselves to disambiguation (resist disambiguation) while “[o]n the view that modals are ambiguous between different meanings we would expect that they can be disambiguated in all cases” (Groefsema 1995: 57). However, we saw that “there are cases in which it [straightforward disambiguation] is not possible, which leads to indeterminacy and merger” (p. 57).

Yet there is other criticism to be expressed against ambiguity/polysemy treatments. Proponents of monosemy-based approaches further criticize these views on the basis of another range of examples containing modal verbs which “do not fit any of the distinguished meanings, but which cannot be accounted for by calling them cases of indeterminacy or merger, either” (Groefsema 1995: 57). In fact such examples demonstrate that “the proposed set of senses fails to capture the range of meanings which the modals contextually convey” (Papafragou 2000: 23). These examples are what Palmer (1990: 83) describes as “an ‘extended’, ‘implicative’ use” for *can* and analyses them in terms of four subcategories of senses, including offers and suggestions. Consider *can* in examples (16) – (17) (taken from Palmer, 1990: 86) and in examples (18) – (20) (taken from Walton, 1988: 103) and also consider *must* in (21) – (23):

- (16) Yes, we can send you a map, if you wish.
- (17) Do come early and we can have a drink.
- (18) You can clean the house for once.
- (19) Can you pass the salt?
- (20) Can I get you a drink?
- (21) You must come to dinner sometime. (Papafragou, 2000: 24, Groefsema 1995: 57)
- (22) Well, you must say what you want for a present. (Palmer 1990: 72)
- (23) Oh, you must come around and see it. (p. 72)

None of the semantic categories distinguished by Palmer (1990) can account for the meanings these modals communicate in these sentences. Proponents of the ambiguity/polysemy treatments of modality “may attempt to incorporate such

meanings in two ways: either by introducing semantic labels and thus inflating an already overloaded semantic component [...], or by hiving them off to 'conventions of usage' or 'pragmatic extensions' (Palmer 1986, 1990). In either case, "descriptive adequacy will be achieved only at the expense of a truly explanatory account of the semantics and pragmatics of the modals" (Papafragou 2000: 24).

Palmer rarely succeeds in providing a modal verb with just one sense as he is forced to rely solely on the limited context included in each modal utterance to provide the modal verb with its senses. This limited context forces Palmer to adopt an uncertain tone in many cases. In fact Palmer actually analyses modality in terms of modality, by talking about the probability and possibility of the truth of the senses he assigns to each modal verb. The following three extracts chosen from Palmer can illustrate this point. Note the frequency of the terms that indicate modality, ambiguity and indeterminacy in the arguments presented which have been underlined and are the direct result of paying little attention to the role of context:

(I) When a modal verb is used to refer to the future with a simple form of the verb following it, there is often ambiguity between an epistemic and a deontic interpretation, or else a deontic interpretation is much more likely. Consider:

John may/might/must/should/will/would come tomorrow.

Only with *might* is an epistemic interpretation clear. With *may* either interpretation is possible ('It is possible that ...' or 'I give permission for ...'). With *must* a deontic interpretation is far more likely, unless the context clearly suggests an epistemic sense, while *should* is ambiguous. With *will* and *would* it is difficult, if not impossible, to distinguish an epistemic meaning from that of the *will* of futurity [...], or the interpretation may be in terms of dynamic *will* ('willing to'). (Palmer 1990: 66-7)

(II) He must come tomorrow.

This would almost certainly be interpreted in terms of obligation. An epistemic sense is, however, possible where the context makes it more likely, e.g.:

Something must happen next week.  
It must rain tomorrow.

These sentences could, of course, refer to what is necessary in a dynamic or even a deontic sense, but they are more likely to indicate what the speaker thinks will happen and so to be interpreted epistemically. But the ambiguity remains. (Palmer 1998: 54)

(III) There are many examples where it is difficult to be sure whether we have dynamic or epistemic modality. It is not at all clear that the following are epistemic:

Should only take three days for the survey report to be in to the building society.  
 So he should be around sort of between half past two and half past three.

There are two examples with the word *reason* in them. It is difficult to decide whether this indicates a reason for conclusion (epistemic) or a reason for being (dynamic). The word *reason* can itself be interpreted either dynamically or epistemically:

There's no reason why it should be surprising.  
 There is no reason why they should be simultaneous.

In these two, of course, *should* appears in the subordinate clause and it could be argued that this is not strictly comparable with other examples. There is, then, indeterminacy here between epistemic and dynamic modality. It is possible to understand why this is so: if we consider that it is reasonable for an act to take place, we may equally consider that it is reasonable to expect that it will. (Palmer 1990: 60-1)

Sentences such as "it is not (at all) clear ...", "there is ambiguity/indeterminacy ..." and sentences that include modal terms such as *could*, *probably*, *(un)likely*, *may* and *might* are abundant (See e.g. pp. 55, 85, 108, 110, 124, 125, 126, 130, 179, 183, 184, 187). What is obvious is that speakers and hearers do not get stuck in these modal calculations when trying to determine the meaning of a modal in a sentence. They actually do it in an instance.

Another range of examples which the proponents of ambiguity/polysemy-based treatments fail to deal with systematically includes modal utterances that have implicatures in addition to their explicatures. Consider the following examples (taken from Palmer 1990: 71):

- (24) Oh, you can leave me out, thank you very much.
- (25) I'm Dr Edgton now, so you can observe my new status.
- (26) You may take it from me.
- (27) You may rest assured.

With respect to such sentences, Palmer (1990: 71) notes that "[c]uriously, [CAN and MAY are] often used to convey a command, often of a brusque or somewhat impolite kind" and adds that

[a]lthough a separate section has been devoted to this 'command' use of CAN and MAY, it is best seen not as an independent meaning of the verbs, but as an extended or implied meaning from the permission use [...]. An expression of permission may be used to indicate that the speaker wants the action to be performed. But the fact that there are differences in the meaning of CAN and MAY here shows that the use has been conventionalized, and is not directly predictable from permission. (Palmer 1990: 72)



On a relevance-theoretic semantic-pragmatic account, the modals in these sentences will have their usual sense (permission) at the level of explicature, and only when, based on the principle of optimal relevance, the hearer recovers the implicatures of these utterances the command sense becomes apparent.

### 2.1.2 Rahimian's analysis

Rahimian (1995: 72) introduces Persian modal verbs in the following table:

| BÂYAD | Invariable     | <i>Bâyad</i>                         |                  |
|-------|----------------|--------------------------------------|------------------|
| TAVÂN | IMPF + NPS     | Non-past Imperfective                | <i>mi-tavân</i>  |
|       | NIN + NPS      | Subjunctive                          | <i>be-tavân</i>  |
| ŠODAN | IMPF + NPS-3SG | Non-past Imperfective                | <i>mi-šav-ad</i> |
|       | NIN + NPS-3SG  | Subjunctive                          | <i>be-šav-ad</i> |
|       | IMPF + PS-3SG  | Past Imperfective                    | <i>mi-šod-e</i>  |
|       | IMPF + PS-PTP  | Imperfective Participle(special use) | <i>mi-šod-e</i>  |

Table 2: Possible Forms of Persian Modal Verbs (adapted from Rahimian 1995: 72)

Rahimian (1995: 93-102) applied Palmer's (1990) ambiguity-based approach of modality to Persian modal verbs. He assigned epistemic, deontic and dynamic senses to Persian **BÂYAD** and used the following sentences to exemplify these different senses, respectively:

- (28) *mehdi bâyard servatmand Ø-bâš-ad [ke yek mâšin-e dah melyun*  
Mehdi MUST wealthy NIN-be.NPS-3SG [that one car-LINK ten million  
*tumân-i xarid-e ?ast-Ø*  
Tuman-INDEF buy.PS-PTP PERF. NPS-3SG  
Mehdi must be wealthy [because he has bought a car for 10,000,000 Tuman]  
(p. 99)
- (29) *to bâyard bištâr dars be-xân-i*  
you MUST more lesson NIN-read.NPS-2 SG  
You should study more (p. 100)
- (30) *?ali ?az ?ân bačče-hâ-i ?ast-Ø ke bâyard be hame-ye*  
Ali of that child-PL-INDEF be.NPS-3SG CLSUB MUST to all-LINK  
*čiz-hâ-ye xâne dast be-zan-ad*  
thing-PL-LINK house hand NIN-hit.NPS-3PL  
Ali is one of those children who has to touch everything in the House (p. 101)

Rahimian (1995) assigned different modalities (epistemic, deontic and dynamic) to **ŠOD-AN**. Consider **Mi-šav-ad** (as the non-past imperfective form of ŠOD-AN) in (31), (32) and (33) below where it indicates epistemic, deontic and dynamic modality respectively:

- (31) *mi-šav-ad ?al?ân pedar-am dar šahr bâš-ad*  
 IMPF-MAY.NPS-3SG now father-I in city NIN-be.NPS-3SG  
 My father might be in town now (p. 102)
- (32) *?agar ?âmâde n-ist-i mi-šav-ad fardâ ?emtehân*  
 if ready NEG-be.NPS-2SG IMPF-MAY.NPS-3SG tomorrow exam  
*be-dah-i*  
 NIN-give.NPS- 2SG  
 If you are not ready, you may take the exam tomorrow (p. 103)
- (33) *bâ ?in hoquq mi-šav-ad mâh-i panjâh dolâr pasandâz*  
 with this salary IMPF-MAY.NPS-3SG month-INDEF fifty dollar saving  
*bo-kon-am*  
 NIN-do.NPS-1SG  
 With this salary I can save \$50 per month (p. 104)

Rahimian (1995: 104) assigned dynamic and deontic senses to **mi-šod-Ø** (as the past form of ŠOD-AN). He mentioned that dynamic **mi-šod-Ø** has two uses: “(a) expressing past time or (b) being used in moralized conditionals expressing counter-factuality in the present, past and future”. The following examples (taken from Rahimian, 1995: 105) can indicate the indeterminacy of sentences with **mi-šod-Ø** between these two senses, in the past, present and future time respectively:

- (34) *pârsâl bâ ?in hoquq mi-šod-Ø mâhi panjâh dolâr*  
 last year with this salary IMPF-MAY.PS-3SG month-INDEF fifty dollar  
*pasandâz Ø-kon-am*  
 saving NIN-do.NPS-1SG  
 (α) Last year, with this salary I was able to save per month \$50  
 (β) If I had this salary last year, I could have saved \$50 per month
- (35) *hâla bâ ?in hoquq mi-šod-Ø mâh-i panjah dolâr*  
 now with this salary IMPF-MAY.PS-3SG month-INDEF fifty dollar  
*pasandâz Ø-kon-am*  
 saving NIN-do.NPS-1SG  
 (α) Now with this salary I would be able to save \$50 per month  
 (β) If I had this salary now, I could save \$50 per month
- (36) *[?agar hoquqam ?afzâyeš mi-âft-Ø] dar ?âyande*  
 [if salary-I increasing IMPF-find.PS-3SG] in future  
*mi-šod-Ø mâh-i panjâh dolâr pasandâz Ø-kon-am*

IMPF-MAY.PS-3SG month-INDEF fifty dollar saving NIN-do.NPS-1SG  
(α) I would be able to save \$50 per month in the future  
(β) If I had a pay rise, I would be able to save \$50 per month in the future

Rahimian suggests that deontic *mi-šod-Ø* in the following sentences “indicates a counterfactual situation in one of past, present and future times where the subject was deontically permitted to take the exam the next day” (p. 103):

- (37) *?agar do mäh qabl ?âmâde na-bud-i mi-šod-Ø mäh-e*  
if two month before ready NEG-be.PS.2SG IMPF-MAY.PS-3SG month-  
LINK  
*gozašte ?emtehân be-dah-i*  
past exam NIN-give.NPS-2SG  
If you had not been ready two months ago, you would have been able to take the  
exam last month (p. 103)
- (38) *?agar ?al?ân ?âmâde na-bud-i mi-šod-Ø fardâ ?emtehân*  
if now ready NEG-be.PS.2SG IMPF-MAY.PS-3SG tomorrow exam  
*be-dah-i*  
NIN-give.NPS-2SG  
If you were not ready now, you would be able to take the exam tomorrow (p.  
104)
- (39) *?agar fardâ ?âmâde na-bud-i mi-šod-Ø hafte-ye ?âyande*  
if tomorrow ready NEG-be.PS.2SG IMPF-MAY.PS-3SG week-LINK future  
*?emtehân be-dah-i*  
exam NIN-give.NPS-2SG  
If you were not ready tomorrow, you would be able to take the exam next week  
(p. 104)

