

Aspectual distinctions in Farsi indicative and subjunctive forms

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Abstract

This paper concerns with tense, aspect, and mood (TAM) morphology in Farsi. Decomposing the TAM information in Farsi verbal forms, this paper argues that the category of mood in Farsi marks the presence or absence of deictic tenses. The traditionally called *subjunctive* forms in Farsi are distinguished because the morphological manifestation of Farsi aspectual markers is conditioned on the presence and the absence of deictic tenses. Indicative forms mark the presence of deictic tenses (past and present) and subjunctive forms mark the absence thereof (or equivalently the presence of zero tense). The paper presents a semantic analysis of tense and aspect in Farsi within the framework of situation semantics without explicit quantification over events in the object language (Cipria & Roberts 2000).

Keywords: tense, aspect, mood, subjunctive, indicative.

1 Introduction

Verbs in Farsi are inflected for person, number, tense, aspect, and mood. Like other Indo-Iranian languages, the verbal system of Farsi revolves around two *so-called verb stems*: (i) Stem I traditionally called the present stem and (ii) Stem II which is traditionally called the past stem and is regularly derived by the addition of the suffix *-id* (and other allomorphs) to Stem I (Windfuhr 1979, Windfuhr & Perry 2013).

root	Stem I	Stem II
buy: $\sqrt{\text{xar}}$	xar	xar-id
eat: $\sqrt{\text{xor}}$	xor	xor-d
kill: $\sqrt{\text{koš}}$	koš	koš-t

Table 1: Verbal stems in Farsi

These stems combine with agreement morphology, presented below. Notice that there is a difference in the third person singular morphology between these two stems.

root	1SG	2SG	3SG	1PL	2PL	3PL
Stem I	xar- am	xar- i	xar- ad	xar-im	xar-id	xar-and
Stem II	xar-id- am	xar-id- i	xar-id- \emptyset	xar-id- im	xar-id- id	xar-id- and

Table 2: Agreement morphology in Farsi

Following Kalin & Atlamaz (2015) and Anoushe (2018), I posit that Farsi verb stems are decomposed into morphemes (either overt or phonologically null) that encode semantic information about temporal relations. This paper aims to offer a detailed decompositional account of main verbal forms in Farsi. It argues the categories of indicative and subjunctive in Farsi are further subdivided into three distinct groups based on their aspectual properties: perfective, imperfective and perfect forms.

2 Indicative

Indicative forms in Farsi are characterized by the presence of deictic tenses, specifically the present tense and past tense. Both the present and past forms of Farsi verbs are further categorized into three main groups based on their aspectual properties: perfective, imperfective, and perfect.¹ This section provides an semantic analysis of main indicative forms in Farsi.

2.1 Aspect and Present Tense

Farsi lacks an overt present tense marker. The traditionally called ‘present stem’ consists of the verb root and a null suffix, as shown in (34).

$$(1) \quad T[\text{PRES}] \rightarrow -\emptyset$$

In this section I explore the combination of present tense with imperfective, progressive and perfect aspect. I postpone the discussion of present perfective to Section 2.3.

2.1.1 Present imperfective and progressive

The morphological realization of imperfective aspect in Farsi indicative verbal forms is the prefix *mi-* (Taleghani 2008).

$$(2) \quad \text{Asp}[\text{IMPF}] \rightarrow \textit{mi-} \qquad \textit{to be revised}$$

To refer to a present eventuality, the bare form of non-stative verbs is necessarily marked with imperfective aspect prefix *mi-*, as shown in (3).

$$(3) \quad \textit{dar xiaban, ye sag pars} \ *(\textit{mi})\textit{-kon-}\emptyset\textit{-ad}$$

in street, a dog bark **IMPF**-do-PRES-3SG

*A dog is barking in the street.*²

¹In this paper, I will set the progressive aspect aside.

²It is worth noting that the equivalent of the verb **bark** in Farsi is a complex predicate consisting of a nominal element ‘*pars: bark*’ and a verbal element that carries inflectional morphemes. Folli et al. (2005) analyze the verbal elements (light verb) as an overt *v* head.

The null copular verb *be* and the stative verb *have* are incompatible with the imperfective marker *mi-*.

- (4) *Anba alan xune *mi-∅-and*
 they now home IMPF-be.PRES-3PL
They are home now.
- (5) *Anba do-ta mašin *mi-dar-∅-and*
 Anha two-CL car IMPF-have-PRES-3PL
They have two cars.

Instead, the null copular verb *be* and the bare form of stative verb *have*, as in (6) and (7), inflected for agreement, refers to a state that is held in the utterance time.

- (6) *Anba alan xune ∅-and*
 they tomorrow/now home be.PRES-3PL.
they are home now.
- (7) *Anba do-ta mašin dar-∅-and*
 they two-CL car have-PRES-3SPL
They have two cars.

In addition to describing ongoing events and states, the imperfective verb also has the canonical generic and habitual interpretations, as shown in (8) and (9), respectively. Note that the presence of imperfective aspect with the present form of non-stative verbs is obligatory.

- (8) *sag-ha pars *(mi)-kon-∅-and*
 dog-PL bark IMPF-do-PRES-3PL
Dogs bark.
- (9) *Ali footbal bazi *(mi)-kon-∅-ad.*
 Ali football play IMPF-do-PRES-3SG
Ali plays football.

The present form of the copular verb in Farsi can also describe a future event, as shown in (10).

- (10) *Anba farda xune ∅-and*
 they tomorrow home be.PRES-3PL
They will be home tomorrow.

The future-oriented interpretation of present tense verb in Farsi is different from the futurate reading in English, as shown in (11). Copley (2009) defines a futurate as a future-oriented reading of a sentence with no obvious means of future reference. The eventuality described in the sentence, however, must be *plannable*. An unplannable future event cannot be described without an overt future marker, as the infelicity of (12) and (13) shows.

- (11) The Red Sox play the Yankees tomorrow.
 (12) # The Red Sox defeat the Yankees tomorrow.

(13) *Before tossing the coin: #* The coin comes up heads.

In Farsi, however, present imperfective verbs not only can be used to describe a plannable future event, as shown in (14), but also to make a prediction about an unplannable future eventuality, as shown in (15) and (16).

(14) *Farda Esteqlal ba Perspolis bazi mi-kon-∅-ad.*
tomorrow Esteqlal with Perspolis play IMPF-do-PRES-3SG
Esteqlal plays Perspolis Tomorrow.

(15) *Farda Esteqlal Perspolis ro šekast mi-dab-∅-ad*
tomorrow Esteqlal Perspolis RA defeat IMPF-give-PRES-3SG
Esteqlal defeats Perspolis tomorrow.

(16) *Sekke šir mi-ay-∅-ad*
coin heads IMPF-come-PRES-3SG
The coin will come up heads.

I should also note that the future interpretation of present imperfective verbs in Farsi is compatible with complete and incomplete telic eventualities.

- (17) a. *Ta do mah-e dige xune mi-saz-∅-ad*
by two month-EZ other house IMPF-build-PRES-3SG
He will be build a house until the next two months.
51 and then the house will be ready.
51 Then he'll take a break and will continue building the house later.³
- b. *Ta do mah-e dige xune ro mi-saz-∅-ad*
by two month-EZ other house RA IMPF-build-PRES-3SG
He will build the house by the next two months.⁴

While I will not discuss the progressive aspect in Farsi in this paper, it is worth mentioning that imperfective form of the verb in Farsi can combine with an inflected progressive auxiliary (*have*) to describe an ongoing event, as shown in (18). The presence of progressive aspect forces the ongoing reading of imperfective aspect, which can otherwise get a wider range of interpretations.

(18) *dar xiaban, ye sag dar-∅-ad pars mi-kon-∅-ad*
in street, a dog PROG-PRES-3SG bark IMPF-do-PRES-3SG
A dog is barking in the street.

Progressive aspect is the preferred way of talking about an ongoing event, but the ongoing reading of imperfective aspect is still available.

Present progressive verbs in Farsi, as in (19), are compatible with future-oriented temporal adverbials. The presence of the progressive aspect here emphasizes the existence of a firm plan for the eventuality to happen.

(19) *Farda sa'at-e 5, man dar-∅-am tu cinema film mi-bin-∅-am.*
tomorrow clock-EZ 5 I PROG-PRES-1SG at cinema movie IMPF-see-PRES-1SG
Tomorrow at 5 o'clock, I will be watching a movie at the cinema.

³Thanks to Sabine Iatridou for bringing this to my attention.

⁴The DOM marker *ra* enforces a completed reading.

2.1.2 Present Perfect

The present perfect form of a verb is constructed with the past participle and the agreement inflected null auxiliary *be*.

- (20) *taze sandevich dorost karde Ø.am*
 fresh sandwich made do.PPL AUX.PRES.1SG
I've just made a sandwich.

As is the case with all Farsi verbs in present tense, present perfect verbs in Farsi are compatible with a future reference time.

Context: It's 5 PM right now. Sarah has just started making dinner and Mary has just left her office to go home. It takes Sarah 30 minutes to make dinner, and Mary an hour to get home.

- (21) *ta vaghti Mary be-res-ad, Sarah šam ra amade karde ast.*
 by when Mary IMPF-arrive-Ø-3SG, Sarah dinner RA ready do-PPL AUX.PRES.3SG
*'By the time, Marry arrives, Sarah will have made dinner.'*⁵

The perfect aspect is a higher aspect head that can combine with either imperfective or perfective aspect. Since Farsi has an overt imperfective marker, the absence of this marker in present perfect forms indicates that the lower aspect is perfective. An argument in favor of this view comes from aspectual restrictions on some stative verbs like *know*. The verb *know* in Farsi always carries imperfective aspect.

