

Modality in Makkan Arabic:

The interaction between modals and aspect

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Abstract

This dissertation explores the interaction between modality and aspect in Makkan Arabic (MA). There is some consensus in the semantic literature regarding the treatment of modal expressions that may obtain various flavours, such as epistemic, deontic, bouletic, ability, necessity or teleological. These various modal flavours can be captured by a unified lexical entry, and are identified by contextual factors Kratzer (1977, 1981, 1991, 2012). There is some debate regarding the structural location of modal elements, some of which have been argued to be high (the case of epistemic modals) and others low (the case of root modals) (e.g. Cinque (1999)). The relative scope of modals has been subject of much recent work on modality, in particular in relation to their interaction with temporal categories such as aspect. This thesis investigates this topic on the basis of novel data from MA.

I observe that the flavour of modality can change depending on how it is inflected with different types of aspect in MA. This observation is in line of Hacquard; Hacquard; Hacquard's (2006; 2009; 2014) proposal for French and Italian. In MA, when the root modal *\gdr* "can" is inflected with the perfective, the combination yields entailments that have come to be known in the literature as 'actuality entailments' (AEs) (see Bhatt (1999, 2006)). In this case, the speaker gives rise to the inference that the proposition expressed by the complement holds in the actual world (instead of merely in some possible but not actual world). My thesis integrates the case of *\gdr* to current cross-linguistic debates on this topic. Building on Hacquard's work, I argue that AEs are generated when perfective aspect scopes over root modals. Perfective aspect links events to the actual world. Imperfective aspect scoping over the modal fails to generate AEs. My thesis ex-

tends the investigation of AEs to non-perfective cases. I argue that in addition to the contrast between perfective and imperfective, MA also distinguishes perfect aspect (e.g. an auxiliary plus a modal participle like *gaadir*). I suggest that the perfect in MA has several shapes, including the choice between two auxiliaries: *kaan* and *saar*. I link the different shapes of the perfect to the different types of interpretation identified by Portner (2000, 2003) for the English perfect. I suggest that in MA, different forms of the perfect are linked to distinct interpretations (which in English are grouped together under one form). In addition I show that, contrary to what has been argued by Hacquard for French, the perfect in MA can give rise to AEs in the case of the *saar* auxiliary. I develop an analysis of the *saar* perfect that is inspired by Hacquard’s proposal for perfective: in the case of *saar*, contrary to *kaan*, the perfect links the eventuality to the actual world. While the discussion of AEs in relation to the modal $\backslash gdr \backslash$ are linked to the proposal that aspect scopes over the modal, I also examine the case of a modal expression that scopes over aspect: *qad* “might”. I show that in spite of the fact that aspect scopes below the modal, the contrast between perfective and imperfective in the embedded clause can still give rise to differences in the generation of AEs. This case is interesting because much previous literature on AEs has focused on languages in which aspect scopes over the modal. MA *qad* provides an example where the modal scopes over aspect, and it is still the case that AEs appear to be generated. In spite of the structural differences with $\backslash gdr \backslash$, my analysis of *qad* builds on Hacquard’s proposal for AEs with the perfective, appealing to her proposal for the ‘preservation of event description’ to account for the fact that properties of eventualities can remain stable across worlds.

The structure of the thesis is as follows: *Chapter 1* provides an introduction to the empirical domain, situating aspect and modality in the description of MA; in addition it

provides an introduction to key theoretical concepts to be used in later chapters. *Chapter 2* discusses AEs in the case of the root modal $\backslash gdr \backslash$, comparing perfective and imperfective. *Chapter 3* extends the discussion of the modal to examples with the perfect, distinguishing between the *kaan-* and *saar-* perfects. *Chapter 4* investigates the behaviour of *qad* and its interaction with perfective and imperfective complements. *Chapter 5* offers a brief summary and concluding remarks.

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Dedication

To Asem and my children

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List of abbreviations

VP	Verb Phrase
DP	Determiner Phrase
IMPFV	Imperfective aspect
PFV	Perfective aspect
PF	Perfect aspect
Fut.	Future
Adj.	Adjective
SG	Singular
PL	Plural
1	First person
2	Second person
3	Third person
F	Female
M	Masculine
ʔ	Glottal stop
ħ	Voiceless pharyngeal fricative
ʕ	Voiced pharyngeal fricative
ɣ	Voiced velar fricative
ð	Voiced interdental fricative
x	Voiceless velar fricative

Chapter 1

Descriptive overview of MA aspect and modals

1.1 Introduction

This dissertation investigates the interaction between aspect and modality in Makkan Arabic (MA). It argues that aspect presents an interesting interaction with modality. It makes a contribution to the growing literature that investigates aspect and modality from a cross-linguistic perspective. The picture that emerges is that, expanding on what has been suggested by the classical literature, aspect and modality interact in interesting ways. The thesis explores the contrast between perfective and imperfective aspects and the interpretations of two modals: *\gdr* “can” (a verbal modal) and *qad* “might” (a semi-modal).

The data that will be analyzed is from MA. MA is a colloquial urban Arabic that is spoken in Makkah city located in the western region of Saudi Arabia, which is known as Hijazz. Based on the last report by Saudi Census in 2015, Saudi Arabian population of MA native speakers is 855,805. It is important to highlight that it is very likely that we would find the same phenomena in other regions of Hijazz and other regions of Saudi

Arabia. However, my research and findings in this dissertation are based on MA.

There are two main reasons to study MA. One is that, contrary to Standard Arabic, it is a living, spoken language. It is possible to construct scenarios to probe subtle details of native speakers' intuitions. The other main reason is the hope that the cross-dialectal study of the interaction between tense, aspect and modality in Arabic will lead to a better understanding of the phenomena. The relatively small differences between dialects could help us better understand the building blocks of the construction of modal meanings. My thesis contributes to this project with the study of MA.

This thesis addresses specific questions regarding the interaction of tense, aspect and modality. For example, do certain combinations of aspect and modals lead to the cancellation of modal meaning? These effects are known in the literature as Actuality Entailments (AEs). Does MA have a perfect? Does this affect the interaction with modals? In what follows is a small preview of my main results(see the thesis outline in Section 1.6). First, the MA root modal *\gdr* maintains its modal component after being linked with the perfective and yields AEs. I argue that AEs arise due to the structural height between the perfective and the root modal in line to Hacquard's (2006; 2009; 2014) proposal for French and Italian (see Chapter Two for further details). Second, I claim that the MA aspectual system should be extended to include two types of perfect, lexically encoded by the presence of auxiliaries: *kaan* versus *šaar*. I further argue that a participle modal *gaadir* of the MA root modal *\gdr* can combine with the above auxiliaries, and the result of this combination leads to interesting semantic consequences relative to AEs (a novel observation in this dissertation). Finally, my investigation reveals evidence that the MA particle *qad* has multiple flavours depending on the types of aspect. I focus on those interpretations in which *qad* appears to have an epistemic flavour. My research establishes

a new connection between the epistemic *qad* with the perfective (also a novel observation of this dissertation). I further offer a formal account where the modal *qad* reflects a high degree of epistemic certainty when associated with the perfective.

The rest of this chapter offers an overview of key data and theoretical background. It is structured as follows. I start the discussion by describing MA verbal morphology in Section 1.2. I describe the interpretations of the MA imperfective and perfective. In addition, I show the agreement morphology on a regular MA verb with its subject DP for each type of aspect. I also talk about a derived form of MA regular verbs, the ‘participle form’. This participle form has interesting semantic consequences in a modal context. Afterwards, I describe MA modal data with respect to root and epistemic modals in Section 1.3.

Following the descriptive discussion of MA aspect and modals, I present Kratzer’s (1998) proposal for tense and aspect, as in Section 1.4. I adopt Kratzer’s proposal to compute MA simple sentences with imperfective and perfective, as illustrated in Section 1.4.1. In Section 1.5.1. I show Kratzer’s (1981; 1991; 2012) account of an English modal. Finally, I follow her proposal to compute MA modal sentences in Section 1.5.2. The application of Kratzer’s modal system will be amended to capture the novelty of MA data later in this dissertation (see Chapters 2, 3 and 4).

1.2 Descriptive overview of the MA verbal morphology

In this section, I describe three sets of facts about MA data. They are matrix clauses, types of aspect and derived forms of MA verbs. The goal of this description is to offer an overview of the MA system, so the reader can understand MA data presented across chapters of this dissertation. This description is built on the literature of Standard Arabic (SA) descriptive grammar reported in Classical and Modern literature by Al-Kuwari

(2011); Al-Muradi (1992); Al-Gilaanie (2009); Wright (1964); Wightwick (2017); Ryding (2005); Hassanein (2006); a.o.

My investigation about MA grammar shows that MA does not diverge from the basic facts reported on SA. In what follows, I start by explaining types of MA simple sentences in the matrix clause. Afterwards, I talk very briefly about types of aspect. (I discuss in details MA aspectual system in Section 1.2.1 and Section 1.2.2 in this chapter.) Later, I present the various derived forms of MA verbs. So, let us begin the discussion with the first fact about MA grammar, which concerns MA matrix clauses.

In MA simple intransitive matrix clauses; a sentence includes a ‘subject’, which is a DP, and a verb, as illustrated with *saafar* “he travelled” in (1).

- (1) ʔasem saafar.
 Asem travel.3.SG.M.PFV.
 ‘Asem travelled.’ (MA: SV)

The word order of the above example is SV order, where the DP precedes the verb. Example (1) can also have an alternative word order, as shown in (2).

- (2) saafar ʔasem.
 travel.3.SG.M.PFV. Asem
 ‘Asem travelled.’ (MA: VS)

Note that MA has several word orders, such as SV, SVO or OVS. (I will not discuss these various word orders as they are outside the scope of this dissertation.) An example with a direct object is given in (3).¹

- (3) ʔasem katab t-taqreer.
 Asem write.3.SG.M.PFV. the-report
 ‘Asem wrote the report.’ (MA: SVO)

¹For more discussion regarding Arabic word order, the reader may refer to the following works by Benmamoun (2000); Mohammad (2000); a.o.

Some MA matrix clauses are ‘verb-free’. They do not have a content verb, but rather an auxiliary copula verb and a noun. If the speaker wants to refer to a past time (e.g. *Asem was a student* in the past), an auxiliary *kaan* is added, as shown in (4). It must be perfective.

- (4) ʕasem kaan ʕaalib fi ʕamiʕat Ottawa.
 Asem kaan.3.SG.M.PFV. student at University Ottawa
 ‘Asem was a student at University of Ottawa.’² (MA)

This auxiliary is silent with so-called imperfective sentences, as shown in (5). The claim is that Asem is a student.

- (5) ʕasem ʕaalib fi ʕamiʕat Ottawa.
 Asem student at University Ottawa
 ‘Asem is a student at University of Ottawa.’ (MA)

In (5), the sentence does not have a content verb compared to Example (1), but rather a silent auxiliary. This auxiliary is visible in past sentences, as stated by Al-Balushi (2011); Aoun, Benmamoun & Choueiri (2010); Bahloul (2008); a.o. The auxiliary *kaan* has to agree in gender, number and person with its specifier as illustrated in (4). In addition, the auxiliary *kaan* can be combined with a verb or a modal, and the result of this combination leads to interesting semantic consequences. (I will expand the discussion of the auxiliary *kaan* in verb-sentences and in modal-sentences in Chapter 3 of this dissertation.)

In the above examples, I have illustrated two types of MA sentences in matrix clauses: ‘verb-sentences’ and ‘verb-free sentences’. My focus will be on ‘verb-sentences’ in this dissertation.

Next, I turn the discussion to the second fact of the MA grammar, which is the aspectual system. As a starting point, I will adopt the view that MA aspectual system involves

²I use the imperfective (IMPRFV) in the gloss because there is present reference (see the discussion below)

an imperfective and a perfective aspect. This does not diverge from the consensus reported on Standard Arabic in the literature of Classical Arabic Grammar (Al-Kuwari, 2011; Al-Muradi, 1992; Al-Kuwarie, 2009; Wright and Caspari, 1964), and Arabic linguistics (Aoun et al., 2010; Bahloul, 2008; Benmamoun, 1999, 2000; Fassi Fehri, 1993, 2003; Hallman, 2015; Ryding, 2005; Wright and Caspari, 1964; Wightwick, 2017; Hassanein, 2006). I will offer detailed discussions about the interpretations of MA imperfective in section 1.2.1. and MA perfective in Section 1.2.2. in this chapter.

Before I begin the discussion of the MA aspect, I should emphasize that there will not be a separate section describing MA tense here. The reason for focusing descriptively on MA aspect is based on the claim that Standard Arabic does not differentiate between tense and aspect morphologically (Comrie, 1976; Benmamoun, 2000; Fassi Fehri, 1993, 2003, 2012). In principle, present tense is always linked to imperfective aspect while past tense is always anchored to perfective aspect. In spite of this morphological conflation, tense—as a category—is structurally generated above aspect phrase, parallel to English (Benmamoun, 2000), and this has been also reported by Fassi Fehri (2012), as illustrated in (6).

- (6) Granted that the PT/ST opposition expresses a mixed combination of *t* and *Asp*, and having indicated that *Asp* is merely associated with *T* (rather than being the value of the mentioned opposition), I would like to corroborate this view by showing how the system is oriented, from top (Tense) to bottom (Aspect), rather than the other way around.³ (Fassi Fehri, 2012, pp.22-23)

Even though this section describes intuitions that have traditionally been linked to the

³PT stands for a prefixed tense and ST stands for a suffixed tense. It is, in fact, a distinction between present and past tenses.

category of ‘aspect’, I am actually looking at the morphological conflation of tense and aspect.

One way to determine the location of an event more precisely relative to reference time is through the use of adverbs. This strategy is common in Standard Arabic (SA), as in (7) and (8). Comrie (1976) also points out that the use of adverbs is widely reported in languages lacking the morphological distinction between tense and aspect. Let us see Examples (7) and (8) from SA, which illustrates this adverbial use.

- (7) kataba r-risaalat-a ?amsi.
wrote-3 the-letter-ACC. yesterday
write.PFV.-3.SG.M. the-letter-ACC. yesterday⁴

‘He wrote the letter yesterday.’ (Fassi Fehri, 2012, p.6)

- (8) y-abnii d-daar-a l-?aan-a.
3-build the-house-ACC. now
3.SG.M.-build.IMPFV. the-house-ACC. now

‘He is building the house now.’ (Fassi Fehri, 2012, p.6)

MA speakers also follow the same strategy to determine the location of the event with respect to the reference time, which will see in the following Section 1.2.1. for the imperfective and Section 1.2.2. for the perfective. These sections will provide a thorough description about the interpretations of the imperfective and the perfective.

From the above discussion, I have briefly discussed about the MA aspectual system, and the two basic categorizations of aspect: the imperfective and the perfective. Now, I conclude this introductory section with a third fact about MA. I will talk briefly about the various derived forms of MA verbs in an active voice. Like Standard Arabic (see the above cited works), MA verbs follow a derivational strategy. (In a derivational system, a

⁴The detailed glossing line is provided for all Fassi Fehri’s examples in (7) and (8). The re-glossed examples go in line with our glossing across MA examples.

word has a ‘root’, which expresses its core meaning.)

In MA, the derivational morphology is predominantly non-concatenative⁵. The MA root word is identified by three consonants, such as d/r/s. This tri-consonantal word expresses the meaning of studying, as shown in (9) (for example), but it can have predictable derived forms or “patterns”, as illustrated from (a) to (d).

(9) *faʕal* pattern: *daras* “he studied”

a. ‘yafʕul’ pattern : *yadrus* “he studies”

b. ‘faaʕil’ pattern: *daaris* “he has studied”

c. ‘fiʕaala’ pattern: *diraasa* “study”

d. ‘mafʕala’ pattern: *madrasa* “school” (MA)

The result of the derivation produces a definite number of “patterns” to invoke a new form. These are predictable patterns, (the basic pattern is *faʕal*), and there are other possible fourteen patterns. (I will not talk about the other patterns in this chapter since they are outside the scope of this dissertation.) Each pattern represents a derived form of the root. The derived form generates various modified interpretations of the root’s core interpretation in addition to the extra meaning linked with the pattern itself.