Rahimian (1995: 106) argued that **TAVÂN** “is just used in impersonal constructions. It has only dynamic and deontic uses, which are the same as for ŠOD-AN. However, since deontic ŠOD-AN takes both impersonal and personal verbs, it has a wider use than TAVÂN”. TAVÂN is used deontically in (40) and dynamically in (41):

- (40) *mi-tavân jarime râ dah ruz-e digar pardâxt*  
IMPF-CAN.NPS penalty COMP ten day-LINK other pay.PS  
The fine can be paid ten days later
- (41) *xâne râ mi-tavân bâ qîmat-e xub-i foruxt*  
house COMP IMPF-CAN.NPS with price-LINK good-INDEF sell.PS  
One can sell the house for a desirable price

Rahimian's (1995) semantic analysis of Persian modal verbs can be summarized in the following matrix:

|             | Epistemic | Deontic      | Dynamic      |
|-------------|-----------|--------------|--------------|
| Possibility | ŠOD-AN    | ŠOD-AN/TAVÂN | ŠOD-AN/TAVÂN |
| Necessity   | BÂYAD     | BÂYAD        | BÂYAD        |

Table 3: Rahimian's (1995) Semantic Analysis of Persian Modal Verbs

As an ambiguity-based treatment, this semantic analysis is subject to the criticisms expressed against Palmer's approach: firstly, there are intermediate cases such as indeterminate examples and merger which cannot be accounted for in terms of this proposed set of senses. Consider example (42) as a case of indeterminacy between the deontic and dynamic uses of ŠOD-AN:

- (42) *mi-šav-ad ?in lebâs râ be-xâr-i, ?arzân ?ast-Ø*  
IMPF-MAY.NPS-3SG this dress COMP NIN-buy.NPS-2SG cheap be.NPS-3SG  
You can buy this dress, it is cheap

In this sentence it is not clear whether it is the cheapness of the dress which makes it possible for the buyer to buy the dress (circumstantial dynamic) or the speaker is willing to allow the hearer to buy the dress due to its low price (deontic). Also consider (43) as a case of merger in which both the deontic and dynamic senses of BÂYAD seem to co-exist:

- (43) *bâ ?in nomre-hâ to bâyard bištar dars be-xân-i ta*  
with this grade-PL you MUST more lesson NIN-read.NPS-2SG until  
*vâhed-hâ-yat râ pâss Ø-kon-i*  
course-PL-you COMP passing NIN-do.NPS-2SG  
With these low grades you must study more so that you can pass the courses

Here studying more has been considered as necessary both in view of the bad educational status of the student addressed and the danger of failing the courses (i.e. dynamic *bâyad*) and also in view of speaker's preferences which can be considered to be the student's parent or teacher (i.e. deontic *bâyad*).

The following sentences exemplify the uncategorizable uses of modal verbs in Persian which cannot be accounted for on the basis of the cluster of meanings assigned to these verbs by Rahimian:

- (44) *bâyad ?emšab be mehmâni-e man bi-âi-i*  
MUST tonight to party-LINK I NIN-come.NPS-2SG  
You must come to my party tonight.

According to Rahimian (1995: 101) “[h]ere the speaker is giving a pressing invitation rather than command or order”. In Rahimian’s matrix ‘invitation’ has no place. In other words, this ambiguity-based treatment cannot systematically accommodate this use of *bâyad* and similar uses of other Persian modals as indicated by the following sentences:

- (45) *mi-šav-ad barây-e tatil-ât-e noruz be šomâl*  
IMPF-MAY.NPS-3SG for-LINK holiday-PL-LINK Noruz to north  
*safar Ø-kon-im*  
travel NIN-do.NPS-1PL  
We can travel to north during Noruz holidays
- (46) *mi-tavân barây-e tatil-ât-e noruz be šomâl safar kard*  
IMPF-CAN.NPS for-LINK holiday-PL-LINK Noruz to north travel do.PS  
We can travel to north during Noruz holidays

The above utterances represent the ‘suggestion or offer use’ of *mi-šav-ad* and *mi-tavân* which has not been predicted by Rahimian’s matrix and must be accounted for separately as a special use of these verbs on this account. The existence of such examples which are not analyzable in terms of the cluster of modal senses as assigned to the Persian modal verbs can justify the attempt to apply new approaches to account for the semantics of these verbs in a more systematic way.

## 2.2 Polysemy-based approach

Sweetser (1990) developed the polysemy-based treatment of modal verbs. Unlike traditional ambiguity-based treatments which analyze modal senses as distinct and unrelated, Sweetser (1990) believes that there is a systematic metaphorical relation between the distinct (root and epistemic) senses of the modals. According to her, “people generally use the language of the external world to apply to the internal mental world, which is metaphorically structured as parallel to that external world, and that this can account for the different meanings of the modals” (Groefsema, 1995: 58). On Sweetser’s model

[r]oot modals are taken to encode force-dynamic notions in the external world. For instance, *may* encodes the existence of a potential but absent barrier, *must* a positive compulsion, and *can* either a positive ability on the part of the doer, or some potential force/energy. These notions are extended metaphorically into the internal mental domain and give rise to epistemic meanings: *may* and *must* thus come to encode barriers or forces operating in the domain of reasoning. (Papafragou 2000: 26)

Papafragou (2000) compares sentences (47) and (48) below and their pragmatically enriched paraphrases given as (47') and (48') to exemplify the metaphorical mapping between the root and epistemic senses of *may* and explains that on Sweetser's model "it is the task of pragmatic interpretation processes to decide which of the two domains (root or epistemic) is the intended one, i.e. to resolve the structured polysemy in the modal semantics" (p. 27):

- (47) You may spend this sum anyway you wish.
- (47') You are not barred (by some or other authority) from spending this money anyway you wish.
- (48) The butler may have committed the murder in the meantime.
- (48') I am not barred by my premises from the conclusion that the butler has committed the murder in the meantime.

Groefsema (1995) and Papafragou (2000) offer several arguments against this approach. For example, Papafragou (2000: 27) argues that while in other examples of lexical polysemy in natural language the process of metaphorical mapping relates two independent and distinct senses, "[i]n the case of modals [...] the senses allegedly linked through metaphor are not so distinct as the range of indeterminate examples [...] has demonstrated". In fact as Groefsema (1995) also noted, indeterminate examples and cases of merger are problems that Sweetser's (1990) account, like that of Palmer's (1990) should face as treatments that consider modals to be ambiguous between root and epistemic senses. Papafragou (2000) further points out that the application of the proposal based on metaphorical mapping is limited in various ways: "an obvious case is positive *can*, which is not used epistemically. There is no motivation for this fact in Sweetser's account as she herself acknowledges (1990: 154)".

### 2.3 Monosemy-based approaches

In this section two main relevance-theoretic monosemous approaches to modality will be reviewed. One developed by Groefsema (1995) and the other by Papafragou (1998, 2000). On these models "the failure of the proponents of polysemy view to account satisfactorily for cases of indeterminacy, merger, and uncategorizable uses of the modals justifies the attempt to explain the meanings of the modals in terms of basic meanings rather than in terms of ambiguity" (Groefsema 1995: 60). The proponents of relevance-theoretic monosemy-based treatments assign unitary meanings to modals and account for the different meanings that modals actually convey in different contexts in terms of the interaction between the basic unitary semantics proposed for each modal verb and

the assumptions available in the context of the modal utterance. It is the relevance-theoretic considerations that guide the hearer to recover the set of assumptions that bear on the specific meaning of the modal in context and enrich or develop the incomplete logical form produced by linguistic decoding processes into a complete propositional form.

### 2.3.1 Groefsema's model

Groefsema (1995) assigned to each modal verb one basic meaning:

- Can: p is compatible with the set of all propositions which have a bearing on p
- May: There is at least some set of propositions such that p is compatible with it
- Must: p is entailed by the set of all propositions which have a bearing on p
- Should: There is at least some set of propositions such that p is entailed by it

The notion of *bearing* is developed actually to “focus the addressee’s attention on all the EVIDENCE (of whatever nature, epistemic or otherwise) for the proposition expressed by the rest of the utterance” (pp. 62-3) or in other words, to focus the addressee’s attention on the set of propositions from which p follows or on which p is dependent. The set of assumptions that have a bearing on p are actually supplied pragmatically during the interpretation process. Groefsema (1995) defines “bearing”, as a formal relation between propositions, technically along the following lines (based on Papafragou, 2000: 36):

A proposition P positively has a bearing on proposition Q iff

- a) [Q] or [~Q] follows from P, or
- b) [Q] or [~Q] follows from P and the minimal set of propositions X which together with P will yield [Q] or [~Q] (condition: [Q] or [~Q] doesn’t follow from X alone).

A proposition P negatively has a bearing on a proposition Q iff

- a) [Q] or [~Q] follows from ~P
- b) [Q] or [~Q] follows from ~P and the minimal set of propositions X which together with [~P] will yield [Q] or [~Q] (condition: [Q] or [~Q] doesn’t follow from X alone).

To see how this model works, consider the following example (taken from Groefsema 1995: 63). Imagine that (49) is exchanged between a number of workers who are discussing their daily schedule:

- (49) (a) A: Who is doing what?
- (b) B: The painters can paint the doors.

Based on the proposed semantics for *can* on this model, (49b) corresponds to the following logical form:

- (49b')  $p[\text{The painters paint the doors}]$  is compatible with the set of all propositions which have a bearing on  $p$ .

This logical form “focuses the addressee’s attention on the set of all propositions that have a bearing on  $p$ , such as that the painters have the ability to paint, that the doors are ready for painting, that painting the doors will not interfere with the other jobs that have to be done, that the paint and brushes are ready, etc. This, then, gives us the intuitive interpretation of (49b) as expressing that it is possible for the painters to paint the doors today” (p. 64). It may also gain relevance by interacting with other contextually available assumptions and producing contextual implications.

Papafragou (2000) considers Groefsema’s account as a step forward in modality studies and emphasizes that she agrees with a lot of individual points in this analysis, especially with the bare modal semantics, yet there are a number of arguments which Papafragou has developed against the details of this account.

Firstly, Papafragou argues that the crucial notion of bearing especially negative bearing, is “artificial when one considers how modals are actually used in communication” (p. 37); when producing or interpreting modal utterances, speakers and hearers do not really reason along the following lines as is suggested by Groefsema’s (1995) definition of “bearing”: “ $p$  is entailed by the set of all propositions which positively/negatively have a bearing on  $p$ ” – where these propositions are the following for positive bearing (based on Papafragou 2000: 37-8):

- a) propositions which entail  $p$  or  $\sim p$
- b) propositions which are members of the minimal set of propositions which jointly entail  $p$  or  $\sim p$

and are the following set of propositions in negative bearing:

- a) propositions whose negation entails  $p$  or  $\sim p$
- b) propositions whose negation is a member of the minimal set of propositions which jointly entail  $p$  or  $\sim p$ .

Papafragou observes that in practice (while analyzing actual modal utterances) Groefsema herself abandons her technical artificial notion of negative bearing and “makes exclusive use of positive bearing in conjunction with a pretheoretical notion of evidence” (p. 38) and “this is no coincidence, since both of these notions



hook onto something intuitively closer to modal meaning” (p. 38) than their formal artificial counterparts as primarily defined by Groefsema.