- (22) a. *Ali javab-e soal ra mi-dan-Ø-ad.*
 Ali answer-EZ question RA IMPF-know-PRES-3SG
Ali knows the answer to the question.
 b. # *Ali javab-e soal ra dan-est/ dan-este ast.*
 Ali answer-EZ question RA know.PST.PERF.3SG/ know-PP AUX-PRES.3SG
Ali knew/has known the answer to the question.

Perfective and perfect forms of this verb can only mean *realize* or *consider*.

- (23) a. *man az ro-id-an-e xar-e sar-e divar danest-am ke*
 I from grow-PST-NOM-EZ thorn-EZ head-EZ wall know.PERF.PST-1SG that
nakas kas ne-mi-gard-Ø-ad az in bala nešini-ha
 nobody somebody NEG-IMPF-look-PRES-3SG from this top sitting-PL
I realized from the thorn growing on the top of the wall that 'nobody' doesn't become 'somebody' by sitting on the top. Saeb Tabrizi (Persian poet)
 b. *raees jombhor ejabr-e mask ra yek tasmim-e melli dan-este*
 prsident republic manadate-EZ mask RA a decision-EZ national know-PP
ast.
 AUX-PRES.3SG
The president has considered the mask mandate a national decision.

⁵The third person form of the null copula *be* is morphologically realized as *ast*.

This aspectual restriction is removed when an imperfective marker is added to the perfect form of the verb.

- (24) *hame-ye in moddat Ali javab-e soal ra mi-dan-este ast.*
 all-EZ this duration Ali answer-EZ question RA IMPF-know-PP AUX-PRES.3SG
All this time, Ali has known the answer to the question.

In languages, like English, that do not morphologically distinguish between perfective and imperfective aspect, these two perfect forms have the same morphological representation. Evidence for this comes from the contrast in the availability of habitual and generic readings with present perfect in the two languages. While English present perfect can have habitual and generic readings, the presence of an imperfective marker is necessary to get these readings in Farsi.

- (25) a. Since the beginning of existence, the Earth has revolved around the sun.
 b. *Az aqaz-e hayat, zamin dor-e xoršid #(mi)-čarxide*
 Since beginning-EZ existence, Earth around-EZ sun IMPF-revolve.PP
ast.
 AUX.PRES.3SG
Since the beginning of existence, the Earth has revolved around the sun.

Moreover, it has been cross-linguistically observed that universal readings of perfect are only possible with perfects built out of statives (homogeneous predicates) (Dowty 1979, Mittwoch 1988, Portner 2003, Vlach 1993 and Iatridou et al. 2003). This can be seen in the contrast in (26). While the sentence with a stative predicate in (26a) can have a universal (continuative) interpretation, (26b) with a stage level eventive predicate can only have an existential interpretation.

- (26) a. John has been sick (for several days).
 b. John has slept. (Portner 2011)

In Farsi where perfect from embedding imperfective and perfective have distinct morphological realizations, universal perfect readings are only possible when the lower aspect is imperfective. The sentence in (27a) can only have an existential perfect reading. When there is an imperfective aspect, as in (27c), the universal perfect reading becomes available.

- (27) a. *# Sara az sa'at-e 3 ketab xande ast.*
 Sara since clock-EZ 3 book read.PP AUX.PRES.3SG
Sara has read a book since 3.
 b. *Sara az sa'at-e 3 ta 4 ketab xande ast.*
 Sara since clock-EZ 3 to 4 book read.PP AUX.PRES.3SG
Sara has read a book from 3 to 4. (listing things Sara did today)
 c. *Sara az sa'at-e 3 ketab mi-xande ast.*
 Sara since clock-EZ 3 book IMPF-read.PP AUX.PRES.3SG
Sara has been reading a book since 3.

It should, however, be noted that (27c) does not actually entail that the reading event is still ongoing. (27c) is compatible with the continuation "she got tired, and is now resting".

In languages like English, present perfect does not felicitously combine with 'specific' past time adverbials. This fact, which is known as the *present perfect puzzle* (Klein 1992), is illustrated in (28). The incompatibility of present perfect and specific temporal adverbials is not found in all languages. Pancheva & Von Stechow (2004) note that present perfect can felicitously combine with temporal adverbials in German (as shown in (29)), Dutch, French, Icelandic, or Italian. As the grammaticality of (30) shows, Farsi also lacks a ban against such combinations.

- (28) *John has arrived yesterday.
 (29) *Hans ist gestern um zehn weggegangen.*
 Hans is yesterday at 10 left
Hans has left yesterday at 10. (Musan 2001)
 (30) *Ali dirooz reside ast.*
 Ali yesterday arrive.PP AUX.PRES.3SG
Ali has arrived yesterday.

Another point of divergence among languages with respect to present perfect are so-called *life-time* effects. As the example in (31) shows, the present perfect in English cannot be felicitously used with dead persons or no longer existing objects (Portner 2003).

- (31) # Einstein has visited Princeton.

In languages like French (32a) or German (32b), on the other hand, such *life-time* effects don't arise (Schaden 2009).

- (32) a. *Einstein a visité Princeton.*
 Einstein has visited Princeton
 b. *Einstein hat Princeton besucht.*
 Einstein has Princeton visited
 (Schaden 2009)

The felicity of the example (33) shows that life-time effects do not obtain for the present perfect in Farsi.

- (33) *Ebn-e-sina be Ray safar karde ast.*
 Avicenna to Ray travel do.PP AUX.PRES.3SG
Avicenna has travelled to Ray.

2.2 Aspect and Past Tense

The traditionally called 'past stem' consists of the verb root and an allomorph of the suffix *-id* which is ambiguous between past and perfective, as shown in (34). We will see examples where this morpheme appears in past imperfective (e.g., (38)) as well as in present perfective (e.g., (47)) and subjunctive perfective (e.g., (66) and (69)).

- (34) T[PST] → *-id*
 Asp[PERFECTIVE] → *-id*

2.2.1 Past perfective

To express a culminated past event, the verb must be marked with one of the allomorphs of the suffix *-id*, as shown in (35) and (36).

- (35) *Zabrah raf-t.*
 Zahra leave-PERF.PST.3SG
Zabrah left.
- (36) *vaghti tu otaq bud-am, Jyoti avaz xan-d*
 when in room be.PST-1SG, Jyoti song sing-PERF.PST.3SG
When I was in the room, Jyoti sang.

Although both past tense and perfective aspect have a morphological realization as the suffix *-id*, there is only one occurrence of suffix *-id* to mark a past perfective verb. The reason is that there is a restriction on the number of TAM affixes a verb can bear in some Indo-Iranian languages like Farsi and Adiyaman Kurmanji (Kalin & Atlamaz 2015). Verbs in these languages cannot bear more than one TAM suffix or more than one TAM prefix. The co-occurrence of a TAM prefix and a TAM suffix, however, is allowed. Therefore, I propose that *-id* can be morphological realization of the past perfective in Farsi (see also Windfuhr & Perry (2013) for a similar proposal), as shown in (37).

- (37) T[PST] [Asp[PERFECTIVE]] → *-id*

2.2.2 Past imperfective and progressive

The past imperfective form of the verb, which contains the past morpheme and the imperfective prefix *mi-*, can describe an event that was ongoing in a past time, as shown in (38a) and (38b). It can also describe a generic statement that held true in the past (38c), as well a past habit (38d).

- (38) a. *dar xiaban, ye sag pars mi-kard.*
 in street, a dog bark IMPF-do.PST.3SG
A dog was barking in the street.
- b. *vaghti madar-am vared-e otaq-am shod, ba doost-am barf mi-zad-am.*
 when mother-my enter-EZ room-my become.PERF.PST-3SG, to friend-my talk
 IMPF-hit.PST-1SG
When my mother came into my room, I was talking with my friend.
- c. *dainasur-ha-ye Tirez gušt mi-xor-d-and.*
 dinosaur-PL-EZ T-Rex meat IMPF-eat-PST-3PL
T-Rex dinosaurs ate meat.
- d. *man qablan sigar mi-keš-id-am.*
 I before cigarette IMPF-smoke-PST-3SG
I used to smoke before.

The past imperfective form of the verb can also combine with the past form of the progressive auxiliary to describe an ongoing event in the past. This is shown (39) and (40).

- (39) *dar xiaban, ye sag dašt pars mi-kard.*
 in street, a dog **PROG.3SG** bark **IMPF-do.PST.3SG**
A dog was barking in the street.
- (40) *vaghti madar-am vared-e otaq-am shod, dašt-am ba*
 when mother-my enter-EZ room-my become.PERF.PST-3SG, have.PST-1SG to
doost-am harf mi-zad-am.
 friend-my talk IMPF-hit.PST-1SG
When my mother came into my room, I was talking with my friend.

As stative verbs are incompatible with the imperfective prefix, as was shown in (4) and (4), the past form of stative verbs *be* and *have* in (41a) and (41b), refers to a state that was held in the past.

- (41) a. *Sa'at-e 3 Ali xune bud.*
 clock-EZ 3 Ali home be.PST.3SG.
Ali was home at 3 o'clock.
- b. *Ali do-ta mašin dašt.*
 Ali two-CL car have.PST.3SG
Ali had two cars.

2.2.3 Past perfect

The past perfect form of a verb is constructed with the past participle and the past form of auxiliary *be* which is inflected for agreement.

- (42) *vaqti Bill vared-e otaq shod, John taze yek sandewich dorost karde*
 when Bill enter-EZ room become-**PERF.PST.3SG**, John fresh a sandwich made do.PP
bud
AUX.PST.3SG
 When Bill walked into the room, John had just made a sandwich.

2.3 Future

There are four strategies in Farsi to describe a future event. The most common way of describing a future eventuality in colloquial Farsi is to use present imperfective⁶, as in (43). As we will see in the section 2.1, present tense in Farsi has a non-past semantics and thus it can freely take a future time reference.