An important focus for the reason in this thesis is on a root modal similar to English ‘can/could’. Its skeleton is composed by three consonants *\gdr*. Aspectual differences are made by a variation in the pattern of vowels and predictable patterns. For the imperfective, the root is inflected with a prefix (*yi-* or *yu-*) and has the following patterns:

⁵The description of the MA as a non-concatenative system is analogical to the description for Standard Arabic Matthews (1991) and for Palestinian Arabic (2016).

-CCiC, -CCuC or -CCaC. For the perfective, on the other hand, the patterns are: CaCaC or CiCiC. Accordingly, *gidir* “managed to” is the perfective pattern, while *yigdar* “he is able to” is the imperfective⁶.

In addition to the perfective (basic) and imperfective (a) patterns, I will also discuss the *faaʕil* form, as in (b). This form is known as a ‘participle’ of the verb with a *faʕal* pattern. In Section 1.2.3, I will describe the Arabic participle (with focus on MA participles). I will illustrate its function in MA matrix clauses. At a later point of this dissertation (in Chapter 3), I aim to account for the semantics of the MA modal in a participle form.

So far, I have illustrated three facts about MA. I have discussed the way to construct a simple sentence, the MA aspectual system and the MA derivational system. In what follows, I will expand the discussion on the MA aspect and the MA participle form. These two topics are core ingredients for the relative interaction between MA modals and aspect across chapters of this dissertation.

The next sections are structured as follows. I start the discussion with imperfective aspect in Section 1.2.1. I explain in detail possible interpretations of the MA imperfective. Later, I describe agreement morphology that takes place between a matrix imperfective verb and its DP in Section 1.2.1.2. Afterwards, I describe perfective aspect in MA in Section 1.2.2. In Section 1.2.2.1, I illustrate the interpretation of the MA perfective, and then explain agreement with the perfective in Section 1.2.2.2. Finally, I talk about the participle form of the MA verbs in Section 1.2.3. I explain the behaviour and the intuitions behind the MA participle in Section 1.2.3.1. This participle form is crucial for the discussion regarding the participle form of the modal *gaadir* in Chapter 3 of this dissertation. I conclude the descriptive section of the participle by describing agreement

⁶Note that the MA root modal *\gdr* obligatory agrees with its subject in terms of number, person and gender features.

morphology with the MA participles in Section 1.2.3.2.

1.2.1 The imperfective

In this section, I investigate the multiple intuitions behind the MA imperfective. I also talk about agreement phenomenon in the MA imperfective. The goal of discussing agreement phenomena is to understand the role of agreement morphology in future examples with the modal *\gdr* and an auxiliary *kaan*. In addition, the agreement discussion helps the reader to understand the relation between the modal phrase and the aspect phrase in Chapter 2, 3 and 4 of this dissertation.

1.2.1.1 The interpretations of the imperfective

In this section, I examine data that represents the various interpretations of the MA imperfective (Al-Kuwari, 2011; Al-Muradi, 1992; Al-Kuwarie, 2009; Wright and Caspari, 1964), and Arabic linguistics (Aoun et al., 2010; Bahloul, 2008; Benmamoun, 1999, 2000; Fassi Fehri, 1993, 2003; Hallman, 2015; Ryding, 2005; Wright and Caspari, 1964; Wightwick, 2017; Hassanein, 2006). My description of the MA imperfective includes verbs on the basis of Vendler's (1976) verbs classification, such as activity, state, achievement and accomplishment verbs.

There is consensus in the literature of classical and modern Arabic grammar that the imperfective typically expresses an uncompleted event. Recall that this is the MA imperfective with present tense. This unfinished event holds at a present utterance time or in the near future. (See the above cited works.) Let us see the interpretations of the MA imperfective below.

For activity verbs, MA native speakers can use imperfective to express a 'habitual reading' of an activity, like running as shown in (10).

- (10) Sami *yizri* *yawmyan*.
 Sami 3.SG.M.run.IMPFV. every.day
 ‘Sami runs every day.’ (MA: Activity Verb)

In (10), there is a reference to a habit, which is running by Sami. An event of running is understood to take place everyday by the use of an adverb *yawmyan* “every day”. The same example as in (10), without “every day”, can express a ‘progressive reading’. The speaker may describe a running event that is taking place at the moment of speech. Example (10) can be disambiguated from the habitual reading by the use of a prefix *bi-* or an adverb *dafieen* “now”, as shown in (11).

- (11) Sami *biyizri* *dafieen*.
 Sami Progressive.3.SG.M.run.IMPFV. right.now
 ‘Sami is running right now.’ (MA: Progressive Reading)

As stated earlier, there are two ways to disambiguate between the habitual and the progressive readings in (11). First, the prefix *bi-* is attached to the main verb to facilitate the progressive reading. The prefix *bi-* is not used in Standard Arabic to express a continuation of an event at the speech time. Rather, it is common in some Arabic varieties acknowledged by Fassi Fehri (2012) and Ouhalla (1999). Second, the adverb *dafieen* “now” shows that the running event is happening right now.

The activity verb, such as *yizri* “runs”, can also be preceded by the auxiliary *kaan*, as in (12). The auxiliary *kaan* can express a continuing event in the past.

- (12) Sami *kaan* *yizri*.
 Sami *kaan*.3.SG.M.PFV. 3.SG.M.run.IMPFV.
 ‘Sami was running/used to run.’ (MA: Progressive Reading)

In (12), there are two possible readings, and the context will define the relevant reading. With the first reading, the speaker gives information about an ‘ongoing event’ in the past (e.g. when Fatimah called Sami yesterday). With the second reading, there is a

information regarding Sami’s past habits (e.g. in his twenties).

For state verbs, I use a verb like *yifiub* “loves”, as shown in (13). The speaker refers to a state of affair where Sami loves Vanilla flavoured ice-cream. The state verb “loves” cannot be combined with the prefix *bi-* to express progressive reading, as in (14), following the generalization that statives are not possible in the progressive.

- (13) Sami *yifiub* ayskreem l-vanilla.
 Sami 3.SG.M.love.IMPFV. ice-cream the-vanilla
 ‘Sami loves vanilla ice-cream.’ (MA: State Verb)

- (14) #Sami *biyifiub* ayskreem l-vanilla.
 Sami Progressive.3.SG.M.love.IMPFV. ice-cream the-vanilla
 ‘#Sami is loving vanilla ice-cream.’ (MA: Progressive Reading)

The same verb, as in (13), can be preceded by the auxiliary *kaan*. The intuition corresponding to sentence (15) is that that Sami used to love the pistachio ice-cream from Stella Luna, but he does not like it any more.

- (15) Sami *kaan* *yifiub* ayskreem l-fustug min
 Sami *kaan*.3.SG.M.PFV. 3.SG.M.love.IMPFV. ice-cream the-pistachio from
 Stella Luna.
 Stella Luna
 ‘Sami used to love the pistachio ice-cream from Stella Luna.’ (MA: State Verb)

One last interpretation of the MA imperfective is a ‘generic reading’. The imperfective also allows a generic interpretation, as shown below.

- (16) ?al-?awlaad *yifiubuu* l-PlayStation.
 the-boys 3.M.love.IMPFV.3.PL.M. the-PlayStation
 ‘Boys love PlayStation.’ (MA: Generic Reading)

For achievement verbs, I give an example of the verb *yitarzim* “translates” to express achievement by an agent, which holds at the present time, as described in (17). In (17),

the speaker is referring to Sami's achievement of translating Nizaar Gabanni's poems into French.⁷

- (17) Sami yitarzim jiŋir nizar gabbani
Sami 3.SG.M.translate.IMPFV. poem nizar gabbani
li-lluyah l-franseeyah.
Preposition-the.language.SG.F. the.French.F.
'Sami has translated Nizar Gabbani's poems into French.'⁸ (MA: Achievement)

The prefix *bi-* disambiguates the progressive reading, as shown in (18), where Ali is wondering about what Sami is doing right now. Fatimah says the statement in (18).

- (18) Sami biyitarɟim li-lluyah
 Sami Progressive.3.SG.M.translate.IMPFV. Preposition-the.language.SG.F.
 lfranseeyah dafieen.
 the.French.F. right.now
 ‘Sami is translating into French right now.’ (MA: Achievement Verb)

The same verb, as shown in (18), can be used to refer to a past progressive reading, as shown in (19). Sami was doing his translation assignment when Fatimah called yesterday.

- (19) Sami kaan biyitarzim
Sami kaan.3.SG.M.PFV. Progressive.3.SG.M.translate.IMPV.
li-lluyah lfranseeyah.
Preposition-the.language.SG.F. the.French.F.
'Sami was translating into French.' (MA: Past Progressive)

In (20), on the other hand, the speaker is talking about a past activity “translation” that Sami used to do when he was thirty years old. Sami is no longer translating into French.

- (20) Sami kaan yitarzim
Sami kaan.3.SG.M.PFV. 3.SG.M.translate.IMPFV.
li-lluyah lfranseeyah.
Preposition-the.language.SG.F. the.French.F.
'Sami used to translate into French.' (MA: Past Activity)

The above examples in (19) and (20) have a past reference, which can be inferred by the

⁷Nizar Gabbani is a famous contemporary Arab poet, a Syrian diplomat and publisher.

⁸Note that this is a ‘perfect reading’ in English. This remains outside the scope of my work.

use of the auxiliary *kaan*.

For the accomplishment verb, I use the active verb *yizri* “runs” that is used in example (10), but I specify the distance of running such as “running a kilometre” to change it into an accomplishment, as in (21).

- (21) Sami *yizri* kilometre yawmyan.
Sami 3.SG.M.run.IMPFV. one.kilometre every.day
‘Sami runs one kilometre every day.’ (MA: Accomplishment Verb)

The speaker is expressing Sami’s accomplishment of running a kilometre, and this event happens every day . By the use of the adverb every day, the habitual reading is understood from Example (21).

To obtain the progressive reading from Example (21), the speaker adds the prefix *bi-* to the verb. Suppose that there is a marathon that is taking place right now, and Fatimah is wondering about what Sami is doing right now. Ali answers Fatimah by saying the following statement in (22).

- (22) Sami *biyizri* dafeen.
Sami Progressive.3.SG.M.run.IMPFV. right.now
‘Sami is running right now.’ (MA: Progressive Reading)

However, through the use of the auxiliary *kaan* with the prefix *bi-* on the verb in (23), the speaker would convey that Sami was running one kilometre at a specific moment, e.g. when Fatima called him yesterday.

- (23) Sami *kaan* *biyizri* kilometre ?ams.
Sami *kaan*.3.SG.PFV. Progressive.3.SG.M.run.IMPFV. one.kilometre yesterday
‘Sami was running one kilometre yesterday.’

(MA: Past Progressive)

The speaker can also refer to a past activity by Sami when he used to run for one kilometre in his thirties, as illustrated in (24). Now, Sami changes his sport interests, and

he is no longer running.

- (24) Sami kaan yi3ri kilometre.
Sami kaan.3.SG.PFV. 3.SG.M.run.IMPV. one.kilometre
'Sami used to run one kilometre (he no longer runs one kilometre now).'

(MA: Past Activity)

From the above discussion, I have demonstrated the various range of interpretations that the MA imperfective might have. In what follows, I describe the agreement morphology on the imperfective verb to agree with its agent in MA.

1.2.1.2 Agreement with the imperfective

In this discussion, I talk about the characterization of the MA imperfective, and it is in agreement with the “subject” DP. The MA verb has to agree with the subject DP in the following features: gender, person and number in MA.⁹ This MA agreement fact is analogous to SA reported in the works of Arabic linguists (Aoun et al. (2010); Benmamoun (1999, 2000); Bahloul (2008); Fassi Fehri (1993, 2003)).

Based on MA imperfective examples sketched in Section 1.2.1, I establish a paradigm for the MA imperfective, as illustrated in Table (1). This MA imperfective paradigm will help the reader to understand the presence of agreement morphology in future examples on the MA modal *\gdr* and the MA auxiliary *kaan*. The following table shows agreement morphology for the verb “write”.

⁹Note that the position of the subject DP relative to the verb contributes to the type of agreement that is obtained in the sentence. In SVO order (a preverbal DP position), the verb checks with its preverbal DP the following features: number, gender and person. In VSO order, on the other hand, the verb checks with its post-verbal DP number and gender features without person (see Soltan (2007); Fakh (2016); Al-Balushi (2011); a.o). In this chapter, I present agreement topic as a fact in MA without discussing details of agreement related to word order in MA since it is out of the scope of this dissertation.

<i>Writes</i>	Asem (M.uline)	Fatimah (Feminine)
1st, SG.	?a-ktub	?a-ktub
1st, PL.	ni-ktub	ni-ktub
Dual	ni-ktub	ni-ktub
2nd, SG.	ti-ktub	ti-ktub-i
*2nd, PL.	ti-ktub-u	ti-ktub-u
3rd, SG.	yi-ktub	ti-ktub
*3rd, PL.	yi-ktub-u	yi-ktub-u

Table (1). Agreement between the imperfective verb and its subject in Makkan Arabic.

In Table (1), the imperfective is both prefixed and suffixed. The prefix, such as *yi-*, *ti-* and *ni-*, always represents the person feature while the suffix, such as *-u*, represents the number feature. Note that MA does not distinguish gender with the second and the third person plurals; the same suffixes are used for masculine and feminine DPs. This case is different from the SA, which is not the language under investigation in this dissertation. (The reader may refer to Classical Arabic Grammar and Arabic Syntax references for further details on agreement in Standard Arabic.)

I find that agreement with the MA imperfective does not diverge from Makkawi's (2015) description of MA agreement paradigm as well as in some varieties of Arabic, such as Egyptian Arabic, as described in (25).

- (25) bi-yi-dris hina dilwa?t.
 asp-3m-study here now
 'He is studying now.'
(Benmamoun, 2000, p.32)

To sum, I have discussed the agreement morphology on the MA verbs with the imperfective. This description of agreement will be important to understand the relation

between the modal phrase and the aspect phrase in Chapters 2, 3 and 4. The following discussion describes the intuitions of the MA perfective.

1.2.2 The perfective

In this section, I describe the interpretation of the MA perfective aspect. I offer a description of the intuitions behind the MA perfective in light of previous works on SA in Section 1.2.2 (Al-Kuwari, 2011; Al-Muradi, 1992; Al-Kuwarie, 2009; Wright and Caspari, 1964; Aoun et al., 2010; Bahloul, 2008; Benmamoun, 1999, 2000; Fassi Fehri, 1993, 2003; Hallman, 2015; Ryding, 2005; Wright and Caspari, 1964; Wightwick, 2017; Hassanein, 2006). Afterwards, I explain agreement with the specifier DP in the MA perfective in Section 1.2.2.2.

1.2.2.1 The interpretation of the perfective

In this section, I explain the intuitions of the MA perfective illustrated by MA examples building on works on SA (Al-Kuwari, 2011; Al-Muradi, 1992; Al-Kuwarie, 2009; Wright and Caspari, 1964; Aoun et al., 2010; Bahloul, 2008; Benmamoun, 1999, 2000; Fassi Fehri, 1993, 2003; Hallman, 2015; Ryding, 2005; Wright and Caspari, 1964; Wightwick, 2017; Hassanein, 2006). Like for the MA imperfective, I follow Vendler's verb classification with the perfective examples.

Unlike the MA imperfective that has a wide range of interpretations, the MA perfective always describes completed events that happened in the past (see the above cited works). My observation about the MA perfective does not diverge from Benmamoun's (2000) view: the perfective is always anchored with past tense. In the following discussion, I present MA examples in perfective aspect including all types of verbs. For convenience, I use the same examples for the MA imperfective, but they are changed to

(26) Sami ʒiri ʔams.
Sami run.3.SG.M.PFV. yesterday
'Sami ran yesterday.'
(MA: Activity Verb)

(27) Sami kaan bi-yizri ʔams.
Sami kaan Progressive-3.SG.M.run.IMPFV. yesterday
'Sami was running yesterday.' (MA: Past Progressive)

(28) Sami fiab ayskreem l-fustug min Stella Luna.
Sami love.3.SG.M.PFV. ice-cream the-pistachio from Stella Luna
'Sami loved the pistachio ice-cream from Stella Luna.'