Secondly, Papafragou (2000: 38-9) rejects Groefsema’s belief that “only on some occasions is the hearer justified in looking for the specific propositions that have a bearing on p” and argues that “the hearer has to recover at least a broad specification of the sort of propositions that have a bearing on p, so that he can retrieve one or other type of modal interpretation”. Take the following example:

(50) Sue may like to have this one. (Groefsema, 1995: 68)

According to Groefsema (1995), if Ann utters (50) to Bruce in a context in which they are looking through a pile of books they want to get rid of, recovering the basic meaning of the modal is relevant enough for Bruce on its own right and if Bruce trusts Ann he does not need to recover the exact set of assumptions Ann has in mind about what Sue likes. But Papafragou (2000: 38) argues that even in such cases “the hearer had to compute the type of evidence (i.e. epistemic), even though not the individual assumptions, which the communicator entertained and used as grounds for her utterance”.

In the next part Papafragou’s (1998, 2000) approach to modality which is another relevance-based account will be shortly discussed. As a monosemy-based account, it must be included in the present subsection, i.e. 2.3, which deals with monosemy-based approaches. But for a better presentation of the model and its many parts and subparts, we will devote a separate subsection to it and analyze it as 2.4.

## **2.4 Papafragou’s model**

The discussion of Papafragou’s (1998, 2000) model will be presented in four parts: firstly, the notions of the descriptive and interpretive use of propositions as developed in relevance theory will be presented on which Papafragou (1998, 2000) has built her notion of propositional domains and her metarepresentational hypothesis; secondly, Papafragou’s (1998, 2000) propositional domains will be discussed in details; thirdly, the semantics and finally, the pragmatics of modal verbs will be offered.

### **2.4.1 Descriptive and interpretive use of propositions in relevance theory**

Sperber & Wilson (1995: 228) argue that propositional forms can be used and manipulated by the mind in two basically different ways:

Any representation with a propositional form, and in particular any utterance, can be used to represent things in two different ways. It can represent some state of affairs in virtue of its propositional form being true of that state of affairs; in this case we will say that the representation is a description, or it is used descriptively. Or it can represent some other representation which also has a propositional form – a thought, for instance – in virtue of a resemblance between the two propositional forms; in this case we will say the first representation is an interpretation of the second, or that it is used interpretively.

Papafragou (2000: 68) explains that “depending on their semantic content, propositional-attitude and other predicates pick out a specific use of the propositions under their scope”. Consider (51) and (52) below; in the former that-clause has a descriptive use and in the latter it has an interpretive use:

- (51) That the cabinet is corrupt is very sad.
- (52) That the cabinet is corrupt is unfounded. (Papafragou 2000: 68)

These different assumptions are processed and stored in the mind in different ways. Sperber & Wilson (1995: 73) consider the direct descriptions of actual and desirable state of affairs in the external world as “basic factual assumptions” and argue that they are stored in their own “pre-wired” memory stores or domains in the mind directly. On the other hand, the propositions used interpretively are not treated as basic; rather they are treated as second-order representations of representations and are embedded under propositional attitudes. Sperber & Wilson (1995: 74) explain that “the language of thought acts as its own metalanguage” and humans are “capable not only of entertaining assumptions but also of thinking about them and about other representations”.

#### 2.4.2 Propositional domains as modal restrictors

Papafragou (2000: 42) argues that “propositions are organized in domains”. She distinguishes between various propositional domains. On the one hand, she makes a distinction between factual and various non-factual domains. These domains include truth-functional descriptive representations of states of affairs in the actual world (factual domain) or include representations of states of affairs in alternative worlds (non-factual domains); the latter are in fact “representations of alternative realities or possibilities” which provide “a different picture of what the *actual* world could be (become/have been) if a set of conditions (e.g. moral rules, obligations, [desires, ideals, norms or stereotypes] etc. had been met” (p. 66). Factual and alternative domains are in fact examples of what relevance theory calls the *descriptive* use of propositions. On the other hand, Papafragou (2000: 42) recognizes as a separate domain the type of domain which entertains and stores

“propositions as abstract representations (i.e. hypotheses) or abstract representations of representations (where the initial representation may or may not be attributed to some source)”. These are examples of what relevance theory calls the *interpretive* use of propositions. Each of these types of domain will be dealt with in more details below.

#### 2.4.2.1 Factual and non-factual domains

As was mentioned before, factual/non-factual domains contain truth-conditional descriptions of state of affairs in external worlds. These domains are in fact a case of the descriptive use of propositions as developed in relevance theory. What is called the *factual domain* is more precisely “a truth-functional representation of state of affairs in the actual world”; this domain is “the means whereby we represent reality to ourselves [...], and it forms] the default (or base) type of assumption for the purposes of communication [...] against which ostensive stimuli are processed” (p. 41). In this domain some factual assumptions are descriptions of “wide-ranging, empirical generalizations about classes of objects and events [... while others are] specific factual propositions concerning instances of events or particular individuals at given temporal and spatial locations” (p. 41). The *regulatory domains* include “more constrained systems of laws, regulations or rules” such as the legal, social and religious rules or the rules of chess, laws of biology or chemistry, etc. Similar to these are the *normative or stereotypical domains* which store representations of norms or state of affairs in stereotypical worlds; this type of domain “relies quite heavily on the sort of structured knowledge humans typically possess about the normal course of events which has been referred to by various writers in cognitive psychology as ‘scripts’, ‘frames’, ‘scenarios’, and so on” (p. 62). In other words, the normative domains are “those by which we regulate reality” (Traugott 2003: 662) to ourselves. The representations of state of affairs in ideal worlds form the *ideal domains*; it includes representations of morally recommended state of affairs. *Desirability domains* include “descriptions of states of affairs in worlds desirable from someone or other’s point of view (Papafragou 2000: 42).

On Papafragou’s (1998, 2000) model, root modal interpretations involve propositional forms used descriptively: the complement of the verb or the proposition embedded under the modal in the root interpretation of the verbs are used as “a truth-conditional description of a state of affairs in the external world” (p. 70). To put it differently, in root modal interpretations “the modality operates over propositions handled as truth-conditional descriptions of state of affairs (in the actual, or in an alternative – ideal, stereotypical, etc. – world” (p. 70). As will be discussed in the next section this is in sharp contrast to what epistemic operators do.

#### 2.4.2.2 Metarepresentation hypothesis

As was explained before, second-order propositional representations of other conceptual representations come out as a separate propositional domain. These are in fact a case of what relevance theory calls the interpretative use of propositions. As humans we are capable of thinking about our mental contents and distinguishing between our 'basic' and 'second-order' propositional representations and the interpretive use of propositions (e.g. metarepresentations) relies on just this human ability, i.e. the "ability to entertain and manipulate second-order representation in the language of thought" (Papafragou 2000: 69). Papafragou (2000: 69) distinguishes between three separate specialized systems of metarepresentation or three separate sub-types of interpretive use: the *metacommunicative* system deals with "representations of utterances, i.e. linguistically communicated propositional forms, originally produced by the speaker (or another source) at a different time"; the *metalogical* system is concerned with "checking representations for logical consistency, detecting contradictions, and (in more advanced forms) judging a line of argument as valid or undecidable, ..."; the *metacognitive* system deals with "representations of mental states, such as beliefs and desires, and with the human capacity for reflecting on mental states, either one's own or the projected mental states of someone else".

On Papafragou's model epistemic modal interpretations involve propositional forms used interpretively or more specifically, propositional forms used metacognitively: the complement of the verb or the proposition embedded under the modal in the epistemic interpretations of the modals are used as "a representation of an abstract hypothesis, which is considered to be compatible with/entailed by the speaker's set of beliefs" (p. 70). To put it differently, "epistemic operators take scope over propositions which are entertained and manipulated *qua* propositions by the speaker" (p. 70). "The proposal to treat modal verbs in their epistemic interpretations as metarepresentational operators" (p. 205) is called the *metarepresentation hypothesis* by Papafragou (2000) and she considers this to be the core of her proposal.

In the following section the semantics of modals as proposed by Papafragou (1998, 2000) will be offered.

#### 2.4.3 Papafragou's semantic model

Papafragou (2000: 84) assigns the following unitary meanings to a sample of the English modals:

|                  |   |                    |               |
|------------------|---|--------------------|---------------|
| <b>Can:</b>      | p | is compatible with | D factual     |
| <b>May:</b>      | p | is compatible with | D unspecified |
| <b>Must:</b>     | p | is entailed by     | D unspecified |
| <b>Should:</b>   | p | is entailed by     | D normative   |
| <b>Ought to:</b> | p | is entailed by     | D ideal       |

Papafragou assigns different types of semantic underdeterminacy to modals: on the one hand, she analyzes *can*, *should* and *ought to* as cases of semantically complete, albeit vague, lexical items which may undergo free pragmatic enrichment to yield the specific interpretations modal verbs receive in context as well as the truth-evaluable representation expressed by the modal utterance. In fact, the semantic representations of these verbs are complete, but they may only need to be enriched by narrowing down their semantically specified restrictors contextually. On the other hand, *must* and *may* are analyzed as cases of semantically incomplete lexical items as they contain a gap or slot in their semantic content; they are unspecified with respect to the type of domain they admit in context. This gap needs to be filled in or completed contextually; these verbs are dependent on on-line processes of pragmatic saturation to yield truth-evaluable propositions of modal utterances. In the next section it will be demonstrated how the proposed semantics, the metarepresentation hypothesis and pragmatic (relevance-theoretic) considerations interact to give rise to different modal concepts in different contexts.

#### 2.4.4 Pragmatics of root and epistemic modalities

The pragmatics of modality is basically concerned with the recovery of specific modal restrictors in specific contexts in order to enrich or complete the vague or incomplete semantic content of the modal verbs and develop the logical form underlying modal utterances into complete propositional representations. It is the principle of relevance which guides and controls the search for the domain which the speaker could have intended to be optimally relevant for the addressee.

To recover the intended modal restrictor (i.e. the set of background assumptions against which the modal interpretations can be understood) the hearer has to rely on “assumptions which are easily accessible from the encyclopedic entries of the concepts in the complement propositions and other assumptions which are contextually available” (Papafragou 2000: 49). In accordance with the principle of relevance “the intended (sub)domain for the comprehension of a modal has to contribute to an interpretation of the utterance which is accessible enough for the hearer, and capable of achieving adequate cognitive effects in a way compatible with the speaker’s abilities and preferences (i.e. an optimally relevant interpretation)” (p. 49). In two separate sub-sections the pragmatics of root and

epistemic modalities will be illustrated using concrete examples taken from Papafragou (1998, 2000).

#### 2.4.4.1 Pragmatics of root modality

It was explained that root modal interpretations on Papafragou's model involve the descriptive use of propositions. In different terms, root modal operators take scope over propositional forms used descriptively and convey that they are compatible with/entailed by the sets of assumptions in various semantically and/or pragmatically (relevance-theoretically) recoverable factual/non-factual domains. In the different modal utterances exemplified below it will be shown how the semantic inputs of different English modal verbs are pragmatically processed, i.e. enriched or completed, to yield the variety of the root interpretations that these verbs receive in different contexts.

Based on the vague semantics assigned to **CAN**, a (sub)domain of factual assumptions available in the context is involved in the interpretations of this verb in different contexts and *can* basically conveys that the embedded proposition is compatible with the set of propositions in that (sub)domain. Consider (53) below which corresponds to the logical form given as (53'):

- (53) Computer-aided instruction can co-occur with more traditional methods of teaching.
- (53')  $p[\text{Computer-aided instruction co-occurs with more traditional methods of teaching}]$  is compatible with D factual. (Papafragou, 2000: 48)

Imagine that (53) is produced in a context in which the interlocutors are discussing the changes brought about in society due to technological advances. The intended domain for understanding the meaning of *can* in this utterance is the domain of factual assumptions concerning technological advances and *can* in this context conveys that the proposition  $p[\text{Computer-aided instruction co-occurs with more traditional methods of teaching}]$  is compatible with the state of affairs in the actual world brought about by technological advances; "in view of the role of technology in changing societies, computer-aided instruction can co-occur with more traditional methods of teaching". If the interlocutors were rather discussing the views of teachers about the co-occurrence of traditional and modern methods of teaching, the intended factual sub-domain would contain assumptions concerning the views of teachers and (53) could be paraphrased as (54) below:

- (54) In view of the teachers' encouraging stance, computer-aided instruction can co-occur with more traditional methods of teaching. (p.48)

Example (55) demonstrates the "*ability*" interpretation of *can*:

- (55) Mary can speak German. (Papafragou, 2000: 53)

Papafragou (2000: 53) suggests that “ability interpretations for *can* arise whenever the sub-domain of factual assumptions which is taken to be compatible with the embedded proposition belongs to the ‘file’ for an individual or object”. Thus, in the case of (55) above the hearer will activate assumptions included in the encyclopedic entry for Mary (i.e. the sub-domain of factual assumptions which includes Mary’s properties) and the utterance actually conveys the information that the proposition p[Mary speaks German] which involves a new attribute of Mary is compatible with her other features.