- (43) *Farda be bimarestan mi-rav-∅-am.*
 tomorrow to hospital **IMPF-go-PRES-1SG**
I will go to the hospital tomorrow.

The second strategy is to use the agreement inflected future auxiliary *want* followed by the perfective form of the verb with a default third person agreement, as in (52). This form is mainly used in formal contexts.

⁶As I mentioned earlier, the present perfect in Farsi is compatible with a future reference time, as in (21)

- (44) *Farda be bimarestan xab-∅-am raft.*
 tomorrow to hospital AUX-PRES-1SG go.PERF.∅.3SG
*I am going to the hospital tomorrow.*⁷

An interesting property of this construction is the use of what seems to be the *past* form of the verb (Bjorkman & Halpert 2017). In descriptive grammars of Farsi, however, this form has been analyzed as a short infinitival form (Anvari & Ahmadi Givi (1995), Khanlari (1988)).⁸ It is important to note that this future form is only compatible with perfective interpretations, and is incompatible with an imperfective reading. The infelicity of (53b) in the following context illustrates this fact. Therefore, I take the verb in the future construction (52) to bear perfective morphology and to lack a deictic tense.

- (45) *Context: Sarah has terminal cancer. She has just started writing a long novel. Doctors think she will only live few more days and will die prior to the completion of her book.*
- a. *moghe-ye marg, Sarah (dar-∅-ad) ketab mi-nevis-∅-ad.*
 time-EZ death, sarah AUX-PRES-3SG book IMPF-write-PRES-3SG
Sarah will be writing a book at the time of her death.
- b. *#moghe-ye marg, Sarah ketab xab-∅-ad nevešt.*
 time-EZ death, sarah ketab AUX-PRES-3SG write-PERF.∅.3SG
Sarah will be writing a book at the time of her death.

The third strategy is to use the present imperfective form of *want* and the so-called ‘*subjunctive*’ form of the verb, as in (46). This form has a volitional future reading.

- (46) *Farda Sarah mi-xab-∅-ad be bimarestan be-rav-ad.*
 tomorrow Sarah IMPF-want-PRES-3SG to hospital IMPF-go.∅-3SG
Sarah will go to the hospital tomorrow.

Lastly, the perfective form of *eventive* verbs inflected with agreement morphology can be used to refer a future event. The future use of this form is limited to event that are going to be completed in the imminent future, and is not felicitous with a future adverbials.

- (47) *Ali’s mom talking to him on the phone: “Everyone is waiting for you to come home.” Ali:*
- a. *umad.∅-am*
 come.PERF-PRES-1SG
I’m coming (right away).
- b. *#farda umad.∅-am*
 tomorrow come.PERF-PRES-1SG
I’m coming tomorrow.

The perfective form of stative verbs doesn’t lend itself to a future interpretation.

- (48) *Ali’s friend is waiting outside Ali’s house. They are going to a concert. Ali:*

⁷∅ in glosses represents zero tense.

⁸Farsi is believed to lack infinitive clauses.

- a. # *amade bud.∅-am*
 ready be.PERF-PRES-1SG
intensified meaning: I'll be ready (right away).
- b. *amade sbod.∅-am*
 ready get.PERF-PRES-1SG
I'll get ready (right away).

Unlike the general trend in descriptive grammars of Iranian languages that takes verbs bearing *-id* morpheme to encode pastness (hence the term *past stem*), Windfuhr & Perry (2013) take them to be an unmarked form which only encode a perfective meaning. However, the fact that verbs bearing *-id* morpheme can combine with imperfective prefix *mi-* to describe a past imperfective event suggests that *-id* is ambiguous between past and perfective readings. Given that imperfective aspect has an overt morphological realization, we can deduce the existence of perfective aspect in (47a) and (48b) from the absence of an imperfective marker. What is tense in these sentences? There are three logical possibilities: past, present and zero tense. As there is no past meaning involved, we can put aside this option. Zero tense is also ruled out because its occurrence in matrix clauses is limited to expression of wishes and desires (I will discuss this in the next section). The sentences under consideration are clearly not about wishes and desire. The only option left is present tense. We have independently seen that present tense in Farsi has a non-past semantics, and compatible with future reference. Therefore, I will take the verbs in (47a) and (48b) to be the morphological realization of present perfective in Farsi, as shown below.

(49) T[PRES] [Asp [PERFECTIVE]] → ∅-id

It has been cross-linguistically observed that perfective aspect appears to be incompatible with present tense. De Wit (2016) refers to this observation as the ‘*present perfective paradox*’. The structure I have proposed in (49) raises the question as to whether Farsi lacks the “*present perfective paradox*”. There seems to be variations among languages with respect to the acceptability of the combination of present tense and perfective aspect, as well as the interpretations such a combination can get. The present perfective paradox is reported to be absent in French, Dutch and German. De Wit (2016) shows that the sentence (50) can be felicitously used by French speakers to convey that they are going home.

(50) *Ne t' inquiète pas, j' arrive à toute suite*
 REFL 2SG worry.PRES.2SG NEG 1SG arrive.PRES.1SG at right away
 ‘Don’t worry, I’m arriving—see you right away!’

De Wit (2016), however, argues that the incompatibility between present tense and perfective aspect is rooted in cognition, and thus it is universal. The present form of verbs in languages that appear to lack such an incompatibility has properties that make it difficult to draw a conclusion about the status of the present perfective paradox. Following Smith (1997), she argues that imperfective and perfective aspects don’t have a morphological realization in French, Dutch and German. Thus, the present form of the verb is ambiguous between perfective and imperfective readings. This has been illustrated with the example (51) by Smith (1997). As the translation

shows, (51) allows for two interpretations. The events of *Mary smiling* and *Paul arriving* can either be overlapping (i.e., imperfective) or sequential (i.e., perfective).⁹

- (51) *Marie sourit toujours quand Paul arrive à la maison.*
 Mary smile.PRES.3SG always when Paul arrive.PRES.3SG LOC DEF.SG.F house
Mary always smiles / is always smiling, when Paul gets home.

Based on this, she concludes that aspect in the sentence (50) is in fact imperfective. Given that imperfective aspect in Farsi has a distinct morphological realization, the same analysis cannot be entertained. As it was discussed in the section 2.1, present tense in Farsi patterns with present tense in German and Dutch in having a non-past semantics, and can freely refer to a future time (Pancheva & Von Stechow 2004). Unlike the case with present imperfective and present perfect aspect, however, the future reading of present perfective is limited to imminent events. The example (48b) also shows that present perfective is not compatible with future-oriented adverbs. Therefore, I take the restriction on the future interpretation of present perfective in Farsi to be the footprint of the present perfective paradox in Farsi.

The second strategy is to use the agreement inflected future auxiliary *want* followed by the perfective form of the verb with default third person agreement, as in (52). This form is mainly used in formal contexts.

- (52) *Farda be bimarestan xah-∅-am raft.*
 tomorrow to hospital AUX-PRES-1SG go.PERF.∅.3SG
*I am going to the hospital tomorrow.*¹⁰

An interesting property of this construction is the use of what seems to be the *past* form of the verb (Bjorkman & Halpert 2017). In descriptive grammars of Farsi, however, this form has been analyzed as a short infinitival form (Anvari & Ahmadi Givi (1995), Khanlari (1988)).¹¹ It is important to note that this future form is only compatible with perfective interpretations, and is incompatible with an imperfective reading. The infelicity of (53b) in the following context illustrates this fact. Therefore, I take the verb in the future construction (52) to bear perfective morphology and to lack deictic tense.

- (53) *Context: Sarah has terminal cancer. She has just started writing a long novel. Doctors think she will only live few more days and will die prior to the completion of her book.*
- a. *moghe-ye marg, Sarah (dar-∅-ad) ketab mi-nevis-∅-ad.*
 time-EZ death, sarah AUX-PRES-3SG book IMPF-write-PRES-3SG
Sarah will be writing a book at the time of her death.
- b. *#moghe-ye marg, Sarah ketab xah-∅-ad nevest.*
 time-EZ death, sarah ketab AUX-PRES-3SG write-PERF.∅.3SG
Sarah will be writing a book at the time of her death.

⁹The issue is more complex. De Wit (2016) notes that northern Slavic languages that lack other dedicated future construction use present perfective to refer to future situations.

¹⁰∅ in glosses represents zero tense.

¹¹Farsi does not have infinitive clauses.

3 Subjunctive

Farsi lacks infinitive clauses, and the subjunctive is used in environments where an infinitive form is expected. In this section I argue, following ideas by Windfuhr & Perry (2013) and Darzi & Kwak (2015), that the so-called *subjunctive* forms in Farsi lack deictic temporal features. That is, the distinction between indicative and subjunctive moods in Farsi is in the presence or the absence of deictic tense.

The embedded clause of certain predicates and modals as well as the antecedent of conditionals appear in the subjunctive form. The occurrence of subjunctive forms in matrix clauses is restricted to the expression of wishes (as in (54a)), and suggestions (as in (54b)) (Darzi & Kwak 2015, Windfuhr & Perry 2013). I show the subjunctive forms with \emptyset in glosses, indicating that subjunctive forms lack deictic tense.

- (54) a. *xoda beh-et sabr be-dab-ad.*
 god to-you patience IMPF-give. \emptyset -3.SG
May god give you the patience.
- b. *be-rim*
 IMPF-go. \emptyset -1PL
let's go.

It has been widely assumed that the prefix *be-* in Farsi is the subjunctive marker in Farsi. However, not all subjunctive forms in Farsi carry this morpheme. Thus, the difference between subjunctive forms needs an explanation. I argue that Farsi has three subjunctive forms that are distinguished based on their aspectual properties: imperfective, perfect, and perfective.

3.1 Subjunctive imperfective

Let us start with imperfective subjunctive, which is traditionally called simple subjunctive. This form is made with adding the prefix *be-* to the verbal root.