(MA: State Verb)

(29) Sami tarzum jiʕir nizaar gabbani
Sami translate.3.SG.M.PFV. poem nizar gabbani
li-lluyah lfranseeayah.
Preposition-the.language.SG.F. the.French.F.
‘Sami translated Nizar Gabbani’s poems into French language.’

(MA: Achievement Verb)

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verbs in MA, as in (30), unlike the imperfective.

- (30) #Sami kaan ʒiri kilometre ʔams.
Sami kaan run.3.SG.M.PFV. one.kilometre yesterday
'Sami ran one kilometre yesterday.'

(MA: Accomplishment Verb)

To sum up, I have displayed the multiple interpretations of the MA perfective. I will describe agreement morphology on the MA perfective in the following section.

1.2.2.2 Agreement with the perfective

Given the MA perfective examples in Section 1.2.2, I now illustrate perfective agreement paradigm, which is also similar to what Makkawi's (2015) has reported on the MA perfective. Recall the following example regarding the MA perfective, and it is repeated below for convenience.

- (31) Sami ʒiri ʔams.
Sami run.3.SG.M.PFV. yesterday
'Sami ran yesterday.'

(MA: Activity Verb)

In (31), the MA verb, such as *ʒiri*, agrees with the DP by a suffixal morphology (for this case, agreement is null). In the following Table (2), I present the agreement morphology of the verb "write" with the perfective.

<i>Writes</i>	M.uline	Feminine
1st, SG.	katab-t	katab-t
1st, PL.	katab-na	katab-na
dual	katab-na	katab-na
2nd, SG.	katab-t	katab-ti
*2nd, PL.	katab-tu	katab-tu
3rd, SG.	katab	katab-at
*3rd, PL.	katab-u	katab-u

Table (2). Agreement between the perfective verb and its subject in Makkan Arabic.

In Table (2), agreement has to take place between the MA perfective verb and its preverbal or post-verbal DP. As you can see, suffixal morphology has to be attached to the perfective verb. Notice that MA does not distinguish between feminine and masculine second and third plural specifier DPs. The second person plural suffix is the same for the masculine and the feminine specifier DPs. The same thing is true for the third person plural DPs.

In sum, I have discussed agreement morphology with the MA perfective. In what follows, I will talk about a third form that is derived from MA verbs. This third form is called a ‘participle form’, which will be of great importance in chapter three of this dissertation

1.2.3 The MA participle

The goal of this section is to illustrate a ‘participle form’ that is derived from the MA verbs. In Section 1.2.3.2, I describe the MA participle building on what has been reported for SA in Classical Arabic Grammar (Wright and Caspari, 1964; Al-Muradi, 1992; Al-Kuwarie, 2009; Al-Kuwari, 2011). Afterwards, I explore Arabic studies on the Arabic

participle, which are scarce with respect to generative grammar. A few linguists observe the participle form and formally attempt to analyze the Arabic participles, such as Kinberg (1992); Boneh (2010); Al-Balushi (2011); Makkawi (2015); Hallman (2016, 2017). I conclude the discussion on the MA participle by talking about agreement between the MA participle and its DP in Section 1.2.3.2. The section on agreement with the MA participle helps the reader to understand the morphology of future examples in Chapter 3 of this dissertation.

1.2.3.1 Characterizations of the MA participle

In this section, I explain the main characterizations of the MA participle building on descriptions for SA (Wright and Caspari, 1964; Al-Muradi, 1992; Al-Kuwarie, 2009; Al-Kuwari, 2011). I also show the behaviour of the MA participle in a matrix clause compared to a regular perfective and the imperfective. In addition, I refer to a recent dissertation on MA participles by Makkawi (2015), which I consider the first syntactic attempt to account for the MA participle.

In SA, the Arabic participle is considered a derived from a verb. It is called ‘Nomina agentis’ by Wright and Caspari (1964), a ‘semi-imperfectives’ by Kinberg (1992) or ‘agentive nominals’ by Makkawi (2015). As pointed out by Wright and Caspari (1964), the agentive nominals is actually a subcategory from a larger category that corresponds to ‘participles’. Makkawi differentiates between the MA agentive nominals and the MA participles. The agentive nominals behaves like a noun while the participles have an event reading. (I will not discuss her reasoning here since this distinction is outside the scope of my dissertation.) In this dissertation, I will focus on the MA participle since they show analogous behaviour to MA regular verbs. (Note that MA participles without agents are not discussed in this dissertation.)

My investigation shows that the Arabic participle has not been received adequate attention in the literature of Arabic syntax. However, a few linguists attempted to analyze the Arabic participles from a generative grammar. One of the pioneering studies are by Mitchell (1978) in educated spoken Arabic in Egypt and the Levant, and by Kinberg (1992) in the Koranic texts. Importantly, a recent growing interest regarding the Arabic participles arises by Boneh (2010) for Syrian Arabic; Makkawi (2015) for Makkan Arabic; Hallman (2015, 2016) for Syrian Arabic.

Each of these studies provides a different syntactic analysis of the behaviour of the Arabic participle (I will not consider their analyses here since it is beyond the scope of this dissertation.) Rather, I will focus on the characterization and the behaviour of the MA participle when it appears to function as a regular verb or as a modal. Let us examine an example of the Arabic participles as cited by Kinberg (1992), with the participle of the verbs *\gdr* “la-qaadirun”, as in (32).

- (32) ʔinnahuu ʔalaa raʔʔihii la-qaadirun.
 surely-he on bringing-back-of-him aessrtive-able-one.Participle
 ‘Surely He (God) is able to bring him back (to life).’

(Kinberg, 1992, p.307)

As you can see in Example (32), Kinberg (1992) observes that the participles functions as a verb in the Koranic texts. The participle in (32) has a ‘resultative reading’ where the intuitions of the participle *qaadirun* has the English reading *he has become able*. He further explains this resultative reading as follows. This type of Koranic participles refer to a current state at the speech time. This coexisting state is bounded by a perfective event (an actualized event) at its beginning in the past time. The participles include actualized events and their ‘coinciding state’ reside and continue into the present time. Therefore, he calls these participles ‘retrospective semi-perfectives’. Importantly, the sentence with

the participle *qaadirun* is taken to include a silent auxiliary with the non-past reference. If the speaker wants to refer to past time, then the auxiliary *kaan* has to be present in the sentence.

Based on my observation of MA data, I believe that the Koranic participle *qaadirun* functions like a modal *is able to*. At a later stage in this dissertation (see Chapter 3), I explore the semantics of the MA participle modal *gaadir* in relation to types of aspect in spirit of most recent approaches in semantics.¹⁰ I will give more details about this resultative reading.

Another recent study on Arabic participles is by Makkawi (2015). Her MA dissertation on the participles covers various types and issues of the MA participle. Makkawi also offers a details syntactic analysis of the MA participles, which is beyond the scope of this dissertation. However, I am looking at the modal behaviour of the MA participle *gaadir* in Chapter 3 of this dissertation. I consider her work since we share the same interest of analyzing the same variety of Arabic, Makkan Arabic.

Building on Makkawi, there are a few characterizations of the MA participle, which highlights similarities with regular verbs. These characterizations are presented as follows. First, the MA participles cannot be modified by adjectives, as shown in (33), nor can be associated with the definite article *al-*, as in (34), but rather they are modified by an adverb, as in the coming example (35).

- (33) #hwa Taabix mumtaz.
 3.SG.M. cook.Participle.SG.M. good.SG.M.
 ‘He is a good cook.’ (Makkawi, 2015, p.46)

- (34) #hwa al-Taabix.
 he the-cook.Participle.SG.M.

¹⁰The Standard Arabic participle *qaadirun*, as in Kinberg’s example, is pronounced as *gaadir* in MA fast speech.

‘He is the cook.’

(Makkawi, 2015, p.46)

The MA participle can be followed by the adverb, which is a verbal property, as shown in (35).

- (35) *afimad laaʕib* *befitirat*.
 ahfimid play.Participle.SG.M. professionally
 ‘Ahmad has played professionally.’ (Makkawi, 2015, p.47)

Second, Makkawi further assumes that the MA participle occupies a verbal position, as shown in (36) similar to the imperfective in (37) and the perfective in (38) (see Makkawi’s (2015) syntactic argument for more detail). The MA participle *shariya* ‘have bought’ functions similar to a ‘finite’ verb, as shown in (36). Like the finite verb, the participle associates with a specifier DP *ana* ‘I’, and it takes a direct object *al-kitab* ‘the book’. In this dissertation, I will adopt the more conservative position that there is an ‘invisible auxiliary’ with the participle in non-past. (I offer more detail regarding the presence of auxiliaries in the derivation with participle in Chapter 3.)

- (36) *ana shariy-a* *al-kitab*.
 1.SG.F. buy.Participle-SG.F. the-book.SG.M.
 ‘I have bought the book.’ (Makkawi, 2015, p.48)

- (37) *ana ashtri* *al-kitab*.
 1.SG. buy.imperf.1.SG. the-book.SG.
 ‘I buy the book.’ (Makkawi, 2015, p.48)

- (38) *ana ashtra-yt* *al-kitab*.
 1.SG. buy.perf-1.SG. the-book.SG.
 ‘I bought the book.’ (Makkawi, 2015, p.48)

Third, the MA participle can take a direct object in the same manner as verbs, as illustrated in (39).¹¹

¹¹The gloss of Makkawi’s Example (39) should be *participle* instead of *imperfective*. I take it as a typo by the author.

- (39) hya gary-a al-kitab.
3.SG.F. read.imperf.SG.F. the-book
'She has read the book.'
(Makkawi, 2015, p.49)
- (40) hya te-gra al-kitab.
3.SG.F. 3.F.read.Imperf.SG. the-book.SG.
'She reads the book.'
(Makkawi, 2015, p.49)
- (41) hya gerya-t al-kitab.
3.SG.F. read.Perf-3.SG.F. the-book.SG.
'She read the book.'
(Makkawi, 2015, p.49)

Fourth, a very interesting fact about the shared properties between the MA participle and verbs is the behaviour with respect to the modal *\gdr*. The modal *\gdr* has a participle form *gaadir*. This participle form has to be followed by an imperfective VP complement, as shown in (42). Note that I will study similarities between the MA participles and the perfective with modals in Chapter 3.

- (42) gaadra aftari al-kitab.
ABLE.Participle.1.SG.F. 1.SG.buy.imperf. the-book.SG.M.
'I have managed to buy the book.' (MA)
- (43) gidirt aftari al-kitab.
be.able.1.SG.perf. 1.SG.buy.imperf. the-book.SG.
'I managed to buy the book.' (MA)
- (44) #gidirt(#gaadra) ashtret al-kitab.
be.able.1.SG.perf. buy.perf.1.SG. the-book.SG.
'I am able to buy the book.' (Makkawi, 2015, p.51)

Both the MA participle in (42) and the MA perfective in (43) have to be followed by the imperfective VP complement. The sentences are ungrammatical if they have the perfective VP complement, as shown in (44). The imperfective verbal modal is always followed by the imperfective VP complement, as shown in (45).

- (45) agdar ashtri al-kitab.
 be.able.imperf.1.SG. buy.imperf.1.SG. the-book.SG.
 ‘I am able to buy the book.’ (Makkawi, 2015, p.51)

Fifth, neither the participle nor the perfective can be associated with a future prefix *fia* “will” or a progressive prefix *bi-*, unlike the imperfective, as illustrated from (46) to (51).

- (46) #fia-ashtret al-kitab.
 fut.-buy.perf.1.SG. the-book
 ‘I will bought the book.’ (Makkawi, 2015, p.51)

- (47) #fia-shary-a al-kitab.
 fut.buy.Participle.SG.F. the-book
 ‘I will have bought the book.’ (Makkawi, 2015, p.51)

- (48) fia-ashtri al-kitab.
 fut.buy.imperf.1.SG. the-book
 ‘I will buy the book.’ (Makkawi, 2015, p.51)

- (49) #bi-ashtret al-kitab.
 cont.-buy.perf.1.SG. the-book.SG.
 ‘I am bought the book.’ (Makkawi, 2015, p.51)

- (50) #bi-shary-a al-kitab.
 cont.buy.Participle.SG.F. the-book
 ‘I am have bought the book.’ (Makkawi, 2015, p.51)

- (51) bi-ashtri al-kitab.
 cont.-buy.imperf.1.SG. the-book
 ‘I am buying the book.’ (Makkawi, 2015, p.51)

Finally, the final property that the MA participle shares with the perfective is the occurrence with adverbs like *ged* “already”, as in (53) and (54), and *?ams* “yesterday”, as in (55).¹²

¹²Makkawi has focused on *ged* “already” as a temporal adverb. I have characterized *ged* as a modal. The modal classification is based on the semantic behaviour of *ged*, as spoken in the colloquial MA. The modal *ged* has a formal version, which is *qad*. I will analyze the semantic interaction of the modal *qad* with aspects in Chapter 4 of this dissertation.

- (52) #ged ashtri al-kitab.
already buy.imperf.1.SG. the-book
'I have already buy the book soon.'
(Makkawi, 2015, p.52)
- (53) ged ashtret al-kitab.
already buy.perf.1.SG. the-book.SG.
'I have already bought the book.'
(Makkawi, 2015, p.52)
- (54) ged shari-a al-kitab.
already buy.Participle.SG.F. the-book.
'I have already bought the book.'
(Makkawi, 2015, p.52)
- (55) ana shari al-film (min) ams.
I buy.Participle.SG.M.. the-movie since yesterday
'I have bought the movie since yesterday/yesterday.'
(Makkawi, 2015, p.55)

According to Makkawi, the participle *shari* "have bought" has a resultative reading compared to the perfective, which refers to a completed event, as shown in example (54). Note that the adverb *?ams* "yesterday" and *min ?ams* "since yesterday" are both acceptable in MA.

Given the above MA data, I have elucidated the characterizations of the MA participles in light of Arabic Classical Grammar and Arabic linguistics. I have also showed that the MA participle shares some features with regular verbs, therefore they are treated as verbs rather than nouns. This finding is important for my research about the similarities between the MA participle and the perfective relative to MA modals, which I will investigate in Chapter 3. In what follows, I show the agreement morphology that appears on MA participle.

1.2.3.2 Agreement in the MA participles

In this section, I describe agreement morphology on the MA participles. The goal of this description is a better understanding of the relation between modals and aspect phrase. A

- (59) The Arabic “modal system” is not grammatical, rather it is mostly lexical. Therefore, any word which expresses a modal meaning can be part of the system regardless of its grammatical category. (p.45)

My observation and description of MA modals is inspired by previous works (Benmamoun (2000) on SA & Moroccan Arabic; Aoun et al. (2010) on SA, Moroccan Arabic & Lebanese Arabic; Bahloul (2008) on *la-qad*; Meziani (1983) on Moroccan Arabic; Zayed (1983) on Literary Arabic; Abdel-Fattah (2005) on SA; Michalski (2011) on *la-qad* and Moshref (2012) on Cairene Arabic). Even though these works offer fruitful insights relative to the description of Arabic modals, they do not offer formal semantic analysis of Arabic modals. Regarding MA modals, my task is to find common modals between SA and some varieties of Arabic with the MA modal system. Afterwards, I describe a representative sample of MA modals and offer an overview of their interpretations on the basis of MA native speakers’ intuitions, as illustrated in the following discussion.

Building on the above works on Arabic modals, there is consensus of classifying Arabic modals into ‘verbal modals’ and ‘semi-verbal modals’. I find that MA modals follow the same type of classification. In what follows, I explain these two modal classifications relative to MA modal system.

For the verbal modals, this set includes *yaʒib* “must”, *yanbayi* (formal) versus *yibyali* (informal) “should”, *yastaʔeeʔ* “can/be able to” and *\gdr* “be able to/manages to”¹⁴. In what follows, I start describing the characterizations of the verbal modal *\gdr*, and then I describe a larger sample of the MA verbal modals¹⁵.