Now take (56), (57) and (58) below which express “*suggestion*” or “*offer*” readings of *can*:

- (56) We can meet one day after work. (p. 54)  
(57) I can give you a lift. (p. 54)  
(58) I can carry your suitcase. (p. 58)

According to Papafragou (2000: 54) this type of interpretation occurs in contexts in which the following background assumptions are mutually manifest to the interlocutors: “(i) the embedded proposition p represents a state of affairs which is manifestly desirable to the hearer from his point of view as well as beneficial to him; (ii) the speaker has the responsibility for bringing about the state of affairs described in p; (iii) the speaker manifestly lacks any obligation to bring about this state of affairs”. Here *can* conveys that the state of affairs expressed by p is compatible with the set of assumptions concerning the speaker’s sub-set of desires.

The *deontic* (permission) readings of *can/may* arise in contexts in which the following contextual assumptions are present: “(i) the proposition p expressed by the embedded clause describes a state of affairs that is desirable from the hearer’s point of view; (ii) it is within the hearer’s power to bring about this state of affairs; (iii) the speaker has authority over the hearer” (Papafragou, 2000: 54). In (59) and (60) below *can/may* express permission:

- (59) You can smoke in here.  
(60) You may smoke in here. (p. 58)

The incomplete semantic representation of **MAY** is unspecified with respect to the type of propositional domain this modal verb admits in context. As Papafragou (2000: 41) notes the semantic representations of *may* and *must* “remain silent as to the admissible restrictor, thereby leaving their specification entirely up to pragmatic processing”. Imagine that in a bank, a young customer asks the bank

employee to convert his bank account into a student account and the employee gives the following response:

- (61) Our branch may convert your account into a student account; you just need to supply us with proof of student status. (p. 55)

The logical form of (61) is given as (61') below:

- (61')  $p[\text{Our branch converts your account into a student account}]$  is compatible with D unspecified. (p. 55)

In this context the customer's query about a change in the status of his account has made it mutually manifest that this change is desirable from his point of view and that the change is compatible with the student's preferences. "The only accessible domain of assumptions for which it would be relevant to know whether it is compatible with  $p$  involves the bank regulations" (p. 55), i.e. a factual domain. Thus, (61) can be paraphrased as (62) below:

- (62) In view of the bank regulations, our branch may convert your account into a student account.

**MUST** like *may* has an incomplete semantic content as it is unspecified with respect to the type of restrictor it admits in context. Suppose that the following sentence is uttered by Mary when she finds herself in a very cold room:

- (63) I must sneeze. (p. 59)

The logical form of (63) based on the proposed semantics for this verb is (63') below:

- (63')  $p[\text{Mary sneezes}]$  is entailed by D unspecified. (p. 59)

In this context a sub-set of factual propositions functions as the restrictor of *must* which includes the factual assumptions concerning Mary's physical conditions and circumstances.

Imagine that Amy wants to become attractive and thinks the only way to achieve this is by losing weight. She then utters (64):

- (64) I must lose weight. (p. 60)

Here losing weight is necessary in view of Amy's desire to become attractive; the type of domain which would be retrieved for understanding modality in this



context is the domain of Amy's desires. The *deontic* (i.e. purely obligation-imposing domain) reading of *must* is exemplified by the following utterances:

- (65) You must write 100 times 'I will never yawn in class again'.
- (66) You must love your fellow humans. (p. 61)

According to Papafragou (2000: 61), deontic readings arise in contexts in which the following assumptions are present: "(i) the modal restrictor contains a set consisting of the speaker's desires and factual assumptions; (ii) the speaker has authority over the hearer; (iii) the hearer is in a position to bring about the state of affairs described in the embedded proposition". Thus, the deontic utterances by *must* communicate that the proposition is entailed by a set of factual assumptions consisting the speaker's desires or set of regulatory propositions.

Sentences (67), (68) and (69) below indicate the "*quasi-imperative suggestions/offers*" by *must*:

- (67) We must go for a walk.
- (68) I absolutely must walk home with you.
- (69) You must come and visit us some time. (p. 61)

Such readings arise in contexts in which the following assumptions are mutually manifest: "(i) the embedded proposition *p* represents a state of affairs which is manifestly desirable to the hearer from his point of view as well as beneficial to him; (ii) the speaker has the responsibility for bringing about the state of affairs described in *p*; (iii) the speaker manifestly lacks any obligation to bring about this state of affairs" (Papafragou 2000: 54). In such contexts *must* basically conveys that bringing about the state of affairs described by *p* "is entailed by the appropriate sub-set of the speaker's desires" (p. 62).

**SHOULD** encodes a complete but vague semantic representation; it expresses necessity relative to the propositions concerning the existing stereotypes and norms or the normative domains. Imagine that the sentence given as (70) below is exchanged between two people (e.g. two university students or two friends) who live in or share the same flat. One of these people does not help with cleaning that place, leaving it all to be done by the other. According to what is the normal or the right course of events, two people who live in the same place are equally responsible for keeping it. Given the type of modal restrictor that *should* semantically encodes, i.e. the normative domain, the speaker of (70) can successfully communicate this idea using this sentence:

- (70) You should clean the place once in a while.
- (70') *p*[You clean the place once in a while] is entailed by *D*normative. (p. 62)

This sentence can be paraphrased as (71) below:

- (71) In view of what is normal/expected about two people who share the same house, you should clean the place once in a while.

The complete but vague semantic content of OUGHT TO expresses necessity relative to the ideal course of events or what is morally recommended. Consider (72) below:

- (72) One ought to respect one's country. (p. 61)

The logical form of this utterance corresponds to (72') below:

- (72')  $p[\text{One respects one's country}]$  is entailed by D ideal. (p. 61)

#### 2.4.4.2 The pragmatics of epistemic modality

It was explained that epistemic modal interpretations on Papafragou's model involve the interpretive use of propositions. In different terms, epistemic modal operators take scope over metarepresentations, which are propositional forms used interpretively, and convey that they are compatible with/entailed by the sets of assumptions in the semantically and/or pragmatically (relevance-theoretically) recoverable epistemic domain of the speaker or the speaker's belief domain. In the different modal utterances exemplified below it will be shown how the semantic inputs of different English modal verbs are pragmatically processed, i.e. enriched or completed, to yield the epistemic interpretations that these verbs receive in different contexts.

Consider **MAY** in (73) below:

- (73) Brian's resignation may prove a big mistake. (Papafragou, 2000: 72)

Here once more the the incomplete semantic content of *may* must appeal to contextual assumptions for completion. In producing the above utterance the context is such that it can give rise to an epistemic interpretation. The speaker of this utterance is not in a position to take into account every factual assumption that could determine the truth of the proposition  $p[\text{Brian's resignation proves a big mistake}]$ . This is because  $p$  involves a future event and "the speaker cannot trust the background assumptions she uses to evaluate  $p$  to accurately and fully match state of affairs in the future" (Papafragou 2000: 72). Thus, in this context (73) corresponds to the logical form given as (73') below (where  $\text{Dbel}$  refers to the set of speakers beliefs):

- (73')  $[p[\text{Brian's resignation proves a big mistake}]]$  is compatible with  $\text{Dbel}$ .

Now consider (74) below in which **MUST** conveys an epistemic meaning:

- (74) Some of the neighbors must have seen the burglars. (p. 27)

The mutually manifest contextual assumptions in the case of (74) above can give rise to an epistemic interpretation. The proposition is actually describing a past situation, an event which either has or has not taken place in the past and therefore it has a determinate truth value at the present but since “the speaker lacks complete knowledge of what happened at the relevant time-slot in the past (i.e. during the burglary)” (p. 72) all she can do is “to reason on the basis of incomplete and partly-supported evidence which she reconstructs from both general-encyclopedic and situation-specific information about burglaries (e.g. that the burglars have used one of the usual methods of getting into the house, that they were exposed at least some of the time, that the neighbors pay some attention to what takes place in nearby properties, etc.)” (p. 72). Thus the logical form of (74) can be given as (74') below:

- (74') [p[Some of the neighbors have seen the burglars]] is entailed by Dbel.

**SHOULD** in its epistemic uses is relativized to the set of the stereotypical beliefs of the speaker. For example, the speaker of (75) below utters this sentence when she has called the plumber and expects him to arrive after some time:

- (75) That should be the plumber. (p. 74)

Here again the speaker is predicting a course of events in the future based on present incomplete knowledge of what is the normal or expected course of events. Similarly epistemic **OUGHT TO** expresses necessity relative to the speaker's set of ideal beliefs as in (76) below:

- (76) This problem ought to be very easy for a mathematical genius like you. (p. 76)

These examples demonstrate that Papafragou's model, as she points out, can account for the categorizable and uncategorizable cases which have been recognized by ambiguity/polysemy approaches in a unified and systematic way and thus does not suffer from the inadequacies of such treatments:

The main original contribution of the study lies with the contention that the metarepresentation hypothesis, together with minimalistic semantic assumptions and independently motivated pragmatic considerations, offers a way of handling a broad and diverse range of previously unrelated and puzzling facts and is therefore preferable over previous accounts of modality. (Papafragou 2000: 8)

The power of this model compared to previous ambiguity/polysemy-based treatments basically lies in its logical and psychological plausibility. In fact this model provides us with a psychologically exact mechanism which can lead us to the pragmatic determination of the exact senses of the modals in particular contexts on the basis of the basic logical sense assigned to each modal verb semantically. Context as “a psychological construct [which] includes a subset of the speaker's assumptions about the world” (Sperber & Wilson 1995: 15) plays a very important role in providing each modal verb with its exact sense. In other words, in contrast to ambiguity/polysemy models which at best provide a (range of) vague sense(s) in terms of a number of defined labels (e.g. deontic possibility or epistemic necessity), on this account we are able to calculate or recover exactly what the verb specifies in terms of the pragmatically available sets and subsets of assumptions in the context of use and the basic meanings predicted by the semantics. Also on this model there is a very clear explanation for the difference between the basic subtypes of modality (epistemic/root – deontic and dynamic) in terms of the two basic uses of propositions, i.e. descriptive and interpretive as introduced by Sperber & Wilson (1995) in relevance theory. What is more, semantic parsimony represents another advantage of this model: why a long list of distinct senses, including the categorizable and uncategorizable uses of the modals should be encoded in the semantic entry of these words while it is completely possible for human mind to determine them exactly during online pragmatic processes in different contexts based a single unitary meaning representing the core concept that underdetermines the different uses. Finally, this model by providing a truly descriptive and explanatory account actually succeeds in accommodating all the categorizable and uncategorizable uses of modals in a unified and systematic way. In short then, logical and psychological plausibility, accuracy, systematicity of characterization and economy are among the most important advantages of this model over ambiguity/polysemy accounts.

### 3. Persian modal verbs: a semantic-pragmatic analysis

In this part the results of the application of Papafragou's (1998, 2000) relevance-theoretic semantic-pragmatic model to Persian modal verbs will be presented and discussed in three parts: first, the semantics of Persian modals will be offered; in the second part, the pragmatics of root modality and in the third part, the pragmatics of epistemic modality will be discussed and exemplified.