- (55) *be-rav-ad*
 IMPF-go- \emptyset -3SG

Darzi & Kwak (2015) observe that the temporal orientation of an embedded clause that is marked with subjunctive imperfective (*present subjunctive* is *simultaneous or after* the reference time which is the matrix event time, as in (56a) and (107).

- (56) a. *Reza fekr mi-kard ke Ali diruz/emruz/farda be-rav-ad*
 Rez thought IMPF-do.PST.3SG that Ali yesterday/today/tomorrow IMPF-go- \emptyset -3SG
unja.
 there
 ‘Reza thought that Ali would go there yesterday/today/tomorrow.’
- b. *Reza fekr mi-kon- \emptyset -ad ke Ali *diruz/emruz/farda*
 Rez thought IMPF-do-PRES-3SG that Ali yesterday/today/tomorrow
be-rav-ad unja.
 IMPF-go- \emptyset -3SG there
 ‘Reza thinks that Ali is going there *yesterday/today/tomorrow.’

adapted from (Darzi & Kwak 2015)

Crucially, the counterparts of these sentences with matrix verb ‘know’, which only takes indicative complements, have an imperfective in their embedded clauses.

- (57) a. *Reza mi-dan-est ke Ali diruz/emruz/farda mi-rav-∅-ad*
 Rez IMPF-know-PST.3SG that Ali yesterday/today/tomorrow IMPF-go-PRES-3SG
unja.
 there
 ‘Reza knew that Ali would go there yesterday/today/tomorrow.’
- b. *Reza mi-dan-∅-ad ke Ali diruz/emruz/farda mi-rav-∅-ad*
 Rez IMPF-know-PRES-3SG that Ali yesterday/today/tomorrow IMPF-go-PRES-3SG
unja.
 there
 ‘Reza knows that Ali is going there *yesterday/today/tomorrow.’

Another argument in favor of imperfectivity of subjunctive verb forms with *be-* is that they can express generic meaning, like its indicative counterpart *mi-*.

- (58) a. *man fekr mi-kon-∅-am ke zamin dor-e xoršid be-čarx-ad*
 I thought IMPF-do-PRES-1SG that earth around-EZ sun IMPF-revolve.∅-3SG
I think that earth revolves around the sun.
- b. *man mi-dan-∅-am ke zamin dor-e xoršid mi-čarx-∅-ad*
 I IMPF-know-PRES-1SG that earth around-EZ sun IMPF-revolve-PRES-3SG
I know that earth revolves around the sun.

3.2 Subjunctive perfect

The second subjunctive form is subjunctive perfect, traditionally called past subjunctive. It is made with the past participle and the subjunctive form of the auxiliary *be*.

- (59) *rafte baš-ad*
 go-PP AUX.∅-3SG

Darzi & Kwak (2015) also observe that subjunctive perfect locates the event of the embedded clause at a time interval *preceding* the reference time which can be the matrix event time (61a) or a time denoted by a temporal adverbial in the embedded clause (61b).

- (60) a. *Reza fekr mi-kon-∅-ad ke Ali diruz unja rafte baš-ad*
 Reza thought IMPF-do.PRES.3SG that Ali yesterday there go-PP AUX.∅-3SG
 ‘Reza thinks that Ali has gone there yesterday.’
 adapted from (Darzi & Kwak 2015)
- b. *Reza diruz fekr mi-kard ke Ali ta farda unja rafte*
 Rez yesterday thought IMPF-do.PST.3SG that Ali by tomorrow there go-PP
baš-ad
 AUX.∅-3SG
 ‘Yesterday, Reza thought that Ali would have gone there by tomorrow.’

Counterparts of these sentences with matrix verb ‘know’, which only takes indicative complements, have perfect aspect in their embedded clauses.

- (61) a. *Reza mi-dan-∅-ad ke Ali diruz unja rafte ast*
 Reza IMPF-know-PRES-3SG that Ali yesterday there go-PP AUX.PRES.3SG
 ‘Reza knows that Ali has gone there yesterday.’
 adapted from (Darzi & Kwak 2015)
- b. *Reza diruz mi-dan-est ke Ali ta farda unja rafte ast*
 Rez yesterday IMPF-know-PST.3SG that Ali by tomorrow there go-PP
 ast
 AUX.PRES.3SG
 ‘Yesterday, Reza knew that Ali would have gone there by tomorrow.’

Neither perfect subjunctive nor perfect indicative can express generic meaning.

- (62) a. # *man fekr mi-kon-∅-am ke zamin dor-e xoršid čarxide baš-ad.*
 I thought IMPF-do-PRES-1SG that earth around-EZ sun revolve.PP
 AUX.∅.3SG
 I think that earth has revolved around the sun.
- b. # *man mi-dan-∅-am ke zamin dor-e xoršid čarxide ast.*
 I IMPF-know-PRES-1SG that earth around-EZ sun revolve.PP AUX.PRES.3SG
 I know that earth has revolved around the sun.

Given the data presented above, and following Windfuhr & Perry (2013) and Darzi & Kwak (2015), I take subjunctive in Farsi to lack an autonomous time reference. More specifically, I follow the proposal by Ferreira (2017), and posit that subjunctive forms in Farsi are the morphological realizations of zero tense (See also Johnson (1985), Landau (2004), Pica (1984), Picallo (1984) for accounts of the subjunctive in terms of anaphoric tense). It is the higher tense that is responsible for manipulating the temporal location of the event. I propose that *be-* is the morphological realization of zero tense imperfective, as shown in (63a). I also take the prefix *mi-* to not only encode information about the aspectual property of the verb but also about the existence of a value for tense, as shown in (63b). In fact, some traditional grammarians have analyzed *mi-* to be the marker of the indicative mood (Anvari & Ahmadi Givi 1995, Khanlari 1988). The consensus in the literature, however, is that the marker always denotes imperfectivity (Darzi & Kwak 2015, Taleghani 2008, Windfuhr 1979, Windfuhr & Perry 2013). The entry in (63b) captures both of these intuitions.

- (63) a. T[∅][Asp[IMPF]] → *be-*
 (“imperfective subjunctive”)
- b. T[PRES/PST][Asp[IMPF]] → *mi-*
 (“imperfective indicative”)

Similarly, I take subjunctive perfect form to encode zero tense perfect, as shown in (64a).

- (64) a. T[∅][Asp[PERFECT]] → verb.PP AUX.∅: *baš*
 (“perfect subjunctive”)

- b. T[**PRES**][Asp[**PERFECT**]] →verb.PP AUX.PRES: ∅
 (“perfect indicative”: present perfect)
- c. T[**PST**][Asp[**PERFECT**]] →verb.PP AUX.PST: bud
 (“perfect indicative”: past perfect)

3.3 Subjunctive perfective

As Windfuhr & Perry (2013) note, the perfective form of verbs in Farsi can also have a subjunctive function, by which I mean it can lack a deictic temporal specification. That is, it neither patterns with present perfective nor with past perfective. Rather, it only contributes a perfective interpretation. Moreover, like other subjunctive forms in Farsi, it is used when the truth of the sentence bearing a perfective marker is an open issue.

In certain embedded contexts such as under certain modals, the antecedent of conditionals and adverbial clauses, perfective is used to refer to a *future* event or state that will necessarily have been completed by the time of the matrix event.

As we saw in (52), repeated here as (65), the perfective form of the verb appears under the future modal, in which case the modal bears the agreement morphology and the verb appears with perfective morphology and default third person agreement, which is morphologically null.

- (65) *Farda be bimarestan xah-∅-am raft.*
 tomorrow to hospital want-PRES-1SG go.PERF.∅.3SG
I am going to the hospital tomorrow.

It can also appear under impersonal modals, bearing a default third person agreement. These modals can only have a deontic reading.

- (66) a. *bayad haqiqat ra goft.*
 should truth RA say.PERF.∅.3SG
It is necessary to tell the truth.
- b. *mi-tavan haqiqat ra goft.*
 IMPF-can truth RA say.PERF.∅.3SG
 It is possible to tell the truth.
- c. *mi-šav-∅-ad haqiqat ra goft.*
 IMPF-become-PRES-3SG truth RA say.PERF.∅.3SG
It is possible to tell the truth.
- d. *mi-šod haqiqat ra goft.*
 IMPF-become-PST truth RA say.PERF.∅.3SG
It was possible to tell the truth.

It is important to note that these modals only take subjunctive complements and are incompatible with indicative complements.

- (67) a. *bayad haqiqat ra be-gu-yi/ *mi-gu-∅-yi.*
 should truth RA IMPF-say.∅.2SG/ IMPF-say-PRES-2SG
You should tell the truth.

- b. *mi-tavan-i haqiqat ra be-gu-yi/ mi-gu-∅-yi.*
 IMPF-can truth RA IMPF-say.∅.2SG/ IMPF-say-PRES-2SG
 You can tell the truth.
- c. *mi-šav-∅-ad haqiqat ra be-gu-yi/ *mi-gu-∅-yi.*
 IMPF-become-PRES-3SG truth RA IMPF-say.∅.2SG/ IMPF-say-PRES-2SG
 It is possible to tell the truth.
- d. *mi-šod haqiqat ra be-gu-yi/ *mi-gu-∅-yi.*
 IMPF-become-PST truth RA IMPF-say.∅.2SG/ IMPF-say-PRES-2SG
 it was possible to tell the truth.

Another environment perfective subjunctive appears is under the modal adverbial *maybe*, in which case the perfective form of verbs bear agreement morphology. In the same environment, an imperfective subjunctive can also be used, but an imperfective indicative is not felicitous¹².

(68) *The result of lottery will be announced tomorrow:*

- a. *šayad barande šod-i*
 maybe winner become.PERF.∅.2SG
maybe, you'll win.
- b. *šayad barande be-š-i*
 maybe winner IMPF-become-.∅.2SG
maybe, you'll win.
- c. *#šayad barande mi-š-∅-i*
 maybe winner IMPF-become-PRES.2SG
maybe, you'll win.