¹⁴Here is the root morphology for the verbal modals: *\ʒb* for *yaʒib* “must”, *\nby* for *yanbayi* (formal) versus *\byl* for *yibyali* (informal) “should”, *\stʔ* for *yastaʔeeʔ* “can/be able to”

¹⁵Note that some verbal modals are used in formal text and speech. The verbal modals seem to behave like verbs in terms of accepting agreement morphology as regular verbs. The modal verbs also can appear

For the verbal modal $\backslash gdr \backslash$, it has an ‘ability reading’, as shown in (60). Note that I use ‘ABLE’ for glossing $\backslash gdr \backslash$.

- (60) $\text{\textcircled{f}asem}$ yi-gdar yi-sbafi fi l-bufiayrah .
 Asem 3.SG.M.-ABLE.IMPFV. 3.SG.M.-swim.IMPFV. in the-lake
 ‘Asem is able to swim in the lake.’

(MA: Imperfective)

In (60), imagine a scenario that Asem and his parents are invited to Ana’s cottage this weekend. There is a lake close to the cottage. Ana is wondering about Asem’s swimming abilities. His parents say that Asem is able to swim in the lake, as shown in (60).

The verbal modal $\backslash gdr \backslash$ is possible to express a ‘permission reading’, as illustrated in (61).

- (61) ti-gdar $\text{ti-l\textcircled{f}ab}$ bi-l-playstafun $\text{ba\textcircled{f}ad ma}$
 you-ABLE.M.IMPFV. you-paly.M.IMPFV. with-the-PlayStation after ma
 ti-yallig muzakarat-ak .
 you-finish.M.IMPFV. studies-your
 ‘You are allowed to play PlayStation after you are done with your studies.’

(MA)

In (61), suppose that Asem wants to play PlayStation, but he has a math assignment. His mother does not allow him to play unless he finishes his math assignment, as stated in (61).

After presenting the intuitions of the modal $\backslash gdr \backslash$, I observe the following properties with the modal $\backslash gdr \backslash$. First, the modal $\backslash gdr \backslash$ shares some properties with regular verbs. It accepts aspectual morphology (similar to what has been observed for modals in other languages, such as Hindi-Urdu (Bhatt, 1999, 2006) and French (Hacquard, 2006, 2009) with aspectual morphology. The verbal modals $\backslash gdr \backslash$, yibyali and $\backslash mkn \backslash$ for *yemkin* are available in informal and formal text and speech among MA native speakers. I am interested to study the semantics of the modals are commonly used by native speakers of MA.

(62) ʔasem yi-gdar yi-sbafi fi l-buʔayrah.
 Asem 3.SG.M.-ABLE.IMPFV. 3.SG.M.-swim.IMPFV. in the-lake
 (MA: Imperfective)

(63) ʔasem gidir yi-sbaʔi fi l-buʔiayrah l-ʔusbuuʔ
 Asem ABLE.3.SG.M.PFV. 3.SG.M.-swim.IMPV. in the-lake the-week
 l-maʔie.
 the-last
 (MA: Perfective)

(64) Fatimah gaadr-ah titzallaḡ ṣala r-rideau canal.
Fatima ABLE.Participle-3.SG.F. 3.SG.F.skate.IMPFV. on the-Rideau Canal
'Fatima has managed to skate on the Rideau Canal.' (MA: Participle)

(65) #ʔafimad yi-gdar saafar fi S-Sayf
Ahmad 3.SG.M.-ABLE.IMPFV. travel.3.SG.M.PFV. prep. the-summer
'Ahmad is able to/manages to travel in the summer.'
(MA)

Finally, since the verbal modal $\backslash gdr \backslash$ accepts aspectual morphology, this fact with aspect leads to interesting semantic interpretations of the modal; a case that is not available with English modals. Let us see the way the reading of the modal changes upon the use

of a different type of aspect, as in (66).

- (66) gidir-t ti-lʕab bi-l-playstafun baʕad ma yallag-t
 ABLE.PFV. you-play with-the-PlayStation after ma finish.PFV.-you
 muzaakarat-ak
 studies-your
 ‘You managed to play the PlayStation after you finished your studies, (#you
 didn’t play).’ (MA)

In (66), if the perfective is applied to the verbal modal $\backslash gdr \backslash$ with the permission flavour, the modal acquires a ‘managed to reading’. Notice the way aspect shifts the flavour of the $\backslash gdr \backslash$ in the above examples. With perfective, and the event of playing is actualized, as shown in (65). As I stated earlier, this is known in the literature as ‘actuality entailments’ (AEs). Actualization of an event simply means that it is completely carried out and finished before the speech time in the actual world. The permission flavour is still maintained, but the event is actual. With imperfective, the event is not actual, as shown in (60) for the ability reading and (61) for the permission reading. This phenomenon about the interaction between the MA modals and aspect is what I am interested to investigate and formally account for in Chapter 2 of this dissertation.

For the rest of the verbal modals, such as *yaʕib* “must”, *yibʕali* “should” and *yastateeʕ* “can/be able to”, these modals have one form, which is the imperfective form in line with Zayed (1983). They never agree with their specifier DPs except *yibʕali* “should”, as in (67) below. However, they have to be followed by a subjunctive clause headed by *?an*, as in (67).

- (67) yaʕib ?an tanaama bakiran.
 yaʕib ?an you.sleep.SG.M.IMPFV. early
 ‘You must sleep early.’ (MA)

The verbal modal *yibʕali* “should” is inflected with a pronominal to agree with the speci-

misses doing his assignments. His math teacher mentions that he has not submitted few assignments in the parent meeting. The mother discusses this issue about Ahmad with his father. The father thinks that Ahmad exceeds the two hour limit for playing PlayStation over the last month, as in (73).

- (73) mumkin liʕib kateer bi-l-playstafun.
 may play.PFV.3.SG.M. a.lot with-the-PlayStation
 ‘You might have played a lot of PlayStation.’ (MA)

This semi-modal \mkn\ differs from *rubbamaa* by having a second interpretation which is permission. One final use of \mkn\ is a polite request. It is always linked with the imperfective aspect, as in (74).

- (74) mumkin ʔa-stalif mayt riyal.
 may I-borrow.1.SG.IMPFV. one.hundred riyal
 ‘Would you lend me one hundred riyal?’ (MA)

In (74), note that the contextual factors helps a reader or a listener to derive the permission reading of the semi-modal \mkn\.

However, the permission interpretation is restricted to the imperfective complement, as shown in (75), but it cannot be invoked with the perfective one.

- (75) mumkin ti-lʕab bi-l-playstafun baʕad ma ti-ʕallig
 may you-play.IMPFV. with-the-PlayStation after ma you-finish.IMPFV.
 muzaakarat-ak
 studies-your
 ‘You may play PlayStation after you are done with your studies.’ (MA)

The third semi-modal is *qad*, and it shows interesting semantic facts when it interacts with types of aspects. I focus on the intuitive interpretations of *qad* in relation to other MA semi-modals in this discussion. Let us begin with the imperfective complement, as shown in (76).

(76) ʔahmad qad yixbiz pizza ʕala l-ʕaʕa.
Ahmad qad 3.SG.M.bake.IMPFV. pizza for the-dinner
Ahmad might be baking pizza for dinner (but I am not sure).’ (MA)

In (76), the speaker is uncertain about what Ahmad is making for dinner. It is possible that Ahmad may bake a pizza, but he may change his mind and cook pasta instead.

Importantly, when the semi-modal *qad* precedes a perfective complement, it gives rise to a ‘actual completed event interpretation’. Imagine a scenario where Ahmad completely finished reading *Middlemarch*. By using the modal *qad*, there is assertion that Ahmad did not leave some parts unread, as presented in (77).

(77) ʔhmad qad qaraa *Middlemarch*.
Ahmad qad read.3.SG.M.PFV. *Middlemarch*
'Ahmad already read *Middlemarch*, (#but I am not sure).'

Based on the above examples of the MA semi-modals, we have seen the way the interpretation of the modal varies depending on the type of aspect of the modals' complements. MA semi-modals do not always generate AEs with the perfective. The modal *qad* is the only semi-modal that leads to AEs with the perfective.

Given the novelty of *qad* in the literature of modals and aspect in Chapter 4, I will investigate the semantic behaviour of the MA semi-modal *qad* relative to the most recent approaches in formal semantics in Chapter 4 (Bhatt, 1999, 2006; Hacquard, 2006, 2009, 2014; Homer, 2011a). I also aim to account for the semantics of the MA *qad* in Chapter 4 of this dissertation. In Chapter 4, I will provide more scenarios and examples that describe the various flavours of the semi-modal *qad*.

The fourth semi-modal in this section is \lzm\ “must” and its counterpart *laabud* “ought to”. I observed that the semi-modal \lzm\ has multiple flavours ranging from obligation, deduction and bouletic interpretations. Let us see a few examples which illus-

trate these various flavours.

Consider the following obligation scenario where X airlines sets some rules to be obeyed by passengers. This X airline has rigid rules when it comes to number and size of baggage for each passenger. The airline assigns fees for extra as well. At the airport counter, the X airline employee asked a passenger, who has an overweight baggage issue, to obey X airline rules. The following statement is compatible to this X airline rules for all passengers, as shown in (78).

- (78) laazim ti-tgyad bi-l-wazn l-masmuufi.M. li-kull-i
 laazim you-follow.IMPFV. with-the-weight.M the-allowed for-each-Gen.
 raakib.
 passenger
 ‘You must follow the allowed weight for each passenger.’ (MA)

Here are more examples for \lzm\ versus *laabud* where the semi-modals *laazem* and *laabud* are used by MA native speakers. Imagine a scenario where a mother asks her daughter to do her bed every day, as a part of household regulation. The mother always repeats the sentence below:

- (79) Laazim tirattibi sareer-ik kuli yuum.
 must you.F.-organize.IMPFV.-you.F. bed-your.F. every day
 ‘You must do your bed every day.’ (MA)

In (79), a strong necessity \lzm\ (must/ have to) has a ‘deontic reading’, like Moshref (2012). The sentence cannot be followed by ‘but it is obligatory to do that’, as noted by V. Fintel & Iatridou’s (2008) for strong deontic modals. The intuition of the semi-modal \lzm\ shows a ‘strong obligation reading’.

I propose that the semi-modal \lzm\ has the modal *laabud* as a ‘weak obligation counterpart’ “ought to”. Let us see the following scenario: Suppose that the mother and the daughter travel to Florida and stay in a hotel for some nights. Remember that the

that the complement clause is in the present imperfective aspect.

The second indirect reading of (81) has an ‘epistemic deductive reading’. Suppose that Fatimah is working on a computer and is holding a VISA card in her hand. She is trying to pay the ticket online. Her mother is calling her, and Fatimah is not responding. Fatimah’s father says sentence (81) based on his knowledge of her having a red light ticket and the image of the VISA card.

When the VP complement is alternated into perfective *ti-dfaʿ*, only one reading is obtained that is an ‘epistemic necessity reading’, as in (82).

- (82) Fatimah laazem dafaʿ-at ʔ-al-muxaalafa
Fatimah must pay.PFV.-she ʔ-the-ticket
‘It must be the case that Fatimah paid the ticket.’ (MA)

As I have shown, several semi-modals display interaction with aspect in the embedded clause. In this dissertation, I will only focus on the semi-modal *qad*.

To sum, I have elucidated a concise picture of the MA modals including the verbal modals and the semi-modals building on previous works on Arabic modals. In this section, I describe the types of MA modals—the verbal modals versus the semi-modals—by showing the reasoning behind this classifications in the MA modal system.

To conclude Section 1.2 and Section 1.3, I have described MA tense, aspect and modals on the basis of MA data. In what follows, I will discuss the formal treatments for aspects and modality by Kratzer (1998) for tense and aspect, and Kratzer (1977, 1981, 1991, 2012) for modality. Afterwards, I apply her proposals into MA tense, aspect and modals data. Note that I will not consider the interactive relationship between MA modals and MA aspect in Chapter 1. In what follows, I will apply Kratzer’s theory and treat aspect and modals categories as independent categories in the computation. At a later level in this dissertation, I will examine the interaction between of three the MA modals \gdr\,

gaadir and *qad* with types of aspect (see Chapter 2, 3 and 4 of this dissertation).

1.4 Formal semantics of tense and aspect

In this section, I discuss the formal semantics of tense, aspect and modals. I also illustrate the computation of tense and aspect of an MA matrix clause in the spirit of Kratzer's (1998) proposal for English tense and aspect in Section 1.4.1. In Section 1.5.1, I present Kratzer's (1981; 1991) system that accounts for the various interpretations of English modals. Finally, I adopt Kratzer's proposal into MA modals in Section 1.5.2. In what follows, I introduce the computation of MA matrix clauses in the imperfective and the perfective building on Kratzer's (1998) proposal.

1.4.1 Formal semantics for the MA aspect and tense

I begin by spelling out the compositional statement for MA past perfective and present imperfective sentences in the light of Kratzer's (1998) tense and aspect framework. I will follow Kratzer's (1998) basic proposal and will apply it into the MA past perfective, as shown (83). This is a widely accepted framework in the literature on tense and modality (see also Hacquard (2006); Von Stechow and Iatridou (2008)). Recall that MA tense and aspect morphology are conflated, as sketched earlier in Section 1.2.

- (83) $\text{ʔomar katab} \quad \text{ʔal-risaalah.}$
 Omar write.3.SG.M.PFV. ʔthe-letter.F.
 'Omar wrote the letter.' (MA)

The above MA sentence is predicted to have the following the basic sentence structure, as described in (84) (for simplicity, I use English for the VP).

- (84) $[_{TP} \text{ Past } [_{ASP} \text{ Perfective } [_{VP} \text{ Omar wrote the letter}]]]$

I adopt Kratzer's (1998) VP, aspect and tense compositional structure for English. In

Kratzer's system, the VP level always represents properties of events. The VP category needs to be mapped to aspect to later return properties of time.¹⁸ Let us see the way these categories are composed in (85).

$$(85) \quad [[VP]] = \lambda e_{\ell}. \lambda w. e \text{ is an event of Omar writing the letter in } w.$$

In (85), there is a property of events that is Omar writing the letter in w . This property of event needs to be combined with the perfective in the aspectual phrase. Aspect has the property of linking two components in the computation. They are tense and events. Tense denotes time intervals while VP is a predicate of events, so aspect quantifies over predicate of events and returns a predicate of time. The lexical entries for perfective aspect is presented, as in (86).

$$(86) \quad [[\text{Perfective}]] = \lambda P_{\langle \ell, \langle st \rangle \rangle}. \lambda t_i. \lambda w_s. \exists e_{\ell} (\text{time}(e) \subseteq t \wedge P(e)(w) = 1) \\ (\text{"Event time included in reference time".})$$

In (86), the lexical entry for the perfective needs to combine with the denotation of the VP "Omar writes the letter", and the result will be as below:

$$(87) \quad [\lambda t_i. \lambda w_s. \exists e_{\ell} [e \text{ is a writing event of Omar writing the letter in } w \wedge (\text{time}(e) \subseteq t)]]$$

In (87), this is a property that is true of a time t in a world w iff there is an event e of Omar writing the letter in the world w and the event time is included in the reference time t .

Once we have the predicate of time level in the computation, we need to combine it with tense. Kratzer (1998) outlines the lexical entry of tense as setting the properties of tense. She follows Partee's (1973) tense approach by stating that tense behaves similarly

¹⁸For the denotation of the event, I will use Hacquard's (2006, 2009) convention for the property of event in this dissertation. The VP type is $\langle \ell, \langle s, t \rangle \rangle$.

to pronouns. In other words, as pronouns refer to individuals, tense refers to time, as in (88), where pronominal past tense refers to a silent past time interval:

$$(88) \quad [[\text{Past}_7]]^{g, c} = g(7) = t_7, \text{ defined only if } g(7) \leq s^* \text{ (speech time)}$$

Given Kratzer's past tense entry, the result of combining AspP with T is illustrated in (89).

$$(89) \quad [[\text{TP}]] = \lambda w_s. \exists e_\ell. [e \text{ is an event of Omar writing the letter in } w \wedge \text{time } e \subseteq t_7]$$

The sentence in (89) will be true in an evaluation world w iff there is a writing event of the letter by Omar in the evaluation world w , while tense locates the event of writing the letter in the salient past time.