#### 3.1 A semantic proposal

Following Papafragou (1998, 2000) a unitary meaning in terms of a logical relation and a domain of propositions is assigned to each Persian modal verb:

|                   |                 |      |                |
|-------------------|-----------------|------|----------------|
| <b>bâyad:</b>     | p is entailed   | by   | D unspecified  |
| <b>mi-šav-ad:</b> | p is compatible | with | D unspecified  |
| <b>be-šav-ad:</b> | p is compatible | with | D desirability |
| <b>mi-šod-Ø:</b>  | p is compatible | with | D unspecified  |
| <b>mi-šod-e:</b>  | p is compatible | with | D unspecified  |
| <b>mi-tavân:</b>  | p is compatible | with | D factual      |
| <b>be-tavân:</b>  | p is compatible | with | D desirability |

On this proposal *bâyad*, *mi-šav-ad*, *mi-šod-Ø* and *mi-šod-e* are considered to encode incomplete semantic representations: they contain in their conceptual entries a gap or slot; they are unspecified with respect to the type of propositional domain they can admit contextually. As a result, like English *must* and *may*, these verbs “require the pragmatic saturation of an unspecified semantics” (Papafragou 2000: 43) to fill in or complete the “empty slot in their lexical semantics” (p. 43) and to yield the specific interpretations of modal verbs in different contexts as well as the truth-evaluable representations expressed by modal utterances. In other words, *bâyad*, *mi-šav-ad*, *mi-šod-Ø* and *mi-šod-e* are analyzed as cases of “domain selection”. On the other hand, *be-šav-ad*, *be-tavân* and *mi-tavân* are considered to encode ‘complete but vague’ semantic contents: they are specified with respect to the type of propositional domains they can accept. As a result, like English *can* and *should*, these verbs “may require contextual enrichment or narrowing down in order to convey a more specific concept” (p. 14) in different contexts. In other words, *be-šav-ad*, *be-tavân* and *mi-tavân* are analyzed as cases of “domain restriction”. In the next section, it will be demonstrated how the proposed semantics, the metarepresentation hypothesis and the pragmatic (relevance-theoretic) considerations will interact to yield the specific modal interpretations in different contexts.

### 3.2 The Pragmatics of root modality

As discussed before, root modalities operate over propositional forms used descriptively: in root modal meanings the proposition embedded under the modal is an instance of the descriptive use of propositions rather than a second-order representation or a metarepresentation. In other words, the proposition in root modal meanings is taken to be a direct description of an actual or alternative (e.g. normative, ideal or desirable) state of affairs in the external world. According to Papafragou, what the root modality actually conveys is that this descriptive propositional form bears a certain logical relation (compatibility/entailment) to the set of propositions in various factual/nonfactual domains. During the comprehension process of root modal meanings the specific background assumptions in different propositional (sub)domains are pragmatically recovered based on the principle of relevance: the recovered modal restrictor “has to contribute to an interpretation of the utterance which is accessible enough for the hearer, and capable of achieving adequate cognitive effects in a way compatible with the speaker’s abilities and preferences (i.e. an optimally relevant interpretation)” (Papafragou, 2000: 49). Below the pragmatics of root modal meanings as expressed by Persian modal verbs will be exemplified and discussed.

#### 3.2.1 Derivation of root interpretations

Based on the proposed semantics for Persian modal verbs, **MITAVÂN**, like *can* in English, encodes a complete semantic content: it only admits factual domains as its restrictor. But it may only be vague semantically and, therefore, it may be dependent on the pragmatic process of free enrichment to contextually narrow down its restrictor “so as to pick out [a more specific] sub-domain of factual assumptions” (Papafragou, 2000: 48).

Consider (77) and its logical form given as (77') below where *mi-tavân* is indicating a dynamic possibility in the existing circumstances:

- (77) *mi-tavân san?at-e naft-e kešvar râ ?erteqâ? baxšid*  
IMPF-CAN.NPS industry-LINK oil-LINK country COMP advancement give.PS  
The oil industry can be improved

- (77')  $p[san?at-e naft-e kešvar\ râ\ ?erteqâ?\ baxšid]$  is compatible with  $D_{\text{factual}}$ .  
 $p[\text{The oil industry be improved}]$  is compatible with  $D_{\text{factual}}$ .

Different sub-domains of factual propositions can be recovered pragmatically as the restrictor of *mi-tavân* in the above utterance in different contexts. For example, if the interlocutors are discussing the prospects and effects of receiving help from

foreign countries and signing contracts with them in the oil sector, (77) will be paraphrased as:

- (78) In view of the effects of foreign assistance on the oil sector, the oil industry can be improved.

If the interlocutors are rather discussing the native scientific and practical capabilities of the country itself and the way it can be used to improve the oil sector, (77) can be paraphrased as (79) or (80) below:

- (79) In view of having an efficient and expert workforce, the oil industry can be improved.  
(80) In view of the recent technological advances in the country, the oil industry can be improved.

It seems that *mi-tavân* cannot be used in genuine subjective *deontic* senses; unlike *mi-šav-ad*, it cannot be used in contexts in which the following assumptions are mutually manifest: “(i) the proposition *p* expressed by the embedded clause describes a state of affairs that is desirable from the hearer’s point of view; (ii) it is within the hearer’s power to bring about this state of affairs; (iii) the speaker has authority over the hearer” (Papafragou 2000: 54). It seems to be reporting external rules and regulations or to be merely expressing a neutral dynamic possibility in the existing circumstances given that it is only used in formal impersonal structures. To use Papafragou’s words, it seems to be activating different factual and regulatory domains rather than the domain of the speaker’s preferences. Consider the following examples:

- (81) *mi-tavân tâ panj ketâb ?az ketâbxâne ?amânat gereft*  
IMPF-CAN.NPS until five books from library borrowing take.PS  
One can borrow up to five books from the library
- (82) *ba?d ?az pardâxt-e maxârej-e bimârestân mi-tavân bimâr râ*  
after from paying-LINK costs-LINK hospital IMPF-CAN.NPS patient  
COMP  
*moraxxas kard*  
discharging do.PS  
After paying the hospital’s costs one can discharge the patient (After paying the hospital’s costs the patient can be discharged)
- (83) *mi-tavân dar makân-hâ-ye ?omumi sigâr kešid*  
IMPF-CAN.NPS in place-PL-LINK public cigarette draw.PS  
One can smoke in public places (smoking is allowed in public places)
- (84) *mi-tavân dar ?arz-e do sâ?at ?in ketâb râ tamâm kard*

IMPF-CAN.NPS in width-LINK two hour this book COMP finishing do.PS  
 This book can be finished within two hours

In (81), (82) and (83), it is a factual regulatory domain (i.e. library rules, hospital rules and social rules respectively) with which the proposition expressed by the modal utterance is considered to be compatible. In (84), external circumstances (the number of pages of the book, the level of difficulty of the book, the reader's ability, etc.) are such that make finishing the book within two hours dynamically possible.

*Mi-tavân* can be seen as expressing "suggestion" where the following assumptions are available to the speaker and hearer: "(i) the embedded proposition p represents a state of affairs which is manifestly desirable to the hearer from his point of view as well as beneficial to him; (ii) the speaker has the responsibility for bringing about the state of affairs described in p; (iii) the speaker manifestly lacks any obligation to bring about this state of affairs" (Papafragou 2000: 54). Suppose that sentence (85) below is uttered by a teacher to the students of a class who were supposed to take an exam on that day but for some reason they have not been able to prepare themselves.

- (85) *mi-tavân ?emtehân râ hafte-ye digar bargozâr kard*  
 IMPF-CAN.NPS exam COMP week-LINK next taking do.PS  
 The exam can be given next week

In this context (i) the proposition p[The exam be given next week] is definitely desirable to the hearers (the students) who are not well-prepared for the exam; (ii) it is the teacher who should bring about this desirable state of affairs, i.e. let the students postpone the exam to the next week; (iii) the teacher does not have to let the students postpone the exam. Similarly in (86) below in the presence of the above mentioned assumptions which are necessary for suggestion readings, *mi-tavân* can be seen as expressing the speaker's suggestion about taking a trip to north during the new year holidays:

- (86) *mi-tavân barâ-y-e tatil-ât-e noruz be šomâl safar kard*  
 IMPF-CAN.NPS for-LINK holiday-PL-LINK Noruz to north travel do.PS  
 We can travel to north for Noruz holidays

The modal verb **MIŠAVAD** has both root and epistemic uses because both descriptive and interpretive propositions (metarepresentations) can be embedded under this modal verb. Therefore it will be analyzed as an incomplete lexical item, with a gap in its semantic representation concerning the type of modal restrictor or propositional domain it admits in different contexts. In other words, like the English *may*, the semantic representation of this verb "remain[s] silent as to the



type of the admissible restrictor [i.e. factual/nonfactual or epistemic], thereby leaving its specification entirely up to pragmatic processing” (Papafragou 2000: 41). Consider example (87) and its logical form (87') and the way it pragmatically takes its restrictor from the context:

- (87) *tanhâ mi-šav-ad yek nafar râ bâ xod be marâsem-e*  
only IMPF-MAY.NPS-3SG one person COMP with self to ceremony-LINK  
*dâneš?âmuxtegi bi-âvar-id*  
graduation NIN-bring.NPS-2PL  
You may bring only one person with you to the graduation ceremony
- (87')  $p[\text{tanhâ yek nafar râ bâ xod be marâsem-e dâneš?âmuxtegi bi-âvar-id}]$  is compatible with  $D_{\text{unspecified}}$ .  
 $p[\text{You bring only one person with you to the graduation ceremony}]$  is compatible with  $D_{\text{unspecified}}$ .

Imagine that the above utterance is a response from a person in charge of the graduation ceremony to a group of students who like all their family members to attend their graduation ceremony and ask whether this is possible. In this context, the only relevant domain of propositions for which it is necessary to know whether it is compatible with the wish of the students is the domain of the rules of the university. The speaker of the above utterance has this domain in mind and tries to convince the students that they cannot bring all their family members to the ceremony because it is against the rules. Thus, it is a sub-domain of factual assumptions or a regulatory domain that is recovered in the context of the above utterance as the restrictor of the modal verb. Therefore the above utterance can be paraphrased as (88) below:

- (88) In view of the university rules, you may bring only one person with you to the graduation ceremony.

*Mi-šav-ad* can be used deontically to give permission. Imagine that the following sentence is uttered by a little girl to another one who has forgotten to bring her color-pencils with her to the class:

- (89) *mi-šav-ad ?az medâd rangi-hâ-ye man ?estefâdeh Ø-kon-i*  
IMPF-MAY.NPS-3SG from pencil colorful-PL-LINK I using NIN-do.NPS-2SG  
You may use my color-pencils

In the above context, the necessary background assumptions for the occurrence of deontic readings are manifestly present which as Papafragou (2000: 54) says, are:  
(i) “the proposition  $p$  expressed by the embedded clause describes a state of affairs

that is desirable from the hearer's point of view" (the hearer likes to use her friend's color-pencils); (ii) "it is within the hearer's power to bring about this state of affairs" (the speaker is able to give her color-pencils to her friend); (iii) "the speaker has authority over the hearer" (the speaker is the owner of the color-pencils). Here *mi-šav-ad* shows a compatibility relation between the proposition p[You use my color-pencils] and a set of factual assumptions, including the speaker's preferences. Consider the oddity of *mi-tavân* in such contexts:

- (90) *mi-tavân ?az medâd rangi-hâ-ye man ?estefâde kard*  
 IMPF-CAN.NPS from pencil color-PL-LINK I using do.PS  
 One can use my color-pencils (My color-pencils can be used)

*Mi-tavân* in the above utterance is more probably expressing a circumstantial neutral possibility and/or a formally stated offer or suggestion rather than giving permission to one particular individual to use one's color pencils. Persian speakers rarely, if ever, give permission to other people to use their personal belongings using *mi-tavân*. When the necessary background assumption for deontic readings mentioned above are present, *mi-šav-ad* is generally used. The subjective deontic use of this verb is enhanced by the personal inflected structure in which *mi-šav-ad* can occur while *mi-tavân* can only be used in impersonal structures (structures in which the main verb has not been inflected for person and number, rather the main verb is in the form of a short infinitive) and formal contexts. Consider (91) as another example:

- (91) *mi-šav-ad mâšin-e man râ be-bar-i*  
 IMPF-MAY.NPS-3SG car-LINK I COMP NIN-take.NPS-2SG  
 You may take my car (You may drive my car)

But *mi-šav-ad* can also be used in impersonal structures:

- (92) *mi-šav-ad ?az medâd rangi-hâ-ye man ?estefâde kard*  
 IMPF-MAY.NPS-3SG from pencil color-PL-LINK I using do.PS  
 One can use my color-pencils (My color-pencils can be used)
- (93) *mi-šav-ad mâšin-e man râ bord*  
 IMPF-MAY.NPS-3SG car-LINK I COMP take-PS  
 One can take my car (My car can be taken)

Here again it seems that the genuine deontic reading is obscured to some extent due to the impersonal structure and the modal can be seen as expressing an offer and/or a neutral circumstantial possibility depending on the context. It might be said that the personal involvement necessary for subjective deontic readings is decreased if the modal is used with impersonal structures as in (92) and (93) above.