Subjunctive perfective can appear in the antecedent of conditionals, in which case it refers to a future event whose realization or completion is a precondition for the consequent. The aspectual contrast between subjunctive perfective and imperfective manifests itself when the antecedent contains a stative predicate. Stative predicates are known to be incompatible with perfective aspect, which requires bounded predicates. When perfective aspect combines with unbounded predicates like statives, an eventive interpretation is coerced (Bary 2009, De Swart 1998, Homer 2011). Stage-level stative predicates, like *being tired* in (69a), are coerced in perfective.

(69) Stage-level statives:

- a. *agar Ali xaste bud, mozahem-sš ne-mi-š-∅-am*
 if Ali tired be.PERF.∅.3SG, bother-him NEG-IMPF-become-PRES-1SG
If Ali is (found out to be) tired, I will not bother him.
- b. *agar Ali xaste baš-ad, mozahem-sš ne-mi-š-∅-am*
 if Ali tired be.∅-3SG, bother-him NEG-IMPF-become-PRES-1SG
If Ali is tired, I will not bother him.

Individual-level statives need some contextual support for coercion. The presence of temporal adverbial *then* in (70a) facilitates an eventive interpretation.

¹²That is not to say that indicative forms are ungrammatical with *maybe*, but they are infelicitous in scenarios when the truth of the modal claim is an open issue.

(70) Individual-level statives:

- a. *agar Ali #(un moghe) mehrabun bud, komak-et mi-kon-∅-ad*
 if Ali (that moment) kind be.PERF.∅.3SG, help-you IMPF-do-PRES-3SG
If Ali is being kind then (is in a good mood), he will help you. This cannot mean *If Ali is kind, he will help you.*
- b. *agar Ali mehrabun baš-ad, komak-et mi-kon-∅-ad*
 if Ali (that moment) kind be.∅-3SG, help-you IMPF-do-PRES-3SG
If Ali is being kind then (is in a good mood), he will help you. and *If Ali is kind, he will help you.*

Certain individual-level predicates like *intelligent* cannot be coerced, and thus are incompatible with perfective. The infelicity of (71a) illustrates this fact.

(71) Individual-level statives:

- a. *#agar Ali babuš bud, javab-e in soal ra*
 if Ali intelligent be.PERF.∅.3SG, answer-EZ this question RA
mi-dan-∅-ad
 IMPF-know-PRES-3SG
If Ali is intelligent, he knows the answer to this question.
- b. *agar Ali babuš baš-ad, javab-e in soal ra mi-dan-∅-ad*
 if Ali intelligent be.∅.3SG, answer-EZ this question RA IMPF-know-PRES-3SG
If Ali is intelligent, he knows the answer to this question.

when clauses and *after* clauses are other contexts where subjunctive perfective can appear, and refer to a future event that is required to be completed before the matrix event.

- (72) a. *vaghti res-id, beb-et zang mi-zan-∅-am*
 when arrive-PERF.∅.3SG to-you call IMPF-hit-PRES-1SG
When she arrives, I will call you.
- b. *bad-e inke kelas-eš tamum shod, beb-et zang mi-zan-∅-am*
 after-EZ that class-her end become-PERF.∅.3SG to-you call IMPF-hit-PRES-1SG
After her class ends, I will call you.

In the same environments, imperfective indicative is infelicitous to refer to future events.

- (73) a. *vaghti be-res-ad/ #mi-res-∅-ad, beb-et zang mi-zan-∅-am*
 when IMPF-arrive.∅.3SG/ IMPF-become-PRES-3SG to-you call IMPF-hit-PRES-1SG
When she arrives, I will call you.
- b. *bad-e inke kelas-eš tamum be-šav-ad/ #mi-šav-∅-ad, beb-et*
 after-EZ that class-her end IMPF-become.∅.3SG/ IMPF-become-PRES-3SG to-you
zang mi-zan-∅-am
 call IMPF-hit-PRES-1SG
After her class ends, I will call you.

The time of the event in the matrix clause of a *when* clause that contains subjunctive perfective is understood to strictly follow the antecedent event. A progressive verb in the matrix clause is incompatible with subjunctive perfective matrix clauses, as shown in (74a). Only subjunctive imperfective can be used in such case, as in (74b).

- (74) a. # *vaqti Ali res-id, dar-∅-im šam mi-xor-∅-im*
 when Ali arrive.PERF.∅.3SG, PROG-PRES-1PL dinner IMPF-eat-PRES-1PL
When Ali arrives, we will be eating dinner.
- b. *vaqti Ali be-res-ad, dar-im šam mi-xor-∅-im*
 when Ali IMPF-arrive.∅.3SG, PROG-PRES-1PL dinner IMPF-eat-PRES-1PL
When Ali arrives, we will be eating dinner.

The table below summarizes morphological representations of past and present temporal relations in Farsi.¹³

	“Indicative”		“Subjunctive”
	Present	Past	∅-tense
Perfective	raghs- id -∅-am verb- PERF-PRES -1SG	raghs- id -am verb- PERF-PST -1SG	raghs- id -am verb- PERF-∅ -1SG
Imperfective	mi -raghs-∅-am IMPF -verb- PRES -1SG	mi -raghs- id -am IMPF -verb- PST -1SG	be -raghs-am IMPF -verb-∅-1SG
Perfect	raghs-ide ∅-am verb- PP AUX.PRES .1SG	raghs-ide bud -am verb- PP AUX.PST .1SG	raghs-ide baš -am verb- PP AUX.∅ .1SG

Table 3: Morphological representations of tense and aspect in Farsi

4 A situation Semantics for Tense and Aspect

I adopt the framework of situation semantics (Kratzer 2012, 2021). Let us start with the ingredients of Kratzer’s situation semantics:

S : The set of possible situations.

A : The set of Individuals.

\leq : A partial ordering on $S \cup A$, representing the ‘part of’ relation and satisfying the following condition:

- For all $s \in S$ there is a unique $s' \in S$ such that $s \leq s'$ and for all $s'' \in S$, if $s' \leq s''$, then $s'' = s$.

$P(S)$: The power set of S ; the set of propositions.

W : The set of maximal elements with respect to \leq ; the set of possible worlds. (Kratzer 2012: p.117)

¹³While all perfective forms in Farsi share morphological similarities, there are phonological clues that serve to disambiguate among them.

Situations can be related to each other by the ‘part of’ (\leq) relation: situations can have other situations as parts, and be themselves part of other situations. Situations can differ in size. Some situations are maximally big and are not proper parts of other situations (a possible world). The condition on the ‘part of’ relation says that every situation s is related to a unique maximal element, i.e. the world of s . Therefore, situations cannot be part of more than one possible world. Just like Lewis-style individuals, they can be identified across possible world via counterpart relations.

Propositions in this framework can be defined as the characteristic function of a set of situations, i.e. properties of situation. Some situations contain nothing that does not contribute to the truth of a given proposition. These are *exemplifying* situations of a proposition (Kratzer 2021). The notion of *Exemplification* is defined below.

(75) *Exemplification*

A situation s exemplifies a proposition p if whenever there is a part of s in which p is not true, then s is a minimal situation in which p is true.

(Kratzer 2021: p.23)

There are two ways for a situation s to exemplify p : (i) Either p is true in all subsituations of s , or (ii) s is a *minimal* situation in which p is true.

(76) *Minimal situations*

A situation s is a minimal situation in which a proposition p is true ($p(s) = 1$) iff it has no proper parts in which p is true. This is represented with the notation $\downarrow p(s)$.

(Kratzer 2021: p.24)

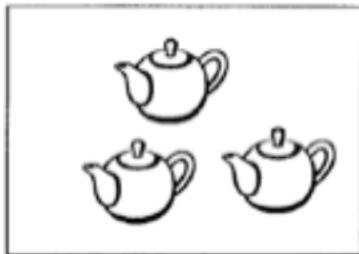
To see the difference between these two different ways, Kratzer (2021) gives the examples in (77).

- (77) a. There are three teapots.
b. There is mud.

(Kratzer 2021)

Situations exemplifying the proposition *there are three teapots* are situations containing three teapot and nothing else. These are *minimal situations* in the sense that they do not have any proper part where this proposition is true. The situation Teapots gives an illustration of a minimal exemplifying situation for the proposition in (77a).

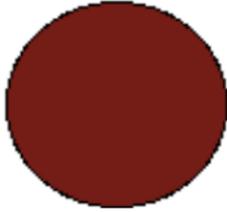
- (78) ‘Teapots’ is a situation that has three teapots and nothing else in it.



(Kratzer 2021: p.25)

In contrast, the situations exemplifying the proposition *there is mud* are situations that contain mud and nothing else, but they are not necessarily minimal situations. The situation Mud gives an illustration of an exemplifying situation for the proposition in (77b).

(79) ‘Mud’ is a situation that consists of mud and only mud.



(Kratzer 2021: p.24)

Kratzer (2021) mentions that there is an important caveat to keep in mind while counting teapots. According to a fundamental principle of counting (Counting Principle), a domain for counting cannot contain non-identical overlapping individuals (Casati & Varzi 1999). ‘*With spatiotemporal objects like teapots, humans seem to rely on counting criteria that privilege maximal self-connected entities (Casati & Varzi 1999, Spelke 1990). A self-connected teapot is one that cannot be split into two parts that are not connected. The maximality requirement prevents counting teapots that are proper parts of other teapots, and the self-connectedness requirement disqualifies sums of parts from different teapots.*

Situations are involved in the semantics of a wide variety of phenomena in natural languages, including tense, aspect and modals. Situation semantics provides a machinery that can unify temporal categories (times and events), and modality (worlds). ‘*Situations are not to be reduced to spatio-temporal locations within a world (indeed, there can be more than one situation in a single spatio-temporal region, and a single situation can include disconnected spatio-temporal parts). However, as parts of what is going on, they have both temporal and spatial coordinates within a world. This is what makes them particularly interesting to us: situations are at the same time temporal (i.e. they are part of some temporal slice within a world), and modal (i.e. they are part of some world and not others)*’ (Arregui et al. 2014: p.311).