Now, let us turn our attention to the compositional statement of the MA present imperfective in the spirit of Kratzer's proposal. The following example, as in (90), is a predicted structure of the MA imperfective sentence in (91).

$$(90) \quad \begin{array}{ll} \text{ʔomar yiktub} & \text{ʔal-risaalah.} \\ \text{Omar 3.SG.M.write.IMPFV. ʔthe-letter.F.} & \\ \text{'Omar is writing the letter.'} & \text{(MA)} \end{array}$$

$$(91) \quad [_{TP} \text{ Present } [_{ASP} \text{ Imperfective } [_{VP} \text{ Omar is writing the letter in } w]]]$$

In what follows, I present the denotations of the MA imperfective in the same sequence as presented for the MA perfective. In addition, I adopt Kratzer's imperfective and present tense lexical entries. Remember that MA tense and aspect are represented with the same morphology, sketched earlier in Section 1.2. The denotation of the VP is given earlier, and it is repeated in (92).

$$(92) \quad [[\text{VP}]] = \lambda e_\ell. \lambda w. e \text{ is an event of Omar writing the letter in } w.$$

Now, this property of event of writing the letter by Omar needs to be mapped by the MA imperfective, as illustrated in (93).

$$(93) \quad [[\text{Imperfective}]] = \lambda P_{\langle \ell, \langle s, t \rangle \rangle} \cdot \lambda t_i \cdot \lambda w_s \cdot \exists e_\ell (t \subseteq \text{time}(e) \text{ and } P(e)(w) = 1)$$

‘reference time included in event time’

Upon applying the imperfective into the VP “Omar writes the letter”, we obtain the result in (94).

$$(94) \quad [\lambda t_i \cdot \lambda w_s \cdot \exists e_\ell. [e \text{ is an event of Omar writing the letter in } w \wedge t \subseteq \text{time}(e)]]$$

In (94), this is a property that is true of a time t in a world w iff there is an event e of Omar writing the letter in w and the reference time t is included in the event time.

For the present lexical entry, I also follow Kratzer’s (1998) lexical entry for present tense, as in (95).

$$(95) \quad [[\text{Present}_7]]^{g, c} = g(7) = t_7, \text{ defined only if } g(7) \approx s^*$$

The above computation will give us the following result, as illustrated in (96).

$$(96) \quad [\lambda w_s \cdot \exists e_\ell. [e \text{ is an event of Omar writing the letter in } w \wedge \text{time}(e) \approx s^*]]$$

Given ((96), the sentence (90) will be true in a world w iff there is a writing event of the letter by Omar in the evaluation world w , with tense locating the writing event at the speech time.

To conclude, I have presented the compositions of the MA matrix clauses in both the perfective and the imperfective aspect. These compositional statements are inspired by Kratzer’s (1998) tense and aspect proposal. In the following section, I will discuss Kratzer (1977, 1981, 1991, 2012) system for English modals. Later, I adopt her proposal to compute MA modals.

1.5 Formal semantics for modality

Before I present details about Krater's proposal for modals in Section 1.5.1, I describe what is meant by "modals" as a modal expression in a natural language in light of previous works on modality (Jackendoff, 1971; Kratzer, 1977, 1981, 1991; Lewis, 1973; Copeland, 2002; Hacquard, 2006; Portner, 2009).

Let us start the discussion by explaining the expression "modals". Speakers in any natural language need to express their thoughts and needs about rules that have to be obeyed (e.g. pay a ticket for exceeding the speed limit), state of affairs that express desires (e.g. having a dog at home), states of affairs that could happen (e.g. Asem lift the fridge) or what would have happen (e.g. Toronto as the capital of Canada). All of these states of affairs can be conveyed by the use of modals.

Modals, as a linguistic category, are a large set that involves various subtypes of categories in a natural language. These subtypes include auxiliary verbs like English *must*, *may*, *should* and *have to*, English adjective like *possible* and English adverbs like *probably*. In this section, I will explore the semantic behaviour of modal auxiliary verbs in English and in Makkan Arabic (MA) under the Kratzerian theory of modality. I follow the Kratzerian system, which offers a single lexical entry for modals that appear to have many interpretations, such as *must* and *can*. For example, the modal *must* has a wide range of flavours ranging from an 'epistemic necessity' to a 'root deontic' interpretations. These flavours can be captured by Kratzer's proposal of having a single lexical entry for *must* that reflects its universal quantificational force. In addition, Kratzer's modal proposal, which I will explain in detail in Section 1.5.1, inspires other semanticists to develop her modal proposal to capture the cross-linguistic variation among languages other than English modals (see e.g., Hacquard (2006, 2009)).

Logicians are concerned with the reasoning behind the expression of modals. The logicians' goal is to understand the reasons and the main features of the epistemic and the deontic interpretations of the modals. They use some logic symbols to represent necessity and possibility. The logic symbol for the possibility modals is a $\diamond$, while the necessity modals has $\square$. For logicians, the possibility expression includes English possibility modals such as *may*, *might*, *can* and *could*, while the necessity expression involves English necessity modals involve *must*, *should*, *would* and *have to*. Logicians have traditionally ignored the way the modals compose in sentences.

The modal “must” can be interpreted as an ‘epistemic modal’. The interpretation of the epistemic modal relies on the speaker’s knowledge, pieces of evidence and available information, as illustrated in (97).

- (97) Jockl must have been the murderer (In view of the available evidence, Jockl must have been the murder). (Epistemic (Kratzer, 1991, p.639))

In (97), the epistemic modal *must* has an ‘epistemic necessity flavour’. However, the necessity modal *must* can have other flavours, which are not epistemic. Rather, these various flavours are considered to be ‘root deontic’, as in (98), ‘root teleological’, as in (99).

- (98) Jockl must go to jail (In view of what the law provides, Jockl must go to jail).

(Deontic (Kratzer, 1991, p.640))

- (99) John wants to get a PhD. He must write a thesis.

(Teleological: (Hacquard et al., 2016, p.2))

In addition, the necessity modal *must* sometimes depends on the circumstances surrounding the embedded event or the agent—having a pure circumstantial flavour as with

root modals. The modal logic calls this type of modality as ‘root modals’, as shown in (100).

- (100) Jockl must sneeze (In view of the present state of his nose etc., Jockl must sneeze).

(Circumstantial interpretation (Kratzer, 1991, p.640))

Modal expressions are roughly classified into ‘epistemic modals’ versus ‘root modals’. Epistemic modals refer to knowledge, evidence, etc, while root modals refer to a body of laws, desires, ability, teleological and bouletic interpretations. I have shown that the modal *must* can be an ‘epistemic modal’, but it has multiple flavours that are considered like root modals.

Logicians use quantificational force over possible worlds in the same manner as quantifiers quantifying over individuals. In English, the quantifiers *some* and *all* have different quantificational forces, universally or existentially, over individuals. With a quantifier *some*, the quantificational force is always an ‘existential force’. With a quantifier *all*, the quantificational force is a ‘universal force’. Logicians incorporate quantificational forces into the interpretations of the modals. Like *some*, the possibility modal $\Diamond$ existentially ‘ $\exists$ ’ quantify over possible worlds. Similar to *all*, the necessity modal $\Box$ universally ‘ $\forall$ ’ quantify over possible worlds.

1.5.1 Kratzer’s account for modality

In this section, I work towards an understanding of Kratzer’s (1981; 1991; 2012) treatment for English modals. I show Kratzer’s computation for the English modals, which I will later adopt for the MA data in Section 3.4. Her proposal has a great impact on the theory of modality. In fact, it becomes the framework of many subsequent approaches on modals

that account for modals cross-linguistically. In this dissertation, I follow the key insights in Kratzer’s framework on modality. However, at a later stage of this dissertation (see Chapters 3 and 4), I provide some adjustments into her proposal to capture the novelty of MA modals in the spirit of some recent approaches on modality (Condoravdi, 2001; Portner, 2003; Hacquard, 2006, 2009; Homer, 2011a; Von Stechow and Iatridou, 2008) (as I investigate in Chapters 3 and 4 of this dissertation).

Kratzer proposes two core ingredients building on the fact that modals are context-dependant. The first ingredient is the conversational background known as the ‘modal base f ’, which is also considered as a parameter of interpretation. This parameter of interpretations stands for “in view of what is known”, “in view of what the law provides” etc. Kratzer considers this parameter as a modal base ‘ f ’ that assigns to every possible world a set of propositions p which is true in w . Let us see the way her proposal works.

Consider the following proposals for the necessity and the possibility modals. The propositions α is related to the parameter f , as shown in (101) and (102).

$$(101) \quad [[\text{must } \alpha]]^f = \{w \in W: [[\alpha]]^f \text{ follows from } f(w)\}^{19}$$

$$(102) \quad [[\text{can } \alpha]]^f = \{w \in W: [[\alpha]]^f \text{ is compatible with } f(w)\}^{20} \quad (\text{Kratzer, 1981, p.43})$$

In (101) and (102), the function of the conversational background, the function f , is to assign a set of propositions to each world w in W . For (101), an epistemic background is the function f_{epis} , which assigns known/believed propositions to each world w in W . In (102), the circumstantial background is the function f_{circ} , which assigns true propositions to each world in W . I will now apply this proposal of the modal base f on Kratzer’s toy example, as in (103).

¹⁹ All worlds compatible with $f(w)$ are α -worlds.

²⁰ Some worlds compatible with $f(w)$ are α -worlds.

- (103) Jockl must have been the murderer (In view of the available evidence, Jockl must have been the murder). (Epistemic, (Kratzer, 1991, p.639))

Sentence (103) is true in a world w if, and only if, it follows from what is known in w such that Jockl is the murder.

Kratzer further identifies two basic classes of modals where the function f can be epistemic or circumstantial. If the flavour is epistemic, then the function f is epistemic and we obtain the epistemic modals. If the flavour is the circumstantial, then the function f is circumstantial and we obtain the root modals. Both of these two types of conversational backgrounds express facts, hence they are considered as ‘realistic conversational backgrounds (modal bases)’. According to Kratzer, a realistic conversational background is defined, as in (104).

- (104) A realistic conversational background is a function f such that for all $w \in W$, $w \in \cap f(w)$.

Building on the distinction between the epistemic and the circumstantial backgrounds, Kratzer examines the following examples for the English modals *can* and *must*.

- (105) Hydrangeas can grow here. (Kratzer, 1991, p.646)

Imagine a scenario where the speaker bought a piece of land, and he loves hydrangeas. He finds that the soil and the climate are perfect for prospering hydrangeas. In (105), the proposition that involves the modal *can* is true on the basis of the circumstances including the soil and the climate. This flavour of the modal *can* has the circumstantial modal base f .

Now, let see the second possible interpretation of her toy example in (106) below:

- (106) There might be hydrangeas growing here. (Kratzer, 1991, p.646)

In (106), suppose that the speaker travels to a country where there are different kinds of vegetation from his own country. Based on the available evidence provided by the context parameter, the modal *might* has an epistemic modal base f .

To sum up, I have shown Kratzer's first ingredient to capture the various flavours of the epistemic modals, such as *must* and *might*. Her proposal maintains the quantificational forces— $\forall$ for *must* and $\exists$ for *might*—across modal's flavours. To account for these various flavours, the function f identifies the type of the conversational background for the epistemic modal *must* to yield an 'epistemic necessity flavour' or a 'root deontic flavour'.

As you can see, the modal base f is crucial to determine the type of the flavour for the modal. The intersection of the propositions in that set gives us the set of possible worlds that are accessible.

(107) The modal basis for the modals *must* and *can* are as follows:

a. $\cap f_{epis}(w) = \{w' : w' \text{ is compatible with what is known in } w\}$

b. $\cap f_{circ}(w) = \{w' : w' \text{ is compatible with certain circumstances in } w\}$

(Hacquard, 2010, p.85)

In Kratzer's proposal, there is another parameter is required to rank these possible worlds. This second parameter is a second conversational background. This second conversational background g selects the best accessible worlds on the basis of a set of proposition; hence it is called an '*ordering source* g ' Kratzer (1981, 2012). A strict ordering of the propositions is induced by $\leq_{g(w)}$, as in (108).

(108) Ordering $\leq_A$: For all $w, z \in W$: $w \leq_A z$ if and only if $\{p : p \in A \text{ and } z \in p\} \subseteq \{p : p \in A \text{ and } w \in p\}$ (Kratzer, 1981, p.47)

The ordering source in (108) compares two worlds w and z in W . A world w is more

“ideal” given a set of propositions A than a world z if and only if more propositions in set A hold in world w than in world z .

Building on the second parameter proposal, the epistemic modal base typically associates with a ‘stereotypical ordering source’. The root modal base, on the other hand, combines with deontic (a body of laws), bouletic (wishes) or teleological (aim) orderings. Let us apply this ordering source g to the toy Example in (109).

(109) John must go to jail. (Hacquard, 2006, p.35)

Building on the ordering source in (108), the best world will be one where the law is obeyed. A less ideal world will be the one where one law is broken (e.g. a world where John is a murderer); there are worlds where the law is obeyed and the murderer will go to jail. Given example (109), the circumstantial modal base f returns a set of worlds where John committed a crime. The best worlds in this set will be those in which John is a murderer, and he goes to jail.

Kratzer’s proposal allows for a single lexical entry for the modal *must* to capture the various readings of the modal by the presence of these two parameters of interpretations, as shown in (110). For any world w , conversational backgrounds f , g , and propositions q :

(110) $[[\text{must}]] = \lambda f_{\langle s, stt \rangle} . \lambda g_{\langle s, stt \rangle} . \lambda q_{\langle st \rangle} . \lambda w . \forall w' \in \max_{g(w)} (\cap f(w)) : q(w') = 1$

(Hacquard, 2010, p.85)

In (110), a sentence *must p* is true relative to a conversational background f if and only if p is true in *all* the best worlds in the modal base $f(w)$, which returns a set of worlds that are epistemically or circumstantially accessible. The set of worlds given by $f(w)$ are ordered by an ordering source $g(w)$, according to the available evidence, for epistemic reading, or to an ideal provided by the law, for root deontic reading.

Having defined the lexical entry for the epistemic modal *must*, Kratzer proposes a lexical entry for the root modal *can*, as illustrated in (111).

- (111) $[[\text{can}]] = \lambda f_{\langle s, stt \rangle} . \lambda g_{\langle s, stt \rangle} . \lambda q_{\langle st \rangle} . \lambda w . \exists w' \in \max_{g(w)} (\cap f(w)) : q(w') = 1$. (Hacquard, 2010, p.85)

From (110) and (111), Kratzer succeeds in proposing a unified lexical entry for English epistemic and root modals. By considering the modal base f and the ordering source g , we can now account for the various interpretations that modals *must* and *can* can have.

To sum up, I have presented Kratzer's modal framework which accounts for the various flavours of English modals in this section. In what follows, I follow Kratzer's framework on MA modal data.

1.5.2 The MA semantics of modals

In this section, I adopt Kratzer's (1981; 1991; 2012) proposal on MA modals. In what follows, I present the computation of the MA modal *qad*, which I have already described in Section 1.3. For simplicity, I will discuss the computation of the modal *qad* where it has an imperfective VP complement, as shown in (112).

- (112) ʕomar qad yiktub ʔal-risaalah.
 Omar qad 3.SG.M.write.IMPFV. the-letter
 'Omar might be writing the letter.' (MA)

Building on Kratzer's parameters of interpretations of the modal expression, I first identify the modal base f of the MA modal *qad*. In (112), the MA modal *qad* has an epistemic conversational background, which is analogous to the epistemic modal base f of *may*. In this case, this epistemic modal base f describes speaker's knowledge or beliefs.

According to Kratzer's system, there is a second ingredient in the computation, which is the ordering source g corresponding to the speaker's expectations. This ordering source

g orders the worlds which are compatible with the speaker's knowledge. Having identified the modal base f and the ordering source g of the MA modal *qad*, the lexical entry for the modal *qad* will be as in (113).

$$(113) \quad [[Qad]] = \lambda f. \lambda g. \lambda p. \lambda w. \exists w' \in MAX_{g(w)} : (\bigcap f(w) : p(w') = 1$$

The sentence in (113) will be true if and only if there exists a world compatible with what the speaker knows in w with certain properties. The domain of f is a set of worlds that are epistemically accessible. The function of f is to assign to the possible worlds sets of propositions that are all true in w . The ordering source $MAX_{g(w)}$ is stereotypical, the function of $MAX_{g(w)}$ is to select the best worlds of the modal base in which a subset of the propositions of the ordering source hold. Afterwards, the modal existentially quantifies over the most ideal worlds of the modal base.