*Mi-šav-ad* can also indicate what is dynamically possible in the external circumstances:

- (94) *mi-šav-ad tavarrom râ mahâr kard*  
IMPF-MAY.NPS-3SG inflation COMP curbing do.PS  
Inflation can be checked (curbed)

Imagine that (94) above is uttered by the minister of economy or by an economist about the economical situation of a country. Here a sub-domain of factual economical propositions concerning the economical situation of the country (e.g. the healthy cash flow that exists in the country) is recovered based on which the proposition  $p$ [Inflation be checked] is considered as compatible. It can be paraphrased as (95) below:

- (95) In view of the present economic situation of the country inflation can be checked.

As suggested above, *mi-šav-ad* can express “suggestion” or “offer”. In this usage it is very similar to *mi-tav-ân* but in contrast to this verb, it is informal especially when used with personal or inflected structures:

- (96) *mi-šav-ad ?emtehân râ hafte-ye digar bargozâr kard*  
IMPF-MAY.NPS-3SG exam COMP week-LINK next taking do.PS  
The exam can be given next week

- (97) *mi-šav-ad barây-e tatil-ât-e noruz be šomâl be-rav-im*

The modal verb **MIŠOD** has both root and epistemic uses as both descriptive and interpretive propositions (metarepresentations) can be embedded under this modal verb. So it will be analyzed as an incomplete lexical item, with a gap in its semantic representation concerning the type of modal restrictor or propositional domain it admits in different contexts. To put it differently, like the English *may*, the semantic representation of this verb “remain[s] silent as to the type of the admissible restrictor [i.e. factual/nonfactual or epistemic], thereby leaving its specification entirely up to pragmatic processing” (Papafragou 2000: 41). In the following example, which represents a root example, this verb admits the domain of factual assumptions as its restrictor. Consider (98) as an utterance exchanged between two students who have just finished taking a test and are talking about it:

- (98) *mi-šod-Ø xeili râhat taqallob kard*  
IMPF-MAY.PS-3SG very easily cheating do.PS  
One could easily cheat (It was perfectly possible to cheat)

This utterance should be rewritten as the following logical form:

- (98') p[*xeili rāhat taqallob kard*] is compatible with D<sub>unspecified</sub>.  
p[one easily cheated] is compatible with D<sub>unspecified</sub>.

In this utterance, *mi-šod-Ø* is used to express a dynamic possibility in the past and it can be paraphrased as (99) below:

- (99) In view of the situation in the exam room, it was perfectly possible to cheat.

Example (100) below indicates the *deontic* use of *mi-šod-Ø*. Here Mona, who the owner of the car, is saying to her friend, Sara, who doesn't have a car, that she was allowed to use her car, while she was on trip. But the sentence is unreal and the implication that the possibility was not realized is obvious:

- (100) *vaqti ?injā na-bud-am mi-šod-Ø ?az māšin-am ?estefāde Ø-kon-i*  
when here NEG-be.PS-1SG IMPF-MAY.PS-3SG from car-I using NIN-  
do.NPS-2SG  
You were allowed to use my car, while I was not here

The speaker of (100) above succeeds in conveying that Sara was permitted to use her car, while she was on trip in the presence of the following background assumptions necessary for deontic readings: (i) "the proposition p expressed by the embedded clause describes a state of affairs that is desirable from the hearer's point of view" (Sara doesn't have a car, and it was desirable for her to use Mona's car while she was on trip); (ii) "it is within the hearer's power to bring about this state of affairs" (Sara knows how to drive); (iii) "the speaker has authority over the hearer" (Mona is the owner of the car). Here *mi-šod-Ø* shows a compatibility relation between p[You used my car while I was on trip] and the domain of the speaker's preferences.

**MI-ŠOD-E**, which is rarely used in Persian language, is unspecified with respect to the type of propositional domains it can accept contextually, as both descriptive representations and metarepresentations can be embedded under this modal verb. Below in its root use, it expresses a factual possibility in the past, not very unlike *mi-šod-Ø* as in (98):

- (101) *mi-šod-e (?ast) so?ālāt-e ?emtehān rā qabl ?az bargozāri xarid*  
IMPF-MAY.PS-PTP (PERF.NPS-3SG) questions-LINK exam COMP before  
from administration buy.PS  
The exam questions could have been bought before administration

This sentence will therefore be rewritten as the following logical form:

- (101')  $p[so?âlât-e \text{ ?emtehân râ qabl \text{ ?az bargozâri xarid}]$  is compatible with  $D_{unspecified}$ .  
 $p[\text{The exam questions have been bought before administration}]$  is compatible with  $D_{unspecified}$ .

**BÂYAD** is unspecified with respect to the type of propositional domain it can accept in different contexts as this verb can be used both as a root and as an epistemic operator, and therefore both descriptive and interpretive propositions can be embedded under this modal verb in different contexts. To use Papafragou's (2000: 41) words, the semantic representation of this verb "remain[s] silent as to the type of the admissible restrictor [i.e. factual/nonfactual or epistemic], thereby leaving its specification entirely up to pragmatic processing". Consider *bâyad* in the following root example:

- (102) *bâyad dar masraf-e ?âb sarfe juee Ø-kon-im*  
 MUST in consumption-LINK water economizing NIN-do.NPS-1PL  
 We must economize on water

The logical form of this utterance will therefore be given as (102') below:

- (102')  $p[dar masraf-e \text{ ?âb sarfe juee kon-im}]$  is entailed by  $D_{unspecified}$ .  
 $p[\text{We economize on water}]$  is entailed by  $D_{unspecified}$ .

In this utterance *bâyad* can convey different modalities depending on the different contexts in which it is used. For example, imagine that the above sentence is uttered by a local governor to the people of a region which has received little rain during the previous year. Here this modal verb expresses a circumstantial or dynamic necessity arisen by the poor rainfall in that region and its consequences. In this case (102) can be paraphrased as (103) below:

- (103) In view of the danger of rationing of water, we must economize on water.

Now suppose that in a different context (102) is uttered by a father addressing his family after checking the water bill. In this case the circumstantial necessity has arisen from the economic circumstances of a family. Here (102) should be paraphrased as (104) below:

- (104) In view of my limited income, we must economize on water.

In the latter case it is the sub-domain of factual assumptions concerning the economic situation and the limited income of the family that entails the proposition  $p[\text{We economize on water}]$  while in the former the proposition  $p[\text{We economize on}$

water] has been entailed by a sub-domain of factual assumptions concerning the effects of the poor rainfall in a region.

Now take the following sentences in which *bâyad* expresses an entailment relationship with respect to different regulatory domains (i.e. rules of a scientific test and rules of a match, respectively):

- (105) *dar ?in ?âzmâyeš bâyard hame-ye botri-hâ daqiqan be yek šekl Ø-bâš-and*  
 in this test MUST all-LINK bottle-PL exactly to one shape NIN-be.NPS-3PL  
 In this test all the bottles must have the same shape
- (106) *dar ?in mosâbeqe šerkatkonande-gân bâyard tedâd-i sekke râ bâ dandân*  
 in this match participant-PL MUST number-INDEF coin COMP with tooth  
*?az darun-e yek bošqâb-e por ?az ?ârd xârej Ø-kon-and*  
 from inside-LINK one plate-LINK full from flour out NIN-do.NPS-3PL  
 In this match the participants must take out a number of coins from a plate full of flour only by using their teeth

Imagine that Mona desires to become a good writer. She finds out that the only way to achieve this is by reading more and more books. She then utters (107):

- (107) *bâyad har čeqadr mi-tavân-am ketâb be-xân-am*  
 MUST every much IMPF-can.NPS-1SG book NIN-read.NPS-1SG  
 I must read books as much as I can

In this utterance the proposition p[I read books as much as I can] is only necessary in view of Mona's desire to become a good writer. Therefore, the type of domain involved in the comprehension of modality in this utterance is the domain of Mona's desires. Thus, (107) corresponds to the following logical form:

- (107') p[Mona har čeqadr mi-tavân-ad ketâb be-xân-ad] is entailed by D<sub>des</sub>.  
 p[Mona reads books as much as she can] is entailed by D<sub>des</sub>.

Now consider the “deontic (obligation-imposing)” uses of *bâyad* in the following sentences:

- (108) *bâyad taslim be-šav-i vagarna košt-e mi-šav-i*  
 MUST surrendered NIN-be.NPS-2SG otherwise kill.PS-PTP IMPF-PASS.NPS-2SG  
 You must surrender or you'll be killed
- (109) *bâyad be moqe be kelâs bi-âi-i*  
 MUST to time to class NIN-come.NPS-2SG  
 You must come to class on time

- (110) *bâyad dar ?in moddat ?az xord-an-e gušt parhiz Ø-kon-ad*  
SHOULD in this period from eat.PS-INV-LINK meat avoiding NIN-do.NPS-3SG  
During this period he should avoid eating meat
- (111) *bâyad xod-at râ bâ šarâyet-e jadid sâzegâr Ø-kon-i*  
SHOULD self-you COMP with circumstances-LINK new adapting NIN-do.NPS-2SG  
You should adapt yourself to new circumstances
- (112) *bâyad ?az kerem-e zedd-e ?âfiâb ?estefâde Ø-kon-i*  
SHOULD from cream-LINK anti-LINK sunshine using NIN-do.NPS-2SG  
You should use sunblock
- (113) *bâyad be vâledein-at ?ehterâm be-gozâr-i*  
ought to to parents-you respect NIN-put.NPS-2SG  
You ought to respect your parents

As the above examples demonstrate and Rahimian (1995: 97) observes, “BÂYAD covers a wider range of meaning than the English *must*. It covers the area covered by *must*, *should*, *ought*, *have*, and even some uses of *will*”. Like the English *must*, when the obligation-imposing or the strong deontic readings of *bâyad* arise, the following assumptions are mutually manifest to the interlocutors in the context: “(i) the modal restrictor contains a set consisting of the speaker’s desires and factual assumptions; (ii) the speaker has authority over the hearer; (iii) the hearer is in a position to bring about the state of affairs described in the embedded proposition” (Papafragou, 2000: 61). This strong obligation-imposing sense is conveyed by (108) and (109) above: imagine that (108) is uttered in a fight or war by the stronger side to the weaker side. The deontic background assumptions are mutually manifest to the interlocutors in this context: (i) the speaker definitely considers the hearer’s surrender and acceptance of defeat as desirable for his purposes; (ii) the speaker is definitely more powerful than the hearer and he can kill the hearer if he wants; (iii) the hearer is able to surrender to save his life. Similarly imagine that (109) is uttered by a teacher to her late-coming student. Definitely the teacher is in a position to make her student be on time. In these sentences the modal *bâyad* communicates that the propositions p[You surrender] and p[You be on time] are entailed by the set of factual assumptions consisting of the speaker’s desires or set of regulatory propositions.

In (110) – (112) the modal *bâyad* expresses necessity with respect to the normative or stereotypical domain: it actually conveys that bringing about the state of affairs described by the proposition is entailed by the normative or right course of events. Finally, in (113) the modal utterance expresses a morally recommended state of affair entailed by the ideal domain.