4.1 Tense

I will adopt a presuppositional theory of tense (Heim 1994) which takes tenses to introduce presuppositions about the value of a contextually specified parameter. In this approach, tenses are treated as pronouns (Partee 1973). In situation semantics, we can treat tense as introducing a presupposition about the value of a variable that ranges over situations. Thus, tense operates on an aspectual phrase in its scope which contains some situation variable s , and introduces a presupposition about the value of s .

Although I will not adopt a referential theory of tense (Partee 1973), I will maintain its key insight: tenses carry presupposition about the value of a pronoun. Following Kratzer (1998a) and Arregui (2009), I take the inventory of individual pronouns to carry over to situation ones. Both individual and situation pronouns can carry deictic features (presuppositions) that put constraints on their semantic value. In the situation-based theory of tense I adopt, deictic tenses put temporal constraints on the value of situation variables (e.g., Arregui 2009).

The denotations of deictic tenses (present and past) are given below.

- (80) $\llbracket \text{present}_i \rrbracket^g = \lambda P_{\langle s,t \rangle}. \lambda s : \tau(s) \circ \tau(s_i). P(s) = 1$, where s_i is the speech situation by default.¹⁴
- (81) $\llbracket \text{past}_j \rrbracket^g = \lambda P_{\langle s,t \rangle}. \lambda s : \tau(s) \prec \tau(s_j). P(s) = 1$, where s_j and is the speech situation by default.

According to the denotation of present tense in (80), present tense combines with a property of situations $\langle s, t \rangle$ and introduces a presupposition on the domain of the situation variable s such that the temporal slice of s (represented by $\tau(s)$) is presupposed to *overlap with* (represented by \circ) the temporal slice of a free variable s_i and is the speech situation by default. The denotation of past tense in (81) does a similar job, but the constraint it puts on the domain of the situation variable s is that the the temporal slice of s has to *precede* (represented by \prec) the temporal slice of s_i which is the speech situation by default.

It is important to note that the denotation of the Farsi present tense is different from the English present, given in (80). We have seen that present tense in Farsi, unlike English, can freely refer to future events. Giorgi et al. (1997), Klein (1992), Pancheva & Von Stechow (2004) argue that there is cross-linguistic variation in the semantics of present tense. Pancheva & Von Stechow (2004) provide examples in (82) and (83) to illustrate this meaning difference. The ungrammaticality of sentences in (82) shows that English present is not compatible with future temporal adverbs. German present, like Farsi, is perfectly felicitous with future adverbials, as shown in (83).

- (82) a. # Fred is sick in 10 days.
 b. # It {rains/is raining} next week. (Pancheva & Von Stechow 2004)
- (83) a. *Fritz ist in 10 Tagen krank.*
 Fritz is in 10 days sick
 ‘Fritz will be sick in 10 days.’
 b. *Nächste Woche ist das Wetter schlecht.*
 next week is the weather bad
 ‘Next week the weather will be bad.’ (Pancheva & Von Stechow 2004)

Following the proposal made by Pancheva & Von Stechow (2004) regarding the semantics of the present tense in German, I propose that the present tense in Farsi, similarly, conveys a non-past meaning. Translating this insight into the situation semantics, we will have (84) as the semantics of Farsi present tense.

- (84) $\llbracket \text{PRESENT}_i \rrbracket^{c,g} = \lambda P_{\langle s,t \rangle}. \lambda s : \tau(s_i) \preceq \tau(s). P(s) = 1$.

Farsi present tense introduces the presupposition that the minimal temporal slice s belongs to (represented by $\tau(s)$) *overlaps with/follows* the minimal temporal slice that ($g(i) = s_i$) belongs to (represented by $\tau(s_i)$).

There is another kind of pronoun that Kratzer (1998a, 2009) dubbed as *zero pronouns* (\emptyset). Zero pronouns lack deictic features, and depend on an antecedent in order to get their semantic value. Following Kratzer (1998b) and Arregui (2009), I posit that zero tenses do not introduce

¹⁴An alternative is to represent the index i as a variable in the syntax.

any deictic constraint on the situation they refer to. As (85) shows, the denotation of zero tenses is simply an identity function. They do not introduce any presupposition.

$$(85) \quad \llbracket \emptyset \rrbracket^g = \lambda P_{\langle s,t \rangle}. P$$

I propose that the subjunctive clauses in Farsi carry a zero tense. Consequently, they need to be within the c-commanding domain of a deictic tense so that the zero tense can get its semantic value under binding. This explains why subjunctive forms in Farsi do not appear in matrix clauses.

4.2 Aspect

While tense provides information about the temporal location of an situation, aspect is concerned with the structural properties of the situation under discussion. One major account of aspectual categories that is easily translatable into a situations framework is to define them in terms of mereological notions like whole and part (e.g. Verkuyl 1972; Krifka 1992; Filip 1999).

According to Kratzer (2021), Davidsonian events and situations are the same kinds of things. They are both built from relations and individuals involved those relations. She argues that ‘*we don’t seem to need both situation semantics and Davidsonian event semantics*’. Within a situation semantics, Davidsonian events are defined in terms of exemplifying situations.¹⁵ Given the definition of exemplification in (75), the set of exemplifying situations of a proposition must be either homogeneous or quantized (minimal).

- (86) A set of situations is homogeneous iff it is closed under the parthood relation. That is, whenever it contains a situation s , it also contains all (relevant) proper parts of s .
- (87) A set of situations is quantized iff it doesn’t contain both a situation s and a proper part of s . (Kratzer 2021: p.29)

The algebraic notions of homogeneity and quantization have been argued to capture grammatical and lexical aspectual distinctions (Krifka 1992). Kratzer (2021) illustrates this with the examples below.

- (88) a. Josephine built an airplane.
 b. Josephine flew an airplane. (Kratzer 2021: p.29)

Kratzer (2021) argues that the proposition expressed by (88a) is exemplified by *minimal* past situations in which Josephine built an airplane. This set of situations is quantized. The proposition expressed by (88b), on the other hand, is exemplified by all past situations that contain airplane flying by Josephine and nothing else. This set of situations is homogeneous (Kratzer 2021: p.29). It should be noted that (88b) is true only of situations exemplifying the proposition expressed by Josephine flew an airplane that do not lead to a violation of the Counting Principle. That is, it is true of maximal self-connected situations exemplifying the proposition expressed by Josephine flew an airplane.

I follow Cipria & Roberts (2000) in adopting a situation semantic without explicit quantification over events in the object language. Taking events to be exemplifying situations (Kratzer

¹⁵An event is a property of a spatiotemporal region (Lewis 1986)

2021), aspect will combine with a property of situations expressed by VP and introduces structural constraints on its exemplifying situations. Perfective aspect restricts the set of situations exemplifying the proposition expressed by its embedded VP to quantized minimal situations. Imperfective aspect, on the other hand, specifies that the set of situations exemplifying the proposition expressed by its embedded VP is a homogeneous set. A similar idea has been proposed by Deo (2020). She proposes that sentences with imperfective aspect denote temporal predicates with the subinterval property. In contrast, perfective aspect is taken to mark the presence of anti-subinterval property.

I propose (89) as the denotation of perfective aspect, according to which perfective aspect combines with a property of situations and results in a property of situations. What perfective aspect adds is that situations exemplifying the proposition denoted by the embedded VP are quantized or minimal situations.¹⁶

$$(89) \quad \llbracket \text{PERFECTIVE} \rrbracket^{c,g} = \lambda P_{\langle s,t \rangle}. \lambda s. P(s) = 1 \ \& \ \forall s' [s' \leq s \ \& \ P(s') = 1 \rightarrow s' = s]$$

Since statives will always have subparts that exemplify the proposition, they are correctly expected to be incompatible with

I follow Arregui et al. (2014), Cipria & Roberts (2000) in taking imperfective aspect to introduce a universal quantifier over situations. Under this analysis, the modal properties of imperfective aspect are organically derived. Arregui et al. (2014) argue that a modal analysis of imperfective aspect can account for cross-linguistic variations in the interpretation of imperfective in terms of variation in modal bases. In (90), I propose a modification to this modal analysis such that the universal quantifier comes from the homogeneity of exemplifying situations. The contextual relation R in (90) does the job of modal bases in the account proposed by Arregui et al. (2014). The set of situations s' that are proper part s , can further be restricted by contextually supplied modal restrictions.

$$(90) \quad \llbracket \text{IMPERFECTIVE} \rrbracket^{c,g} = \lambda P_{\langle s,t \rangle}. \lambda s. \forall s' [s' \leq s \ \& \ \underbrace{\text{there exists a contextually salient relation } R \text{ such that } R(s)(s')}. \rightarrow P(s') = 1]$$

According to (90), imperfective aspect combines with a property of situations and returns a property of situations. It adds that the proposition denoted by VP is exemplified by all the relevant sub-situations of the topic situation s specified by the contextual parameter R . In this sense, imperfective aspect marks that the set of exemplifying situations is homogeneous. The wide range of interpretations cross-linguistically associated with imperfective aspect such as ongoing, generic, and habitual readings can be captured via different values the contextual relation variable R can take. In the case of habitual sentences, for instance, the contextual relation R restricts the domain of quantification to characteristic sub-situations of the topic situation (Arregui et al. 2014, Cipria & Roberts 2000).