Let us see in details the process of computing the modal *qad* with its imperfective VP complement below. For simplicity, I will use an English sentence at LF for the embedded VP complement, (114).

- (114) $\text{ʕomar qad yiktub} \quad \text{ʔal-risaalah.}$
 Omar qad 3.SG.M.write.IMPFV. the-letter
- a. Omar qad writes the letter.
- b. qad [Omar writes the letter]

To see how this works in more detail, consider a toy scenario: Suppose that we have the following set of possible world W , as shown in (115).

$$(115) \quad W = \{ w_1, w_2, w_3, w_4, w_5 \}$$

And, we have the following propositions:

- (116) The propositions below are included in the modal base for the evaluation world w_2 : $f(w_2)$.

k. = {w: Omar waters the plants in w}

r. = {w: Omar writes the letter in w}

t. = {w: July 1st is Canada day in w}

(117) So, $f(w_2) = \{k, r, t\}$

Imagine that the above propositions are all true in the following worlds:

k. = {w₁, w₂, w₃, w₄}

r. = {w₂, w₃, w₄, w₅}

t. = {w₂, w₃, w₄}

The second step is to intersect these propositions in the modal base f . The goal of this intersection is to turn the set of propositions into set of worlds. This step is a ‘trick’, as Portner (2009) calls it, which Kratzer adjusts in the modal logic. The result of this intersection gives us worlds that are epistemically accessible, as shown in (118).

(118) $\bigcap f(w_2) = \bigcap \{k, r, t\} = \{w_2, w_3, w_4\}$

Back to the modal *qad*, I calculate the preliminary denotation, as shown in (119).

(119) $[[qad [\text{Omar writes the letter}]]] = \lambda w. \exists w' \in \text{MAX}_{g(w)} (\{w_2, w_3, w_4\}): \text{Omar writes the letter in } w' \text{ is true.}$

The final step in the computation of the MA modal *qad* is to rank these worlds to the most ideal worlds that is epistemically compatible to the speaker’s knowledge. Accordingly, the second ingredient in Kratzer’s modal system is a stereotypical background an ‘ordering source g ’ (Kratzer, 1981; Portner, 2009). The ordering source g is generated by evaluating the propositions $g(w_2)$ on accessible worlds. Let us see how this ordering source g works on the MA modal *qad* in (120).

$$(120) \quad g(w_2) =$$

$$m. = \{ w: \text{Omar travels to Disney Land in } w \}$$

$$o. = \{ w: \text{Omar publishes a book in } w \}$$

$$\text{,so } g(w) = \{ m, o \}$$

In order to induce the ordering on the set of epistemic accessible worlds, imagine that the above propositions are true in the following worlds in (121):

$$(121) \quad m = \{ w_1, w_2, w_4 \} \text{ and } o = \{ w_4, w_5 \}$$

As a result, I can identify “best” worlds in $\cap f(w_2)$, as given in (122).

$$(122) \quad \text{MAX}_{g(w_2)} (\cap f(w_2)) = \text{MAX}_{m,o} (\{ w_2, w_3, w_4 \}) = \{ w_4 \}$$

The result of this ranking will give us the following result:

$$(123) \quad w_4 \leq_{g(w_2)} w_2 \leq_{g(w_2)} w_3$$

In this case, w_4 is the most ideal world in $\{ w_2, w_3, w_4 \}$ based on the above ordering in (123).

When I apply the above proposal to the toy example in (124), I obtain the result in (125).

$$(124) \quad \text{ʔomar qad yi-ktub ʔal-rrysaala.}$$

Omar qad 3.SG.M.-write.IMPFV. the-letter

‘Omar might be writing the letter.’ (MA)

$$(125) \quad [[\text{qad} [\text{Omar writes the letter}]]]^w = 1 \text{ iff } \exists w' \in \{ w_4 \}: \text{Omar write the letter in } w'.$$

Sentence (125) will be true if and only if Omar writes the letter in w_4 .

To sum up, I have elucidated the computation of MA sentence where it starts by combining the modal *qad* with its proposition. The modal base f of *qad* is identified as

an epistemic modal base f . Afterwards, I follow Kratzer's lexical entry for the epistemic modal base of *may* where the modal existentially quantifies over possible worlds.

Note that I have not incorporated the role of aspect on the MA modal *qad* in this section. (I will account for the sensitivity of the modal *qad* with aspect in Chapter 4 of this dissertation.) The function f maps possible worlds into a set of propositions that are all true in W . The ordering source g imposes an order on these possible worlds, and it selects the best world that is compatible with what the speaker's know in w .

1.6 Outline of the dissertation

In this section, I briefly go over the chapters of this dissertation, which consists of four chapters (including the current chapter). They are as follows.

Chapter 1, I describe essential ingredients that are needed across-chapters in this dissertation. I illustrate fundamental facts about MA simple sentence structure, types of aspect and verb forms. These facts offer a brief overview about relevant aspects of MA grammar. I also provide a description of MA data with respect to aspect and modals. Aspect and modals are essential ingredients in my research about the interaction between modals and aspect.

Afterwards, I turn the attention into the formal semantics of types of aspect, tense and modals. I start with Kratzer's (1998) system for tense and aspect. I apply Kratzer's tense and aspect on MA modal-free sentences.

For the formal account of modals, I introduce Kratzer's (1981; 1991; 2012) modal system, which is tailored to account for the various flavours of the English modals—as in the case of the epistemic modal *must*, without giving up on a uniformed modal quantificational force. I adopt Kratzer's modal proposal of modality into MA modal sentences. Recall that the application of the Kratzerian system will be modified to capture MA novel

data with root and epistemic modals in Chapters 3 and 4.

Chapter 2, I discuss an interesting phenomenon that takes place between root modals and the perfective. In some languages, it has been reported that the root modal requires its complement to hold in the actual world, rather than in other possible worlds. This effect is obtained when the root modal is associated with the perfective. Bhatt Bhatt (1999) is the first linguist who observes this phenomenon with ability root modals in Hindi-Urdu, and he calls this effect as ‘actuality entailments’ (AEs). Across the chapters of this dissertation, I adopt the same terminology, AEs, when the complement of the modal holds in the actual world with the perfective.

In the same chapter, I explore early works on AEs, which is the result of the interaction between root modals and perfective aspect by Piñón (2003); Mari and Martin (2007, 2008); Homer (2011a); Hacquard (2006, 2009, 2010, 2014); Alxatib (2015, 2016) Davis et al. (2009) in three languages of the Americas—St’át’imcet (Lillooet), Gitksan and Blackfoot. I show that MA root modal *\gdr* does not diverge from the reported understanding that the event of the root modal complement is actualized with the perfective, unlike the imperfective. In MA, this interaction between the root modal and the perfective also gives rise to AEs.

Chapter 2 contributes insights from MA data to the cross-linguistic literature on the association between root modals and perfective aspect. With respect to the formal semantic of the root modal *\gdr*, I follow Hacquard’s (2006; 2009) proposal. She argues for the relevance of structural height among, epistemic modals, perfective aspect and root modals. She also develops Kratzer’s (1998) lexical entry for the perfective by having a world argument in its restriction. This world argument is bound by a property of event in a root modal complement; therefore, the property of event holds in the actual world.

Under this configuration, the perfective existentially quantifies over the property of event in the root modal complement. The perfective locates the running time of the event with a reference time interval (more details about her proposal will be provided in Chapter 2). To guarantee obtaining AEs, Hacquard proposes a default pragmatic principle ‘preservation of event description’ (PED). The function of PED is to preserve the characterization of events in all worlds.

Finally, Hacquard amends Kratzer’s (1981; 1991; 2012) lexical entry of root modals. Building on these modifications, Hacquard’s proposal helps us to generate AEs when the perfective scopes over the root modal. Therefore, the complement of the root modal holds in the actual world, and AEs are obtained. Epistemic modals, on the other hand, take a higher scope over the perfective aspect, hence AEs are not generated in this configuration.

Chapter 3, I discuss Hacquard’s (2014) recent claim with respect to the immunity of the perfect from triggering actuality entailments (AEs) with French root modals. I also examine Hacquard’s claim about the French perfect relative to MA root modal *\gdr*. In doing so, I investigate the semantics of perfect aspect as described for English by Comrie (1976); McCawley (1981); Klein (1994); Kratzer (1998); Iatridou et al. (2001); Portner (2000, 2003); a.o. Afterwards, I explore studies on the Arabic perfect by Fassi Fehri (2003) and Boneh (2010).

Relative to MA, I argue that the perfect aspect exists in MA aspectual system, but it has not received an adequate attention in the literature of Arabic linguistics. I will show that the MA perfect aspect has various shapes, unlike English. In English, there is one form of the perfect with various interpretations (see the above cited works). In MA, on the other hand, I find that a participle form is one of the MA perfect forms, and it has similar intuitions of the English perfect, as observed by Boneh (2010) for Syrian Arabic

(SA). To do so, I devote Chapter 3 for examining the MA participle *gaadir* of the verbal root modal $\backslash gdr \backslash$, and the results show that the participle modal *gaadir* has analogous intuitions of the English perfect.

Interestingly, the participle modal *gaadir* can combine with auxiliaries *kaan* “to be” and *ṣaar* “to become”. The results of this combination leads to interesting semantic consequences regarding AEs. I find that each auxiliary invokes an independent interpretation of MA perfect. In other words, the MA perfect has various shapes that yield various flavours of the MA perfect. To the best of my knowledge, this puzzle has not been investigated in the literature of AEs as well as Arabic modals and aspect. Accordingly, I argue that there is a semantic role played by the auxiliaries *kaan* and *ṣaar* relative to AEs.

In Chapter 3, I aim to resolve the semantic puzzle of the participle modal *gaadir* with the auxiliaries *kaan* and *ṣaar*. Hence, I consider two formal hypotheses to account for the interaction between the MA auxiliaries with the participle modal *gaadir*. The first hypothesis is in the spirit of Portner’s (2000; 2003) proposal for account for the various flavours of the English perfect. Under Portner’s proposal, I offer the computation of MA examples with auxiliaries. The second hypothesis is built on Condoravdi’s (2001) proposal with respect to the multiple readings of *might have* in English. I also explain the computation of MA auxiliaries in modal and modal-free contexts. At the end of Chapter 3, I offer an evaluation of each hypothesis on the basis of MA data.

Chapter 4, I pursue a formal semantic account for the MA modal *qad*. I also examine the semantic interaction between the modal *qad* and the different aspects in line of the previous works with root modals by Bhatt (1999, 2006); Piñón (2003); Hacquard (2006, 2009, 2014); Mari and Martin (2007, 2008); Homer (2011a); a.o.

My investigation of MA empirical data shows evidence that the modal *qad* has mul-

multiple flavours due to the sensitivity with different types of aspect in the modal's VP complement. I focus on those readings in which the modal *qad* appears to have an epistemic modal flavour. The exact nature of this epistemic modal flavour varies depending on whether the VP complement of the modal *qad* is in perfective or imperfective aspects.

In Chapter 4, I will present scenarios to illustrate the interpretations of the modal *qad* with the imperfective and with the perfective. With the imperfective, an 'epistemic possibility' is straightforwardly obtained. With the perfective, on the other hand, two interpretations are obtained, which both give rise to AEs. The first interpretation indicates the assertion of completion of an action, which I call an 'already reading'. The second interpretation seems to reflect a high degree of epistemic certainty. I call this reading an 'indeed reading'. The 'indeed reading' is the reading that I aim to explain and account in Chapter 4. The 'already' interpretation remains for future work.

To do so, I propose a lexical entry of the modal *qad* as an epistemic modal in light of Kratzer's (1981; 1991; 2012) modal system. Afterwards, I incorporate the role of different types of aspect in the interpretation of the modal *qad* by considering two hypotheses, which are in the spirit of Kratzer (2012) and Homer (2011a). These hypotheses are designed to invoke AEs with the modal's *qad* perfective VP complement. The first analysis has a true epistemic possibility modal base analogical to the English possibility modals *may* and *might*. The second hypothesis builds on an 'actuality entailment operator' (ACT) for 'aspectual coercion' inspired by Homer (2011a). At the end of Chapter 4, I work on an evaluation of these two hypotheses and select the one formal account that best captures the MA epistemic modal *qad*.

In Chapter 5, I summarize my investigation regarding the interaction between MA modals and different types of aspect. I give an overview of my proposals that account for

MA modals—\gdr\, *gaadir* and *qad*—relative to types of aspect. These new proposals offer new insight to the literature of epistemic modality and perfect aspect. I also outline possible future research regarding other MA semi-modals: \lzm\ and *laabud*.

Chapter 2

The formal semantics of the modal

$\backslash gdr \backslash$

2.1 Introduction

In Chapter 2, I will discuss the role of aspect in the interpretation of the MA root modal $\backslash gdr \backslash$.¹ As we have seen in Chapter 1, the modal $\backslash gdr \backslash$ is a verbal modal, displaying morphosyntax typical of verbs. In particular, it displays both aspect morphology and agreement with the subject (as we saw in Chapter 1, the shape of agreement morphology is conditioned by aspect). I will consider that syntactically, the modal projects below tense and aspect. This will be important. I will assume for simplicity that the “subject” projects in the clause embedded under the modal (this will not be important for my analysis.). As discussed earlier in Chapter 1, the embedded clause is always imperfective. Here is a sketch of the structure for the imperfective projecting over the modal:

- (1) [Tense [*AspectPhrase* IMPFV. [*ModalPhrase* $\backslash gdr \backslash$ [...]]]]

This chapter investigates the effect of imperfective aspect versus perfective aspect on the modal reading of $\backslash gdr \backslash$. When the modal $\backslash gdr \backslash$ has perfective aspect, the intuition appears to be that modality has been cancelled. We are making a claim about what has

¹I will use $\backslash gdr \backslash$ “3.SG.M.ABLE.IMPFV.” to refer to the modal verb in a neutral manner.

An illustration is provided in (2).

- In (2), the speaker refers to a past episode when the weather was nice. Asem successfully swam in the lake last week. This ability modal *gidir* entails that Asem manages to swim, and it is impossible to cancel the event after it takes place by continuing the sentence with “but he did not”.

Pioneering observations show that aspect may contribute to the interpretation of the modal, as first was explored by Bhatt (1999, 2006). Bhatt focuses on Hindi-Urdu root modal (see Hindi-Urdu examples in Section 2.3.1), as in (3) versus (4).

- ²(“Is/ was” are identical to Bhatt’s example)

- (4) Yusuf havaii-jahaaz uraa sak-aa (#lekin us-ne havaii-jahaaz nahii uraa-yaa)
 Yusuf air-ship fly CAN-pfv (#but he-erg air-ship Neg fly-pfv)
 ‘Yusuf could fly the airplane, but he did not fly the airplane.’

(Bhatt, 1999, 2006, p.176)

AEs are also found in more familiar languages. Bhatt considers English sentences with *was/were able to* (see Section 2.3.1). , as shown in (5).

- (5) John was able to eat five apples in an hour.

a. Yesterday, John was able to eat five apples in an hour. (Past Episodic)

b. In those days, John was able to eat five apples in an hour. (Past Generic)

(Bhatt, 1999, 2006, p.173)

Example (5) may have one of the following interpretations depending on the contextual input. For an interpretation like (a), reference is being made about a past event or an actuality implication where there is an event that was completed in the past. Any continuation that negates the actuality of the embedded clause is considered false. In an interpretation like (b), on the other hand, there is reference about John’s generic abilities in the past. There are no inferences about the completion or the actualization of the event of eating the apples.

A growing interest in the literature of modality and aspect begins to appear investigating how these two categories can combine in a sentence. The result of this combination gives rise to multiple interpretations of the modal. This interaction between the root modals and types of aspect is obvious in some languages with rich aspectual morphological systems such as Hindi-Urdu and Modern Greek (Bhatt, 1999, 2006) and French and Italian (Hacquard, 2006, 2009). Indeed, MA shows a total compliance with these languages with respect to the semantic interaction between the modal *\gdr* and types of aspect.