As another deontic reading consider the expression of past obligation or deontic necessity in the following sentences. Take that (114) is uttered by a master to his servant at the end of a day and (115) is said by a teacher to the students of a class:

- (114) *bâyad ?emruz hame-ye xâne râ tamiz mi-kard-i*  
 MUST today all-LINK house COMP cleaning IMPF-do.PS-2SG  
 You were required to clean the whole house today
- (115) *?in takâlîf râ bâyard dar xâne ?anjâm mi-dâd-id*  
 this home works COMP MUST at home doing IMPF-do.PS-2PL  
 You were required to do these home works at home

In the above contexts in the presence of the assumptions necessary for deontic readings, including “(i) the modal restrictor contains a set consisting of the speaker’s desires and factual [regulatory] assumptions; (ii) the speaker has authority over the hearer; (iii) the hearer is in a position to bring about the state of affairs described in the embedded proposition” (Papafragou 2000: 61), *bâyad* can express what was deontically necessary to be done in the past. In these utterances the propositions p[You cleaned the whole house today] and p[You did these home works at home] are entailed by the domain of the speaker’s preferences or set of regulatory assumptions.

Sentences (116) and (117) below indicate “*quasi-imperative suggestions/offers*” with *bâyad*:

- (116) *bâyad bištar piš-e mâ be-mân-i*  
 MUST more with-LINK we NIN-stay.NPS-2SG  
 You must stay with us more
- (117) *bâyad nâhâr râ bâ mâ be-xor-i*  
 MUST lunch COMP with us NIN-eat.NPS-2SG  
 You must have lunch with us

Such readings arise in contexts in which the following assumptions are manifestly present: “(i) the embedded proposition p represents a state of affairs which is manifestly desirable to the hearer from his point of view as well as beneficial to him; (ii) the speaker has the responsibility for bringing about the state of affairs described in p; (iii) the speaker manifestly lacks any obligation to bring about this state of affairs” (Papafragou 2000: 54). In such contexts *bâyad* basically conveys that bringing about the state of affairs described by p “is entailed by the appropriate sub-set of the speaker’s desires” (Papafragou, 2000: 62).

The complete semantic content of **BEŠAVAD** admits the domain of the desires and wishes of the speaker as its restrictor. In other words, the proposition embedded under this modal always represents a state of affairs that is desirable to



the speaker; it is something that the speaker would like to be realized. For example, to a student a proposition like *p*[I pass this difficult physics course] is normally desirable while the opposite of this proposition, i.e. *p*[I fail this difficult physics course], is normally undesirable. Similarly a person who suffers from some disease considers a proposition like *p*[I be cured with this new medical treatment] as desirable and considers a proposition like *p*[I get worse with this new medical treatment] as undesirable. Examples (118) and (120) below demonstrate that the embedding of the desirable propositions under *be-šav-ad* will result in semantically acceptable sentences while, examples (119) and (121) indicate that the embedding of undesirable propositions leads to semantically odd sentences:

- (118) *barâye ?inke be-šav-ad ?in vâhed-e saxt-e fizik râ pâs be-kon-am, ...*  
for this NIN-MAY.NPS-3SG this course-LINK difficult-LINK physics COMP  
passing NIN-do.NPS-1SG ...  
In order for me to be able to pass this difficult physics course, ...
- (119) *\*barâye ?inke be-šav-ad ?in vâhed-e saxt-e fizik râ bi-oft-am, ...*  
for this NIN-MAY.NPS-3SG this course-LINK difficult-LINK physics COMP  
NIN-fail.NPS-1SG ...  
In order for me to be able to fail this difficult physics course, ...
- (120) *šâyad be-šav-ad bâ ?in darmân-e jadid*  
perhaps NIN-MAY.NPS-3SG with this treatment-LINK new  
*bimâri-am râ mo?âleje be-kon-am*  
disease-I COMP curing NIN-do.NPS-1SG  
I may be able to cure my disease with this new medical treatment
- (121) *\*šâyad be-šav-ad bâ ?in darmân-e jadid bimâri-am bad-tar be-šav-ad*  
perhaps NIN-MAY.NPS-3SG with this treatment-LINK new disease-I bad-  
COMPVE NIN-be.NPS-1SG  
I may be able to get worse with this new medical treatment

Based on these examples, it can be argued that it is the semantically specified modal restrictor of *be-šav-ad*, i.e. the domain of the speaker's desires, which makes it impossible for undesirable propositions to get embedded under this modal verb in the semantically odd sentences presented above. Thus, the logical form underlying the following sentence with *be-šav-ad* will correspond to (122'):

- (122) *bâ komak-e pedar-am šâyad be-šav-ad ?in xâne râ be-xar-am*  
with help-LINK father-I perhaps NIN-MAY.NPS-3SG this house COMP NIN-  
buy.NPS-1SG  
With my father's help it may be possible for me to buy this house (With my  
father's help I may be able to buy this house)

- (122')  $p[bâ\ komak-e\ pedar-am\ ?in\ xâne\ râ\ be-xar-am]$  is compatible with  $D_{desires}$ .  
 $p[With\ my\ father's\ help\ I\ buy\ this\ house]$  is compatible with  $D_{desires}$ .

The complete semantic representation of **BETAVÂN** admits the domain of desires or wishes as its restrictor and conveys that the proposition expressed is compatible with the set of assumptions in the domain of wishes/desires/plans of the interlocutors. This can justify why (124) and (126) below which include undesirable propositions sound odd while (123) and (125) which include desirable propositions do not:

- (123) *barâye ?inke be-tavân ?in vâhed-e saxe fizik râ pâs kard, ...*  
 for this NIN-CAN.NPS this course-LINK difficult-LINK physics COMP  
 passing do.PS ...  
 In order to be able to pass this difficult physics course, ...
- (124) *\*barâye ?inke be-tavân ?in vâhed-e saxe fizik râ ofîad, ...*  
 for this NIN-CAN.NPS this course-LINK difficult-LINK physics COMP fail.PS  
 In order to be able to fail this difficult physics course, ...
- (125) *šâyad be-tavân ?az ?in bimâri-e košande pišgiri kard*  
 perhaps NIN-CAN.NPS from this disease-LINK deadly prevention do.PS  
 We may be able to prevent this deadly disease
- (126) *\*šâyad be-tavân ?az ?in bimâri-e košande mord*  
 perhaps NIN-CAN.NPS from this disease-LINK deadly die.PS  
 We may be able to die of this deadly disease

Normally a student who has taken a difficult physics course would consider the proposition  $p[I\ pass\ this\ difficult\ physics\ course]$  as desirable and the proposition  $p[I\ fail\ this\ difficult\ physics\ course]$  as undesirable. In (123) above in which the desirable proposition has been embedded under *be-tavân*, the resulting sentence sounds correct. But the embedding of the undesirable proposition under this modal in (124) has resulted in a semantically odd sentence; a student normally does not desire to be able to fail a difficult physics course. Similarly at the time of the breakout of a serious disease that can endanger the lives of many people, the proposition  $p[this\ deadly\ disease\ be\ prevented]$  is desirable and the proposition  $p[to\ die\ of\ this\ deadly\ disease]$  is undesirable. Here again sentence (125) that includes the desirable proposition is acceptable because normally at the time of the breakout of a deadly disease, people desire to be able to prevent it. But (126) which includes the undesirable proposition sounds semantically odd; at the time of the breakout of a deadly disease, people normally do not want to be able to die of the disease. Based on these examples, it can be argued that it is the semantically specified modal restrictor of *be-tavân*, i.e. the domain of the speaker's desires, which makes

it impossible for undesirable propositions to be embedded under this verb in (124) and (126) above. Thus, the logical form underlying (127) below will correspond to (127'):

- (127) *bâ komak-e pedar-am šâyad be-tavân ?in xâne râ xarid*  
with help-LINK father-I perhaps NIN-CAN.NPS this house COMP buy.PS  
With my father's help it may be possible to buy this house
- (127')  $p[bâ\ komak-e\ pedar-am\ šâyad\ ?in\ xâne\ râ\ xarid]$  is compatible with  $D_{desires}$ .  
 $p[With\ my\ father's\ help\ (we)\ buy\ this\ house]$  is compatible with  $D_{desires}$ .

It may be argued that it is the capability or ability domain which is the restrictor of this modal verb especially as this verb has been derived from the verb 'tavânestan' (be able to). But an ability or capability which people lack at present and that they like to develop in the future can be more properly described as their wishes. These undeveloped abilities definitely form an important subset or sub-domain of the propositions included in the domain of the desires and plans though not the only one. Consider (128) below in which *be-tavân* highlights the desire for the ability to play the piano and (129) in which *be-tavân* highlights the desire for getting a permission to meet a boss:

- (128) *barâye ?inke be-tavân be xubi piâno navâxt,*  
for this NIN-CAN.NPS to goodness piano play.PS  
*bâyad panj tâ šeš sâl tamrin kard*  
SHOULD five to six year practice do.PS  
To be able to play the piano well, one should practice five to six years
- (129) *barâye ?inke betavân bâ re?is didâr kard bâjad vaqt-e qabli dâšt*  
for this NIN-CAN.NPS with boss meeting do.PS MUST time-LINK previous have.PS  
To be able to meet the boss, you must make an appointment in advance

*Be-šav-ad* and *be-tav-ân* in all the above contexts can replace one another with no significant change in modal meaning except that *be-tav-ân* appears in formal contexts and *be-šav-ad* in informal ones. In fact *be-šav-ad* is frequently used in spoken Persian and has developed a colloquial form, i.e. 'be-še', while *be-tav-ân* requires a very formal context and is therefore almost never used in Persian ordinary speech. This verb has no colloquial form. In the same way *mi-šav-ad* which is frequently used in spoken Persian has a colloquial form, i.e. 'mi-še', but *mi-tavân* which, like *be-tavân*, needs a very formal context has no colloquial form. It must also be noted that *mi-tavân* and *be-tavân* only choose impersonal (uninflected) structures.

In the next section the pragmatics of epistemic modal meanings in Persian will be exemplified and discussed.

### 3.3 The Pragmatics of epistemic modality

According to Papafragou, what the epistemic modalities actually convey is that the metarepresentational propositions are compatible with/entailed by the domain of the speaker's beliefs (Metarepresentation Hypothesis). During the comprehension process of epistemic modal meanings the specific assumptions in the speaker's set of beliefs on which the speaker has built her inferences are pragmatically recovered based on the principle of relevance: the recovered modal restrictor "has to contribute to an interpretation of the utterance which is accessible enough for the hearer, and capable of achieving adequate cognitive effects in a way compatible with the speaker's abilities and preferences (i.e. an optimally relevant interpretation)" (Papafragou 2000: 49). Below the pragmatics of epistemic modal meanings as expressed by Persian modal verbs will be exemplified and discussed.

#### 3.3.1 Derivation of epistemic interpretations

The incomplete semantic representation of **MIŠAVAD** in its epistemic uses accepts the domain of the speaker's beliefs as its restrictor. Consider the epistemic use of this verb in example (130) which represents an inference made by a teacher who has noticed that one of his bad students has gotten a very high grade in a difficult test:

- (130) *mi-šav-ad dar ?in ?emtehân taqallob kard-e bâš-ad*  
IMPF-MAY.NPS-3SG in this test cheating do.PS-PTP NIN-PERF.NPS-3SG  
He may have cheated in this test

The speaker of (130) is not in a position to calculate exactly how her weak student has managed to answer the questions of this test well. As she is not aware of all the factual propositions that can affect the truth of the proposition  $p$ [she has cheated on this test] which refers to a situation in the past, she is forced to make inferences based on her "incomplete and partly-supported evidence" (Papafragou 2000: 72) and information, including what she knows about the educational background of this student (e.g. that this grade is much higher compared to the previous grades of this student on this subject, that this student has a past record on cheating, etc.). Thus, (130) can be rewritten as the following logical form where  $D_{bel}$  refers to the domain of the speaker's beliefs:

- (130') [p[*dar ?in ?emtehânn taqallobn kard-e bâš-ad*]] is compatible with  $D_{bel}$ .  
[p[she has cheated in this test]] is compatible with  $D_{bel}$ .