Strictly speaking, the denotation of imperfective in (90) is compatible with cases where the situation exemplifying a given proposition is a quantized one. When $s' = s$, it is true that for

¹⁶I will summarize the denotation of perfective aspect as given below, where \downarrow represents quantized situations (i.e. $\forall s' [s' \leq s \ \& \ P(s') = 1 \rightarrow s' = s]$).

$$(1) \quad \llbracket \text{PERFECTIVE} \rrbracket^{c,g} = \lambda P_{\langle s,t \rangle}. \lambda s. \downarrow P(s) = 1$$

all situations s' that has a “part of” relation with s (where $R(s)(s')$ is an identity relation), $P(s')$ holds true. In other words, the denotation of imperfective entails that of perfective but the reverse entailment relation does not hold. Given the Gricean maxim of quantity, which requires participants to be maximally informative, the use of a weaker alternative implies that the speaker believes the stronger alternative does not hold true. In other words, there is at least some $s' \leq s$ such that $s' \neq s$ and $P(s') = 1$.¹⁷

Let us now sketch how the progressive aspect is treated in a situations framework with no events. I take progressive aspect, which embeds an imperfective aspect in Farsi as shown in (18), to add a linguistically encoded modal restriction to the semantics of imperfective. The modal restriction encoded in the denotation of progressive is taken from the definition of *Event-inertia* modal base by Arregui et al. (2014).

$$(91) \quad \frac{\llbracket \text{PROGRESSIVE} \rrbracket^{c,g} = \lambda P_{\langle s,t \rangle}. \lambda s. \forall s' [s' \leq s \ \& \ \exists s'' : s' \leq s''. \ s' \text{ continue in } s'' \text{ as they would if there were no interruptions.}]}{\rightarrow P(s'') = 1}$$

The denotation given in (91) asserts that for every relevant sub-situation s' of the topic situation s there is a situation s'' in which s' continues as if there were no interruption, and the proposition P is exemplified by s'' . The *Event-inertia* (or inertia-situations in terminology of Cipria & Roberts (2000)) serves to account for the *imperfective paradox*, illustrated by the example (92) in which an event of a dog crossing the street was in progress at a past topic situation but remains incomplete. The intuition is that there was something happening that, in normal circumstances, would lead to a situation that exemplifies the proposition *a dog crossed the street*.

- (92) *An sag dašt az khiaban rad mi-shod ke ba otobus*
 that dog AUX.PST.3SG from street pass IMPF-become.PST.3SG that with bus
tasadof kard.
 accident do.PERF.PST-3SG
As the dog was crossing the street, it was run over by a bus.

The denotation in (91) is similar to the semantics that Hallman (2009) has proposed for progressive. Like Hallman’s proposal, the denotation proposed here is a version of Portner (2011) calls the *event structure theory* of the progressive (Hinrichs 1983, Ter Meulen 1985, 1987, Bach 1986, Link et al. (1987), Parsons 1990, and Krifka 1992), which also maintains aspects of the *modal theory* of progressive (Asher 1992, Bonomi 1997, Dowty 1977, 1979, Landman 1992, and Portner 1998).

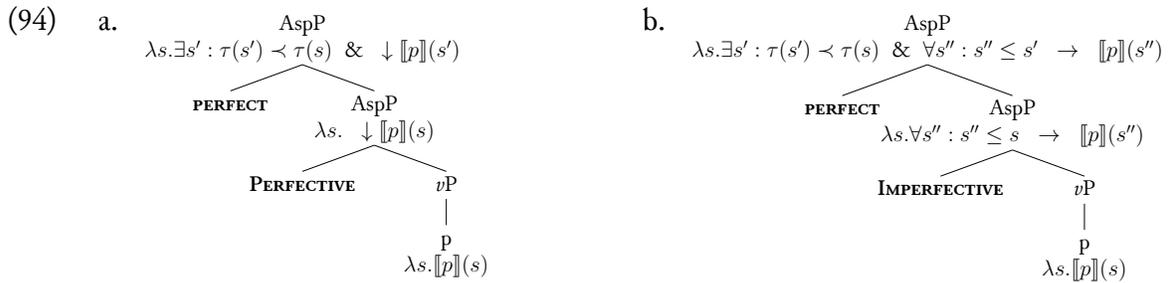
Note that this proposal characterizes the imperfective as a default aspect, with weak truth conditions that are, in principle, compatible with both perfective and progressive readings. However, the use of the imperfective aspect in situations where a stronger alternative, such as the progressive aspect, is available implies that the stronger alternative is false. In other words, the relation R is not in accordance with what is described by the *Event-inertia*.

¹⁷This explains why imperfective aspect is compatible with completed telic eventualities, as illustrated in the example (17). The implicature that only arises in cases where both alternatives are otherwise available. Since the present perfective has a very limited use and the present imperfective is the only felicitous alternative in this context, no implicature is generated.

What about the perfect aspect? There is a huge body of literature on variation in the interpretation of perfect across and within languages (Iatridou et al. 2003, McCoard 1978, Pancheva & Von Stechow 2004, Portner 2003, among others). Addressing the complexities of perfect is outside of the scope of this paper. Here, inspired by Alonso-Ovalle (2002) and Arregui (2007), I provide a denotation of perfect in a situations framework.

$$(93) \quad \llbracket \text{PERFECT} \rrbracket^{c,g} = \lambda P_{\langle s,t \rangle}. \lambda s. \exists s'. \text{Result}(s)(s') \ \& \ \tau(s') \prec \tau(s) \ \& \ P(s') = 1$$

Perfect aspect combines with a property of situations and results in a property of situations. It introduces a situation (result state) that holds after the proposition denoted by the c-commanded VP is exemplified. Whether the exemplifying situations for the embedded VP property are quantized or homogeneous is determined by the lower aspect head which can be either perfective or imperfective. This is represented in the structures below.



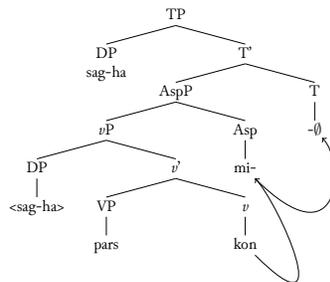
Against this backdrop, I will now demonstrate how we can systematically derive the truth conditions of Farsi sentences from the given denotations.

4.3 Deriving truth conditions of indicative and subjunctive sentences

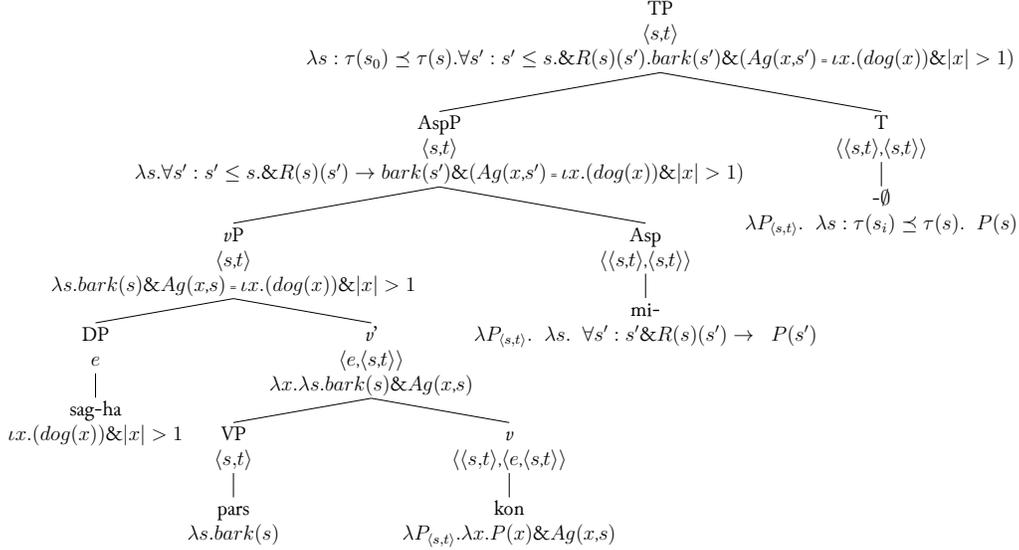
Let us start with present and past imperfective sentences. Consider again the present imperfective sentence in (8), repeated here in (96a). Putting the semantics of the present tense and the imperfective aspect together, we will have (96b) and (97) as its LF and truth conditions.¹⁸

¹⁸To achieve the order of morphemes, I follow Darzi & Anosheh (2010) to take Farsi to be head-final in verbal projections, and to posit that the verb undergoes total head-movement, that is V moves through each functional head until it reaches the highest functional projection¹⁹.

(95)



- (96) a. *sag-ha pars mi-kon-∅-and*
 dog-PL bark IMPF-do-PRES-3PL
Dogs bark.
 b. LF for (96a)



- (97) $[_{\text{TP}} \text{PRESENT}_i [_{\text{ASPP}} \text{IMPERFECTIVE} [_{\text{VP}} p]]]$
 a. $\llbracket \text{dogs IMPF-bark-PRES} \rrbracket^{c,g} = \lambda s : \tau(s_0) \preceq \tau(s). \forall s' [s' \leq s.$
 $\& s' \text{ is a characteristic part of } s \rightarrow \text{bark}(s') \& (Ag(x, s') = \iota x. (\text{dog}(x)) \& |x| > 1)]$

The truth conditions above state that the contextually salient situation s whose temporal slice overlaps or follows the temporal slice of the speech situation is such that all situation s' that are characteristic part of s are situations that exemplify the proposition ‘*dogs bark*’. The contextually salient situation s is the sum of all (possibly scattered) situations s' in which dogs bark. Consequently, it follows that the temporal slice of this rather large situation, while overlapping with the temporal slice of the speech situation, might have parts that precede or follow it.²⁰

The LF and the truth conditions of past imperfective sentences are derived in a similar way. The only difference is that the temporal slice of the contextually salient situation s precedes the temporal slice of the speech situation.