Hacquard's proposal is one of the influential studies that are cited in most research on the association of the root modals and types of aspects in the literature of formal semantics. In Section 2.3.3, I present an exhaustive summary of her proposal to generate AEs with the perfective. She argues that the position of the root modal under the scope of the perfective causes AEs for French and Italian, as illustrated in (6) and (7). For French:

(6) Jean pouvait soulever un frigo, mais il ne l'a pas soulevé

‘Jean could-IMPFV. lift a fridge, but he not it has lifted.’

(7) Jean a pu soulever un frigo, #mais il ne l'a pas soulevé

‘Jean could lift a fridge, but he didn't lift it.’ (French, (Hacquard, 2014, p.2))

In what follows, I start the discussion by presenting a detailed description of the multiple flavours of the MA root verbal modal $\backslash gdr \backslash$ with different types of aspects (as illustrated in Section 2.2). In doing so, I compare MA core data with earlier semantic works and some recent approaches on the interaction between root modals and aspect (in Section 2.3). After this extensive illustration of MA core data and the formal semantic approaches, in Section 2.4, I present Hacquard's proposal for triggering AEs with the perfective, which I aim to adapt in my research for the MA modal $\backslash gdr \backslash$ with the perfective. Later, I offer a formal semantic treatment that captures the behaviour of the MA verbal modal $\backslash gdr \backslash$ (in Section 2.5). In the same section, I introduce the machinery of AEs relative to the root modal $\backslash gdr \backslash$ with the perfective. Finally, I conclude the discussion of Chapter 2 in Section 2.6.

2.2 The empirical puzzle of $\backslash gdr \backslash$

This section illustrates the core data of the MA root modal $\backslash gdr \backslash$. I start the discussion with three possible readings of the MA root verbal modal $\backslash gdr \backslash$ with imperfective aspect.

- (9) ti-gdar ti-lʔab bi-playstation
 you.SG.M.-ABLE.IMPFV. you.SG.M.-play.IMPFV. prep.-PlayStation
 ‘You may play PlayStation.’ (MA)

The paraphrase of (9) would be similar to the following statement in (10).

- (10) You are allowed to play PlayStation (when you have finished your math assignment).

Having demonstrated the possible flavours of the root modal $\backslash gdr \backslash$ with the imperfective aspect, I offer one more flavour of the same modal, but with the perfective. Let us suppose the scenario above where Fatima had already skated on the Rideau Canal. Nova’s parents are wondering if Fatimah had the chance to skate before the end of the skating season on the Rideau Canal.

- (11) Fatima gidrat titzallaʒ ʔala r-rideau canal
 Fatima ABLE.3.SG.F.PFV. 3.SG.F.skate.IMPFV. on the-Rideau Canal
 ‘Fatima managed to skate on the Rideau Canal.’ (MA)

In (11), the root modal *gidrat* is inflected with perfective aspect, signalling that the event of skating has been completed by Fatima at some time in the past. It is not possible to cancel the completion of the event by simply saying *Fatima did not skate*.

With the imperfective, on the other hand, the modal $\backslash gdr \backslash$ does not invoke an actualization of the event, as shown in (12). Accordingly, cancelation of the embedded clause is not problematic.

- (12) ʔasem yi-gdar yi-sbafi fi l-bufiayrah.
 Asem 3.SG.M.-ABLE.IMPFV. 3.SG.M.-swim.IMPFV. in the-lake
 ‘Asem is able to swim in the lake, (but he will not do it).’ (MA)

The reading that arises with the perfective shows that the root modal has an ‘implicative reading’ which gives rise to AEs (as first discovered by Bhatt (1999; 2006) in his disser-

tation). I will provide a detailed description of some of the prominent works on AEs later on, in Section 2.3.

Given the above examples, I have demonstrated possible interpretations of the MA root modal $\backslash gdr \backslash$ with aspectual morphology: the imperfective and the perfective. However, I am interested in the AEs that is obtained with the perfective. Given the description of MA core data of the root modal $\backslash gdr \backslash$ relative to perfective aspect, I intend to answer the following questions:

1. Does the perfective cancel the root modal component of $\backslash gdr \backslash$?
2. What is the semantic computation of the MA root modal $\backslash gdr \backslash$ with perfective aspect?

My main goal in Chapter 2 is to answer the above questions regarding the MA root modal $\backslash gdr \backslash$ with the perfective in light of previous works, which the following discussion focuses on.

2.3 Early observations on actuality entailments

This section aims to survey the semantic behaviour of a root modal that enters into an interactive relationship with aspectual morphology. It explores the way semanticists have treated this type of interaction cross-linguistically. I start my research with the first attempt in Bhatt's (1999; 2006) dissertation in relation to the Hindi-Urdu root ability existential modal *sak*.

For Bhatt, the root modal *sak* is treated as an implicative verb when it is combined with the perfective. This association of the implicative verb with perfective aspect gives rise to AEs. When perfective morphology is associated with the ability modal *sak*, the

proposition expressed by the modal complement holds in the actual world. This actualization of the event does not hold with the imperfective. With the perfective, an assertion is being made about a state of affairs that has necessarily happened at some time in the past. Once the event is actualized, it is not possible to cancel this event.

After Bhatt (1999, 2006) generalization, semanticists became very interested in this type of interaction between modals and aspect. I will give a brief overview of another early work by Piñón (2003). Later on, other semanticists developed formal analyses to account for the same phenomenon Hacquard (2006, 2009, 2011, 2014), Mari and Martin (2007, 2008), Homer (2011a), Alxatib (2015, 2016), and for the phenomenon in three languages of the Americas—St’át’imcet (Lillooet), Gitksan and Blackfoot (Davis et al., 2009).

Based on my analysis of these earlier approaches, I can conclude that Bhatt, Piñón and Hacquard share one view of the root modal with the perfective. With the perfective, they treat the root modal as an implicative verb which signals some efforts made by an agent. The event expressed by the proposition of the root modal has to be completed. However, each one of them offers a different approach to trigger AEs with the perfective.

Mari and Martin (2007, 2008) and Homer (2011a), on the other hand, have a different approach to generate AEs. Mari & Martin claim that AEs are naturally conceived by the perfective since the latter always refers to bounded events. Unfortunately, they do not provide us with a formal statement for computing AEs with the perfective. Instead, Mari & Martin challenge Hacquard’s proposal by introducing some counterexamples where AEs are blocked. Homer analyzes these counterexamples and offers a formal account for generating AEs on the basis of an ‘aspectual coercion’ phenomenon. He claims that the root modal has a stative property, so it is coerced by the perfective, which has a

bounded property. Therefore, Homer proposes an ACT operator to trigger AEs with the root modals and perfective aspect in French.

With respect to semantic approaches to Arabic data, there is a poverty of research on the association between Arabic root modals and types of aspect. The only research that investigates this phenomenon is by Alxatib (2015, 2016) on Palestinian Arabic. The work of Alxatib provides some fruitful insights regarding the absence of AEs with the nominal form *ʔaadir* of the root modal *yiʔdar*. I will formally investigate this nominal form *gaadir* in MA in Chapter 3. Furthermore, I will relate the nominal form to Hacquard’s response regarding Mari & Martin and Homer’s counterexamples.

To make the discussion easier to follow, I will follow Hacquard’s (2006, 2009) proposal for the structural height between the root modal and the perfective (proposed for the French and Italian data). The same proposal will be used for the MA empirical puzzle. This scope position of the perfective triggers the selection of one actual world where the property of the event is completed. Hence, AEs are always triggered with the perfective, but they are absent with the imperfective. I will provide further details regarding Hacquard’s proposal (as explained in Sections 2.3.3 and 2.4.1) and MA *\gdr* (as illustrated in Section 2.5).

2.3.1 Bhatt (1999, 2006)

I will briefly discuss the first attempt at explaining AEs with the perfective by Bhatt (1999, 2006). Since he is a predecessor to Hacquard (2006, 2009) I start the discussion with Bhatt’s famous example where the root ability modal *sak* is inflected with the imperfective morphology, as shown in (13), and with the perfective morphology, as shown in (14).

- (13) Yusuf havaii-jahaaz uraa sak-taa hai/thaa (lekin vo havaii-jahaaz nahii
 Yusuf air-ship fly Can-impfv be.Prs/be.Pst (but he air-ship Neg
 uraa-taa hai/thaa)
 fly-impfv be.Prs/be.Pst.
 ‘Yusuf is / was able to fly airplanes but he does not / did not fly airplanes.’³

(Bhatt, 1999, 2006, p.176)

For the imperfective, the root modal *sak* is able to have two readings, as in (11). For the first interpretation, the speaker is making reference to Yusuf’s present capability of flying airplanes. The sentence is compatible with cancelling the event by adding ‘he does not fly’. Remember that AEs are never available with the imperfective. For the second interpretation, the intuitions that are obtained are relevant to Yusuf’s general ability. These days, Yusuf has the skill to fly airplanes, which entails the generic reading of the root modal *sak*. The situation with the perfective is different:

- (14) Yusuf havaii-jahaaz uraa sak-aa (#lekin us-ne havaii-jahaaz nahii uraa-yaa)
 Yusuf air-ship fly CAN-pfv (#but he-erg air-ship Neg fly-pfv)
 ‘Yusuf could fly the airplane, but he did not fly the airplane.’

(Bhatt, 1999, 2006, p.176)

For the perfective marker, the generic interpretation is not available with the root ability modal *sak*, as illustrated in (14). Bhatt points out that the result of suffixing the root modal *sak* with the past-perfective morpheme yields actualization of the event, as shown in (14). We cannot say “Yusuf did not fly airplanes” after stating that he completed the event of flying airplanes. In other words, it is not possible to claim that the event is completely over, and later cancel the same event. Note that with the perfective morphology on the root modal *sak*, the root modal does not hold its generic reading.

Bhatt (1999, 2006) further claims that the modal *sak-PFV* is not an ability modal with perfective aspect. Rather, it is an implicative verb that simply means an effort was made

³(“Is/ was” are identical to Bhatt’s example.)

to do a particular event, receiving what he calls an ‘implicative reading’. Bhatt suggests a non-technical semantic treatment for the interaction of the root modal *sak* with aspectual morphology in Hindi-Urdu. Bhatt’s focus is not on the compositional derivation. Rather, he assumes the existence of two operators, each of which is anchored with one type of aspect, and his generalization works as follows.

First, based on his claim that *sak* is not an ability modal but rather an implicative verb, he proposes an ‘*ABLE* operator’. The *ABLE* operator maps to perfective aspect. Therefore, it entails the ‘managed to’ reading; the *ABLE* operator is always associated with AEs with the perfective.

Second, to obtain the ability modal interpretation with *sak-IMPFV*, a higher operator scopes over the *ABLE* one, and he calls it a ‘generic operator’ (GEN). As a result, both the generic reading and the ability reading are available with imperfective aspect.

Bhatt is not very explicit about the exact denotation of the two operators in the Hindi-Urdu system. Instead, he provides an example with the English ability modal *be able to*, which bears two readings. For the transparent implicative reading, the speaker states that John ate five apples with some effort in an hour yesterday, as shown in (15).

(15) John was able to eat five apples in an hour. (Bhatt, 1999, 2006, p.159)

The paraphrase of sentence (15) is given in (16).

(16) Yesterday, John was able to eat five apples in an hour.

For the non-implicative reading, the intuitions refer to John’s generic ability in the past. Back in those days, he could eat five apples in an hour, as illustrated in (17) and ??.

(17) Back in those days, John was able to eat five apples in an hour.

(Bhatt, 1999, 2006, p.170)

Based on the above statements, a prediction is made when GEN is absent with *sak* in Hindi-Urdu perfective aspect: it is assumed that the ability reading is not obtained from the ability modal since it has an implicative base. The GEN operator is added to the *ABLE* operator to yield the generic and ability readings.

Although Bhatt's discovery sheds some light on an interesting semantic phenomenon, his solution has some shortcomings. For instance, Bhatt does not explain the reason for losing the implicative reading with imperfective aspect. The only way to acquire the implicative reading of the ability modal *sak* is when it is associated with perfective morphology. Also, we need a more sophisticated formal account for invoking AEs with the perfective. Therefore, later studies acknowledged his discovery for French and Italian, but they competed to offer formal accounts for his observation (as we will see in the following discussion).

2.3.2 Piñón (2003)

The second important processor to Hacquard is by Piñón (2003). I will briefly summarize his proposal, but the reader is referred to his paper for details.

Piñón examines the same phenomenon observed by Bhatt (1999, 2006) but with the English root modal *be able to*. For Piñón, the past form of the English root modal *be able to* is ambiguous between two readings. The first reading is an 'ability reading', as shown in (18).

(18) In her early twenties, Rebecca was able to swim across Lake Balaton.

(Ability reading, (Piñón, 2003, p.384))

The paraphrase of (18) is, it is true that Rebecca was a good swimmer during her twenties when she was able to swim across Lake Balaton, as shown in (19).

(19) In her early twenties, Rebecca had the ability to swim across Lake Balaton.

(Ability reading, (Piñón, 2003, p.384))

The second reading, on the other hand, is an ‘opportunity reading’, as shown in (20). In (20), the event of swimming is located at a specific time in the past. Note that the time period of the swimming event is short compared to the one in (18). The paraphrase of the root modal *be able to* is “had the opportunity to”.

(20) Yesterday afternoon, Rebecca was able to swim across Lake Balton.

(Opportunity reading, (Piñón, 2003, p.386))

Given the two readings of the root modal *be able to*, the opportunity reading is always associated with events that were instantiated and were completed in the past as well. Therefore, this reading refers to what he calls ‘actuality implication’.

The ability reading, as presented earlier in (18), does not assert that the completion of swimming took place yesterday afternoon. The concept of completion is assumed to be absent in the ability reading. As a result, actuality implication may not arise with the ability reading as Piñón describes in (21).

(21) “*be able to* has two readings, ability *able* and opportunity *able*. With ability *able*, there is no actuality implication. With opportunity *able*, in contrast, there is an actuality implication in the past tense but not in the present or future tense.”

(Piñón, 2003, p.388)

Piñón (2003) states that contextual and pragmatic knowledge are predicted to provide clues for the interpretation of the root modal *be able to*— the opportunity or the ability readings. Relative to actuality implications, the semantic reason for this difference between the two readings is due to a scope effect. With the ability reading, tense takes scope over the root modal. With the opportunity reading, the root modal takes scope

over tense. The reader may refer to Piñón (2003) for further details. However, Hacquard (2006) points out that Piñón does not correlate the implicative reading with perfective aspect, which was first suggested by Bhatt (1999, 2006). Hacquard's proposal aims to address this shortcoming.

2.3.3 Hacquard (2006)

Hacquard's (2006) dissertation takes Bhatt's (1999; 2006) observation a step further and examines in depth the association of the root modal with aspectual morphology in French and Italian. She also adopts some classical proposals regarding the structural height between modals and aspect Cinque (1999). Hacquard develops a sophisticated semantic machinery, which will be illustrated in this section, to trigger AEs with the perfective. Before I introduce her machinery for invoking AEs with the perfective, I present Hacquard's core data below.

First, she argues that AEs are not restricted to only one type of root modals, namely ability modals. They are also able to arise with other types of root modals (non-epistemic modals) such as goal-oriented and necessity modals. Her argument is based on evidence found in French and Italian, as shown from (22) to (25).

(22) Jean pouvait soulever un frigo, mais il ne l'a pas soulevé
 Jean could-IMPV lift a fridge, but he not it.has neg. lifted

(23) Jean a pu soulever un frigo, (#mais il ne l'a pas
 Jean has could(PFV)lift a fridge, (#but he not it.has neg. lifter)
 soulevé)

'Jean could lift a fridge, but he didn't lift it.' (Hacquard, 2014, p.2)

(24) Pour aller au zoo, Jane devait prendre le train
 To go to the.zoo, Jane must-past-IMPV take the train

- (25) Pour aller au zoo, Jane a.dû prendre le train
 To go to the.zoo, Jane must.past-PFV take the train
 (Hacquard, 2006, p.14)

With perfective aspect, both the goal-oriented (possibility modal) in (23), and the deontic modal (have/has to, must) in (25) have AEs. It is true that events of “lifting a fridge” and “taking the train” are actualized by the agents. Hence, cancelling the completed property of events is definitely false with perfective aspect, as in (26).