The incomplete semantic content of **BÂYAD** in the following sentences selects the domain of the speaker's beliefs as its restrictor (adopted from Safavi 2004: 348):

- (131) *?emsâl zemestân bâyard yek barf-e hesâbi bi-âi-ad*  
this year winter MUST one snow-LINK good NIN-come.NPS-3SG  
It must snow heavily this year
- (132) *?al?ân bâyard dar širâz bârân be-bâr-ad*  
now MUST in Shiraz rain NIN-pour.NPS-3SG  
Now it must be raining in Shiraz

In producing the above utterances the context is such that it can give rise to epistemic interpretations: the speakers are not in a position to take into account every factual assumption that can determine the truth of the propositions p[It snows heavily this year] and p[Now it is raining in Shiraz]. In (131) the speaker is predicting a future weather condition and the proposition is describing an inference made by the speaker about the future based on her present incomplete knowledge. Thus (131) corresponds to the following logical form:

- (131') [p[*?emsâl zemestân yek barf-e hesâbi bi-âi-ad*]] is entailed by  $D_{bel}$ .  
[p[It snows heavily this year]] is entailed by  $D_{bel}$ .

Imagine that the speaker of (132) utters this sentence when he is driving towards Shiraz but he has not arrived there yet. On his way to Shiraz, he observes that it is rainy in other towns and cities near this city and, therefore, he is able to make the inference p[Now it is raining in Shiraz] based on his incomplete evidence. Thus (132) can be rewritten as the following logical form:

- (132') [p[*?al?ân dar širâz bârân be-bâr-ad*]] is entailed by  $D_{bel}$ .  
[p[Now it is raining in Shiraz]] is entailed by  $D_{bel}$ .

Epistemic uses with **MIŠOD** are not impossible. Consider example (133) where the speaker (a physician) is making a guess as to why one of her patients died unexpectedly:

- (133) *mi-šod-Ø ?ellat-e margaš xunrizi-e dâxeli bâš-ad*  
IMPF-MAY.PS-3SG cause-LINK death-he bleeding-LINK internal NIN-be.NPS-3SG  
The cause of his death could be internal bleeding

In this context, the physician is not able to state confidently why the patient has died and because she is not at the moment aware of every factual assumption that can determine the truth of the proposition  $p$ [The cause of death was internal bleeding], she is forced to draw an inference based on her previous experiences with unexpected deaths of patients in similar cases. The physician is making a judgment about a past event. The logical form of (133) can then be rewritten as (133'):

- (133')  $[p[?ellat-e margaš xunrizi-e dāxeli bud]]$  is compatible  $D_{bel}$ .  
 $[p[\text{The cause of his death was internal bleeding}]]$  is compatible with  $D_{bel}$ .

Rarely similar situations can be expressed by **MI-ŠOD-E** as shown in (134) below. Semantically (133) and (134) are very similar. Both include present judgments about past events:

- (134) *mi-šod-e (?ast) ke ?ellat-e marg xunrizi-e dāxeli*  
 IMPF-MAY.PS-PTP (PERF.NPS-3SG) that cause-LINK death bleeding-LINK  
 internal be.NPS-3SG  
 The cause of death could have been internal bleeding
- (134')  $[p[?ellat-e marg xunrizi-e dāxeli bud-e ?ast]]$  is compatible  $D_{bel}$ .  
 $[p[\text{The cause of death has been internal bleeding}]]$  is compatible with  $D_{bel}$ .

#### 4. Conclusion

The results of the application of Papafragou's (1998, 2000) semantic-pragmatic model to Persian modal verbs indicate that in Persian five modal verbs, including *mi-šav-ad*, *mi-šod-Ø*, *mi-šod-e*, *be-šav-ad*, *be-tavân* and *mi-tavân* encode the logical relation of compatibility while only one modal verb, i.e. *bâyad*, encodes the logical relation of entailment. Furthermore, these results show that four Persian modal verbs, i.e. *bâyad*, *mi-šav-ad*, *mi-šod-e* and *mi-šod-Ø*, are semantically incomplete; they are unspecified with respect to the type of propositional domain they can admit in context and therefore they are completely dependent on the pragmatic processes of domain selection to fill in the empty slot in their semantic representations. On the other hand, the three other Persian modal verbs, i.e. *be-tavân*, *be-šavad* and *mi-tavân* have complete but vague semantic representations. These verbs are specified with respect to the type of propositional domains they can contextually accept; *be-tavân* and *be-šavad* accept the desirability domain and *mi-tavân* admits the domain of factual assumptions. As a result, these verbs may

only need to undergo the pragmatic processes of free enrichment to narrow down their propositional domains and convey more specific modal concepts.

Some interesting differences between Persian and English modal verbs were also observed: firstly, while English has three modal verbs that encode the logical relation of entailment among which the propositional domains, including the factual/nonfactual domains and the belief domains have been distributed, Persian has only one modal verb encoding this logical relation which is individually capable of accepting the wide range of propositional domains as accepted by the three English modal verbs, i.e. *must*, *should* and *ought to*.

Secondly, in Persian, unlike English, the root concept of “ability” is not expressed by the set of modal verbs: while in English this concept is expressed by the modal verb *can* and conveys a compatibility relation with respect to the propositions in “the ‘file’ for an individual or object” (Papafragou 2000: 53), in Persian the main verb ‘*tavānest-an*’ (be able to), which actually inflects for different persons and numbers, expresses this concept. In a similar vein, the verb *mi-šav-ad*, which can appear in both inflected and uninflected structures, prefers the inflected one with its permission, obligation and suggestion uses which are directly connected with the domains of propositions concerning the individuals’ preferences and desires. Thus it seems that in Persian when the contextual recovery of domains or “files” that contain propositions about individuals or objects is necessary for the occurrence of senses such as “ability”, “permission”, and “obligation” or “suggestion”, the use of personal forms and structures that actually inflect for different persons and numbers is preferred.

Thirdly, while English does not have any modal verb with the desirability domain encoded semantically as its restrictor, Persian has two modal verbs, i.e. *be-šav-ad* and *be-tavān*, which specifically encode this domain and are mainly confined to informal and formal contexts respectively.

Fourthly, it was observed that the past forms of the deontic modal verbs in Persian (i.e. *mi-šod-Ø* and also *bâyad*, though this verb has no formally different past tense form and the same form is actually used for present and past situations) can be used deontically to give permission or lay obligation in the past, while in English, as Palmer argues deontic modals are performative and “can have no past tense forms for past time [... as] [o]ne cannot in the act of speaking give permission, lay obligation or give an undertaking in the past or in relation to past events” (1990: 79).

Finally, in Persian unlike English, it is not impossible for certain modals to follow or precede one another (e.g. co-occurrences such as ‘*bâyad be-šav-ad/be-tavān*’ or ‘*bâyad mi-šod-Ø*’ are acceptable). But as Palmer notes restrictions such as the performative nature of the modals or their co-occurring restrictions are “peculiarly characteristic of English” and “other languages [...] especially those of

Europe, have what appear to be modal verbs, which, nevertheless, have past tense forms and can co-occur with one other" (1990: 11).

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### References

- Coates, Jennifer. *The Semantics of Modal Auxiliaries*. London and Canberra: Croom Helm, 1983.
- . "The Expression of root and epistemic possibility in English". In J. Bybee and S. Fleischman, (eds.), *Modality in Grammar and Discourse*, 55-66. Amsterdam: Benjamins, 1995.
- Crystal, David. *A Dictionary of Linguistics and Phonetics*. Oxford: Blackwell, 2003.
- Ehrman, M. E. *The Meaning of the Modals in Present-Day American English*. The Hague: Mouton, 1966.
- Groefsema, Marjolein "Can, may, must and should: A relevance-theoretic account". *Journal of Linguistics*, 31 (1995): 53-79, doi: 10.1017/S0022226700000566.
- Huddleston, Rodney. & Geoffrey. K. Pullum. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press, 2002.
- Kearns, K. *Semantics*. England: Palgrave Publisher Ltd, 2000.
- Lyons, John. *Semantics*. 2nd vol. Cambridge: Cambridge University Press, 1977.
- Palmer, Frank. R. *Mood and Modality*. Cambridge: Cambridge University Press, 1986.
- . *Modality and the English Modals*. London and New York: Longman, 1990.
- . *Mood and Modality*. 2nd edition. Cambridge: Cambridge University Press, 2001.
- Papafragou, Anna. (1998). "Inference and word meaning: The case of modal auxiliaries". *Lingua* 105 (1998): 1-47, doi: 10.1016/S0024-3841(97)00029-6.
- . *Modality and the Semantics-Pragmatics Interface*. Amsterdam: Elsevier, 2000.
- Rahimian, Jalal. "Clause Type and other Aspects of Clause structure in Persian: a study towards comparison with English" (MS). Unpublished Ph.D. Dissertation. Brisbane: Queensland University, 1995.
- Safavi, K. *An Introduction to semantics*. Tehran: Sohr Mehr, 2004.
- Sperber, Dan & Deirdre Wilson. *Relevance: Communication and Cognition*. Oxford: Blackwell, 1995.



- Sweetser, Eve. "Root and epistemic modalities: Causality in two worlds". Berkeley Linguistic Society Papers 8 (1982): 484-507.
- . *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure*. Cambridge: Cambridge University Press, 1990.
- Traugott, Elisabeth C. "Approaching modality from the perspective of Relevance Theory". *Language Sciences* 25 (2003): 657-669, doi: 10.1016/S0388-0001(03)00017-2.
- Von Wright, Georg H. *An Essay in Modal Logic*. Amsterdam: North Holland, 1951.
- Walton, A. (1988). *The Pragmatics of the English Modal Verbs*. (MS) PhD Dissertation. London: University of London.

Appendix 1:

#### NOTATIONAL CONVENTIONS FOR CITING PERSIAN EXAMPLES

The Persian examples cited in this thesis have three representations: (i) the phonemic representation of the Persian sentence; (ii) an item-by-item gloss; (iii) an English translation. In the gloss line small capitals represent grammatical items and ordinary type shows lexical items. Hyphens are used to indicate different components of a single Persian item and full stops show that the parts belong to the same Persian item. The phonemic and grammatical symbols used to represent Persian sentences are as follows:

#### PHONEMIC SYMBOLS

| Symbols  | Phonemic features                | Examples              |
|----------|----------------------------------|-----------------------|
| <i>q</i> | voiced, post-velar, stop         | <i>qâb</i> 'frame'    |
| <i>x</i> | voiceless, post-velar, fricative | <i>xâki</i> 'khaki'   |
| <i>ʔ</i> | voiced, glottal, stop            | <i>ʔaz</i> 'from'     |
| <i>i</i> | unrounded, high, front           | <i>xâki</i> 'khaki'   |
| <i>e</i> | unrounded, mid, front            | <i>del</i> 'heart'    |
| <i>a</i> | unrounded, low, front            | <i>man</i> 'I'        |
| <i>u</i> | rounded, high, back              | <i>kuh</i> 'mountain' |
| <i>o</i> | rounded, mid, back               | <i>do</i> 'two'       |
| <i>â</i> | rounded, low, back               | <i>bâd</i> 'wind'     |

The other symbols used for the phonemic representation of Persian sentences are approximately the same as their English counterparts.

| SYMBOLS | GLOSS                               |
|---------|-------------------------------------|
| CAN     | modal TAVÂN                         |
| COMP    | complement marker                   |
| COMPVE  | comparative adjective/adverb marker |
| CLUSB   | clause subordinator <i>ke</i>       |
| FUT     | future auxiliary                    |
| IMPF    | imperfective marker                 |
| INDEF   | indefinite marker                   |
| INFV    | infinitive marker                   |
| LINK    | subordinator <i>e</i>               |
| MAY     | modal ŠOD-AN                        |
| MUST    | modal BÂYAD                         |
| NEG     | negative marker                     |
| NIN     | non-indicative marker               |
| NPS     | non-past stem                       |
| PASS    | passive auxiliary                   |
| PERF    | perfect auxiliary BUD-AN            |
| PL      | plural marker                       |
| PRES    | present                             |
| PROG    | progressive auxiliary DÂŠT-AN       |
| PN      | person-number ending                |
| PS      | past stem marker                    |
| PTP     | participle                          |
| SG      | singular                            |

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