- (98) *dainasor-ha gušt mi-xor-d-and*
 dinosaur-PL meat IMPF-eat-PST-3SG
Dinosaurs ate meat.

²⁰Note that our purely situational treatment of imperfective aspect still captures the Neo-Reichenbachian notion of the imperfective aspect, wherein the denotation of the imperfective aspect states that the time t' is *contained within* the ‘temporal trace’ of an event/state of P.

(1) $\llbracket \text{IMPF} \rrbracket = [\lambda P_{\langle v, t \rangle}. [\lambda t'_i. \exists e. t' \subseteq (e) \& P(e) = T]]$

- (99) $[_{\text{TP}}\text{PAST} [_{\text{ASPP}} \text{IMPERFECTIVE} [_{\text{VP}} p]]]$
 a. $[[\text{dinosaur meat IMPF-eat-PST}]^{c,g} = \lambda s : \tau(s) \prec \tau(s_0). \forall s' [s' \leq s.$
 $\& s' \text{ is a characteristic part of } s \rightarrow \text{eat}(s') \& (\text{Theme}(y,s') \& \text{meat}(y)) \& (\text{Ag}(x,s') =$
 $\iota x. (\text{dinosaur}(x)) \& |x| > 1]]$
- (100) $[_{\text{TP}}\emptyset [_{\text{ASPP}} \text{IMPERFECTIVE} [_{\text{VP}} p]]]$
- (101) $[[\text{dinosaur meat IMPF-eat-PST}]^{c,g} = \lambda s. \forall s' [s' \leq s.$
 $\& s' \text{ is a characteristic part of } s \rightarrow \text{eat}(s') \& (\text{Theme}(y,s') \& \text{meat}(y)) \& (\text{Ag}(x,s') =$
 $\iota x. (\text{dinosaur}(x)) \& |x| > 1]]$

As I discussed earlier, I take perfective aspect to specify that situations exemplifying the embedded proposition are minimal situations. Putting the semantics of past tense and perfective aspect together, we will have (102) as the semantics of past perfective in Farsi.

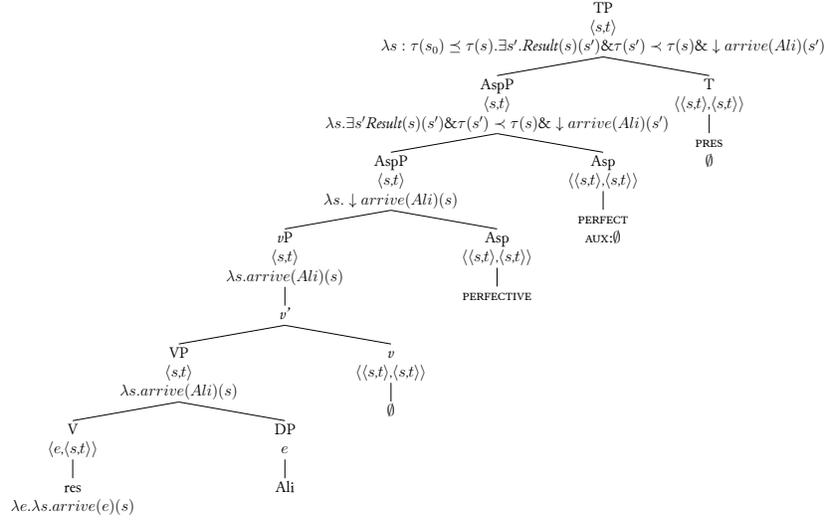
- (102) $[_{\text{TP}}\text{PAST} [_{\text{ASPP}} \text{PERFECTIVE} [_{\text{VP}} p]]]$
 $[[\text{Zahra raf-t}]^{c,g} = \lambda s. \tau(s) \prec \tau(s_0). \downarrow \text{left} (\text{Zahra})(s)$

The truth conditions above state that the contextually salient situation s whose temporal slice precedes the temporal slice of the speech situation is a minimal situation in of *Zahra leaving*.

As we have seen, despite the non-past semantics of present tense in Farsi, we can still see a trace of the present perfective paradox in the language. This is evident in the limited use of the present perfective in contexts where the event is going to be completed in the imminent future. The proposed semantics of perfective aspect offers an explanation for this observation. In contrast to the built-in modality of the imperfective and perfect aspects, which respectively involve universal and existential quantification over situations, the perfective aspect directly refers to a minimal situation (Arregui 2007). The referential non-modal semantics of the perfective is incompatible with future statements that involve some form of modality (Condoravdi 2001, Copley 2009, Enç 1996, Huddleston 1995, Klecha 2014, Thomason 1970, among others).

Now let us consider the LF and truth conditions of the present perfect sentence (103a). As I mentioned, perfect aspect is a higher aspectual head, and whether or not the embedded proposition is exemplified by quantized or homogeneous situations is determined by the lower aspectual head. Since imperfective aspect has an overt morphological realization, its absence in (103a) implies the presence of perfective aspect.

- (103) a. *Ali reside ast.*
Ali arrive.PP AUX.PRES.3SG
Ali has arrived.
- b. LF for (103a)



(104) $\llbracket \text{Ali reside ast} \rrbracket^{c,g} = \lambda s : \tau(s_0) \preceq \tau(s). \exists s'. Result(s)(s') \& \tau(s') \prec \tau(s) \& \downarrow arrive(Ali)(s')$

According to the truth conditions above, the sentence (103a) is true iff the temporal slice of the contextually salient situation s overlaps or follows the temporal slice of the speech situation s_0 , and there is a situation s' whose temporal slice precedes the temporal slice of the result situation s and s' is a minimal situation of *Ali arriving*.

The truth conditions of an analogous sentence with past perfect (105) in Farsi are illustrated in (106). The only difference here is that the temporal slice of the contextually salient result situation s precedes the temporal slice of the speech situation s_0 .

- (105) *Ali reside bud.*
 Ali arrive.PP AUX.PST.3SG
Ali had arrived.

(106) $\llbracket \text{Ali reside bud} \rrbracket^{c,g} = \lambda s : \tau(s) \prec \tau(s_0). \exists s'. Result(s)(s') \& \tau(s') \prec \tau(s) \& \downarrow arrive(Ali)(s')$

Finally, let us briefly discuss how the truth conditions of sentences that embed a subjunctive clause are derived. As previously discussed, subjunctive forms indicate the presence of a zero tense in the structure. The temporal interpretation of the subjunctive clause is determined by the matrix tense and the aspectual properties of the embedded clause. Consider the examples (107) and (108).

- (107) *Reza fekr mi-kard ke Ali diruz/emruz/farda be-rav-ad.*
 Rez thought IMPF-do.PST.3SG that Ali yesterday/today/tomorrow IMPF-go- \emptyset -3SG
 ‘Reza thought that Ali would leave yesterday/today/tomorrow.’
- (108) *Reza fekr mi-kon- \emptyset -ad ke Ali diruz/ta-farda rafte baš-ad*
 Reza thought IMPF-do.PRES.3SG that Ali yesterday/by-tomorrow go-PP AUX. \emptyset -3SG
 ‘Reza thinks that Ali has left yesterday.’

The truth conditions of these sentences are given in (107) and (110).

- (109) $\lambda s : \tau(s) \prec \tau(s_0). \forall w [w \in \text{Dox}(\text{Reza}, s) \rightarrow \exists s' [s' \leq w \ \& \ \forall s'' [s'' \preceq s' \ \& \ R(s'')(s') \rightarrow \text{leave}(\text{Ali})(s'')]]]]$
- (110) $\lambda s : \tau(s_0) \preceq \tau(s). \forall w [w \in \text{Dox}(\text{Reza}, s) \rightarrow \exists s' [s' \leq w \ \& \ \exists s'' : \text{Result}(s')(s'') \ \& \ \tau(s'') \prec \tau(s') \ \& \ \downarrow \text{leave}(\text{Ali})(s'')]]$

According to (109), the sentence (107) is true iff and only if in all possible worlds compatible with Reza's beliefs in the contextually salient situation s whose temporal slice precedes that of the speech situation, there exists a situation s' such that all the relevant sub-situation of s' are situations that exemplify the proposition *Ali leaves*.

The truth conditions in (110) state that in all possible worlds compatible with Reza's beliefs in the contextually salient situation s whose temporal slice overlaps or follows that of the speech situation, there exists a situation s' that is a result of the situation of s'' and the temporal slice of s'' precedes that of the result situation s' and s'' is a minimal situation of *Ali leaving*.

Note that there is no temporal restriction on the embedded propositions. The "not-earlier-than the time of matrix event" interpretation associated with the imperfective subjunctive can be attributed to pragmatic interactions with the perfect form, which encodes a temporal precedence relation. This is exemplified by the example in (111b), wherein the stative predicate in the embedded clause, namely *know*, exclusively compatible with the imperfective aspect, does not impose such a temporal constraint.

- (111) a. *Context: Ali took part in a trivia competition three days ago, and lost because he didn't know the answer to a question about music. The following day, Maryam, who had observed the competition, was talking to Reza about the event. She brought up the challenging question that stumped Ali and asked Reza to guess whether Ali knew the answer. Reza, holding a high opinion of Ali's music knowledge, was sure that Ali knew the correct answer.*
- b. *Reza fekr mi-kard ke Ali javab-e soal ro*
 Rez thought IMPF-do.PST.3SG that Ali answer-EZ RA IMPF-know-Ø-3SG
be-dan-ad.

'Reza thought that Ali knew the answer.'

5 Conclusion

This paper posits that the traditionally called *subjunctive mood* in Farsi signals the presence of a zero tense. It argues that like their indicative counterparts, the three subjunctive forms in Farsi are distinguished based on their aspectual properties. Following an examination of the distributional pattern and the interpretation of tense and aspect in Farsi, the paper demonstrates that the truth conditions of sentences in Farsi can be derived from the situation-based semantics of tense and aspect proposed herein.

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