- (26) Gianni ha.voluto parlare a Maria, (#ma non lo hafatto)
 Gianni want-past-PFV talk to Maria, (#but not it do-past-PFV)
 (Hacquard, 2014, p.16)

On the basis of the above examples, AEs are not restricted to ability modals as found in Hindi-Urdu by Bhatt (1999), rather AEs are extended to include other types of root modals with the perfective. This is important since, as we have seen in Section 2.2, the modal *\gdr* has both ability and deontic readings.

Second, contrary to Bhatt’s (1999, 2006) claim that the implicative verbs lose their “managed to” component with the imperfective, Hacquard provides evidence that this is not the case, as in (27).

- (27) Darcy réussissait à soulever cette table, #mais il ne la.soulevait pas
 Darcy succeed-IMPFV. to lift this table, #but he didn’t lift-IMPFV.it pas
 (Hacquard, 2006, p.71)

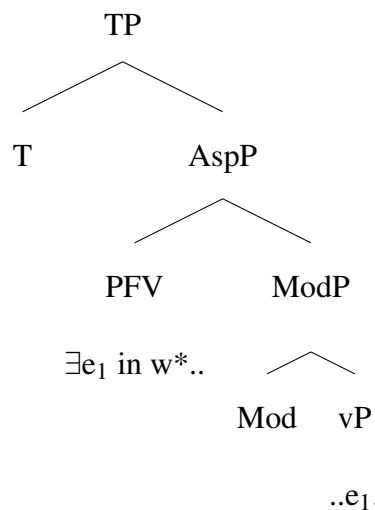
Third, she also points out that imperfective aspect has ambiguous readings in French in a modal-free context. The sentence may refer to a habitual event, a progressive one or a generic reading. Hacquard focuses on the generic and the habitual readings in her proposal with the imperfective (readers can refer to Hacquard’s (2006; 2009; 2014) original papers with respect to the imperfective ambiguity in French and Italian).

Given the fact that AEs are always anchored with the perfective, perfective aspect is

considered to be a crucial ingredient in her proposal. Hacquard follows Kratzer's (1998) proposal for computing imperfective and perfective aspect, as well as modality. However, the case of the interaction between modal and aspect is not explored by Kratzer. Given that the issue of modal-aspect association emerged in the literature of modality, Hacquard (2006, 2009) amends Kratzer's lexical entries in virtue of French and Italian aspect-modal associations. I will discuss the details of Hacquard's proposal in Section 2.4.1 of this chapter. We will see the way Hacquard develops Kratzer's perfective and root modal lexical entries to invoke AEs.

Hacquard distinguishes two cases when a modal is inflected with aspectual morphology, corresponding to root versus epistemic modals. In the first scenario, aspect is above the modal in the sentence. This aspect position results in AEs, as in (28):

(28) Low (root) modal:



There is an actual event (which in some/all acc. worlds....) (Hacquard, 2009, p.285)

In (28), the modal phrase appears below aspect. As is shown in the tree, perfective aspect specifically quantifies over events. The world pronoun variable picks out the actual world. This aspect position entails that the event exists in the evaluation world.

In addition, Hacquard proposes a default pragmatic principle that preserves the char-

acteristics of the events across worlds. She describes this pragmatic principle, as in (28).

- (29) “We obtain an actual event, which in some/all accessible worlds is a P-event (where P stands for the denotation of the VP). This does not quite derive the full actuality entailment (i.e., an actual P-event). To do so, I will invoke a pragmatic assumption (*Preservation of Event Description*), which states that the same event keeps its description across worlds, unless otherwise (morphologically) indicated (as with counterfactual).” (Hacquard, 2009, pp.285-286)

Let us look at Hacquard’s toy example in (30) and follow the way she computes AEs with the perfective.⁴

- (30) Jane a pu courir.
Jane was able to.run

- (31) $[_{TP} \text{Past}[_{AspP} \text{Perf}[_{ModP} \text{can } [_{VP} \text{Jane run}]]]]$

We can see the denotation of the modal and the embedded clause below:⁵

- (32) $[[\text{Can}_{cir}]]^{w,B,\leq,c} = \lambda P_{\langle \varepsilon, t \rangle}. \lambda t_i. \exists w' \text{ compatible with circumstances in } w \text{ s.t. } P(w')(e)$

- (33) $[[[_{ModP} \text{can } [_{VP} \text{Jane run}]]]^{w,B,\leq,c} = [[\text{Can}]] (\lambda w'. [[\text{Jane run}]]^{w,B,\leq,c}) \text{ (by IFA)}$

a. $= \lambda e. \exists w' \text{ compatible with circumstances in } w: \text{run}(e, J, w')$

- (34) $[[[(30)]]]^{w,B,\leq,c} \text{ is true iff } \exists e[e \text{ in } w \wedge \tau(e) \subseteq t < t^* \wedge \exists w' \text{ compatible with the circumstances in } w \text{ s.t. } \text{run}(e, J, w')]$

“There is an event in the actual world located in a past interval, and there is a world

⁴More detail will be provided in the discussion of the MA in Section 2.4.

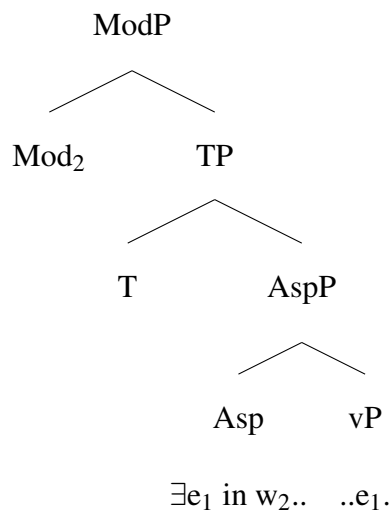
⁵In what follows, I will use ℓ or ε for the type of events.

compatible with the circumstances in the actual world where that event is a run by Jane.”
(Hacquard, 2009, pp.296-297)

At this level of the computation, a question arises as follows: what is the technique that guarantees having AEs under the above configuration in (28)? The answer to this question is given by Hacquard through applying the default pragmatic principle PED, as defined in (28). The function of the pragmatic principle of PED is to hold the property of the event, which is running by Jane, both in the actual world and across worlds. The PED would prevent any additional description to the original event of running in the actual world as well as other worlds. By having PED in the system with the perfective, AEs are generated.

The second case is when aspect is below the modal as in (35). Hence, the modal binds the aspect world variable.

(35) High (epistemic) modal:

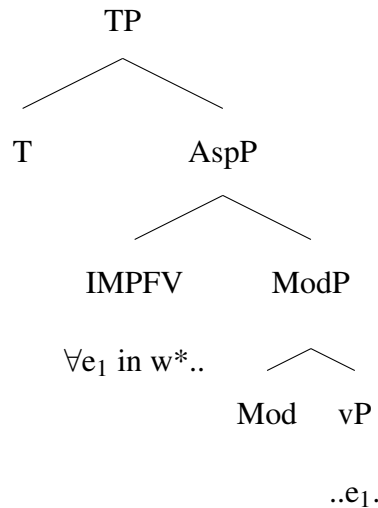


In all/some accessible worlds in w_2 : there is an event in w_2 (Hacquard, 2009, p.286)

In (35), in contrast with the previous example, a modal occurs in the reverse position; the epistemic modal is above aspect. The epistemic modal binds possible worlds below including the aspect world argument. Consequently, AEs cannot be obtained in the configuration in (35) (with epistemic modals).

For imperfective, this aspect shows ambiguity among generic, habitual, counterfactual and progressive readings. Hacquard focuses on habitual and generic readings in her proposal. In her system, the imperfective aspect introduces a modal quantification force as well as a generic and habitual one, as in (36).⁶

(36) Low (root) modal:



In all ‘generic’ worlds w_2 , all events in w_2 (are such that in some/all acc. worlds...)
(Hacquard, 2009, pp.286)

(37) $[[\text{Imperfective}]]^{w,B,\leq,c} = \lambda P_{\langle \varepsilon, t \rangle}. \lambda t_i. \forall w' \in \text{MAX}_{<_w} (B_w); \forall e [e \text{ in } w' \wedge \tau(e) \approx t: P(w')(e)]$

(38) Cette machine pouvait écraser les oranges
This machine can-impfv. crush oranges

(39) [past [Impfv. [can [machine crush oranges]]]]

“In all most normal worlds w among those compatible with the engineer’s intentions in w^* , for all past events e of using the machine in w , there is world w' compatible with the circumstances in w such that e are orange-crushing events in w' ”
(Hacquard, 2009, p.304)

To sum up, Hacquard achieves her goal of triggering AEs when the root modal inter-

⁶For the denotation of the ‘perfective’, see Section 2.4.1.

acts with the perfective in French and Italian. This can happen when the perfective scopes over the root modal, preventing the original event from having any additional or modified descriptions in the evaluation world and across worlds. This sophisticated proposal is the one which I aim to adopt for my analysis of MA root modal \gdr\ with the perfective in Section 2.5.2⁷.

Mari and Martin (2007, 2008) and Homer (2011a) have challenged the cancellation of the AEs with root modals and perfective aspect in very restricted contexts. I will discuss their counterexamples where AEs can be cancelled in the following discussion, and their proposals to overcome these challenges.

2.3.4 Mari and Martin (2007, 2008)

Mari and Martin (2007, 2008) provide an alternative account for the relation between the root modal and perfective aspect in French. They have a different approach from Hacquard (2006) regarding the causes of AEs. However, they still believe that the root modal has an implicative element. Their analysis offers the implicative reading not only with the perfective but also with the imperfective. In what follows, I present their view regarding AEs and their critique of Hacquard's (2006) proposal.

Mari and Martin (2007) claim that Hacquard's (2006) proposal does not account for counterexamples where AEs are blocked with circumstantial readings in the perfective. Their claim is based on types of counterexamples that do not trigger AEs. Like Bhatt (1999; 2006), Mari & Martin treat the verbal modals *a pu* 'could.PFV.' and *pouvait*

⁷It is important to highlight that the "effort" component is present with the perfective, but it is missing with the imperfective. In Bhatt(1999; 2006), the root modal "be able to" has an implicative base with the perfective. It asserts that the modal's complement holds in the actual world and presupposes that it was effortful. The imperfective lacks the "effort" component since the imperfective refers to a 'habitual reading' or a 'generic reading'. Hacquard (2006) proposes to derive the "effort" component of perfective as an implicature, and I will follow her in this assumption.

‘could.IMPFV.’ as implicative verbs where some efforts are being made to complete the event in the perfective. With the perfective, the readings of those verbal modals would give rise to AEs.

Mari and Martin (2007) distinguish between the properties of perfective *passé composé* and imperfective *imparfait* in French. The *passé composé*—by default—indicates that the event has reached its final stage of completion or its final boundaries. The *imparfait*, on the other hand, entails that the event has not been finished yet, and it is predicted to continue.

Due to the properties of the perfective, the event has been completely carried out. Therefore, it is feasible to associate perfective aspect with a ‘boundedness constraint’ responsible for triggering AEs. The imperfective, on the contrary, is always associated with the property of events that have not been finished. It is possible to link this property of imperfective aspect with an ‘unboundedness constraint’. Therefore, AEs are naturally blocked with the imperfective.

Mari & Martin explain the main reasons for not generating AEs with the perfective, contra to Bhatt (1999, 2006) and Hacquard (2006). The root verbal modal, which might be inflected with a bounded element *passé composé*, may combine with a complement that has a temporal element or a stative property, as explained in (40).

- (40) “The AE is triggered when the eventuality *v* described by the matrix verb (i) is the only one which can satisfy the ‘boundedness constraint’ associated with the *passé composé* under its two readings and (ii) ontologically depends on an action satisfying the description given in the infinitive. If another eventuality *v*’ which does not depend on such an action *a* can satisfy the boundedness constraint, the AE is not compulsory (HYP.1)”

Let us see the way the above description is articulated in their counterexamples. The first type is when the event in the complement has temporary references, as shown in (41).

- (41) la carte a permis pendant dix minutes seulement d'entrer dans la bibliothèque.
OK Mais stupidement je n'en ai pas profité.

'The card permitted.PERF. for ten minutes only to enter the library. But stupidly,
I didn't enjoy the opportunity.'

(Mari and Martin, 2007, p.153)

In (41), there is a scenario where the speaker had the permission to enter the library for only 10 minutes. For some reason, the speaker missed this chance. The actual use of the facilities in the library are restricted only to 10 minutes, which have not been used.

Another counterexample that shows the relevance of a temporal element inside the complement of the modal is given in (42). In (42) below, the perfective morphology appears on the root modal, which naturally conceived as bounded to trigger AEs. However, the use of the adverbial *à un stade bien précis de son développement* forces AEs to disappear.

- (42) Notre nouveau robot a même pu repasser les chemises à un stade bien précis de son développement. OK Mais on a supprimé cette fonctions (qui n'a jammais été testée) pour des raisons de rentabilité.

'Our new robot could.PERF. even iron shirts at a particular stage of its development. But we suppressed this function (which was never tested) for rentability reasons.'

(Mari and Martin, 2007, p.153)

In (42), there is a scenario where a speaker buys a new robot; the robot is designed to iron shirts at specific stage. Later, the speaker has decided to remove this option. As a result of removing this option, the robot is performing a special function which is not the usual one i.e. as an exception. Hence, the actualization that is assumed to be carried out by the root modal *pu* is blocked due to the suppression of this particular option.

The second type of example where AEs are not generated is when the complement includes a stative predicate, as shown in (43).

(43) T'as pu avoir un repas gratuit, et tu ne t'es même pas levé!

‘You could.PERF. have a meal for free, and you even didn’t get up!’

(Mari and Martin, 2007, p.153)

In (43), the first event of getting a free meal has not been actualized. If the addressee got up, s/he could have had the free meal. Example (43) reminds us of a ‘counterfactual reading’.

Turning our attention to the MA verbal modal *\gdr*, I examine Mari & Martin’s (2007) approach relative to the semantic behaviour of *\gdr*. I follow their reasoning regarding causes of blocking AEs by constructing equivalent MA examples with *\gdr* in (41). Some adjustments are needed to construct the examples.

First, when the temporal elements is added in the infinitival complement, the MA example will look like this, as in (44).

(44) #ʔal-biṭagah gidrat tistaxdim l-maktabah
 ʔthe-card.SG.F. ABLE.3.SG.F.PFV. use.3.SG.F.IMPV. the-library
 li-muddat ʕaʕara dagaayg fakaʕ, bas Dayaʕt l-furṣah.
 for-duration ten minutes only, but miss.PFV.I. the-chance
 ‘The card managed to use the library only for 10 minutes, but I missed it.’

(MA)

In (44), the noun phrase ‘the card’ is assumed to have a [-animate] feature, which causes a mismatch with the requirement of the verbal modal *\gdr*, which requires some efforts from the agent. Only a [+animate] agent can satisfy the requirements of the verb. However, MA speakers have an alternative way of saying Mari & Martin’s example, as in (41). This alternative way, as in (45), is by the use of a modal verb that is *smafi*, ‘permits’, to follow Mari & Martin’s argument, as previously illustrated in (41).

- (45) ʔal-biṭagah smaḥiat li bi-stixdaam l-maktabah li-muddat
 ʔthe-card.SG.F. permit.3.SG.F.PFV. me prep.-use the-library for-duration
 ʕafara dagaayg fakaṭ, bas Dayaṭ l-furṣah.
 ten minutes only, but miss.PFV.I. the-chance
 ‘The card permitted me to use the library only for 10 minutes, but I missed it.’

(MA)

I can also amend Example (44) by alternating the noun phrase from “the card” into “Asem”. The agent “Asem” has a [+animate] feature. This feature is compatible with verb requirement where some efforts are made by the agent (e.g. Asem), as in (46)⁸.

- (46) ʕasem kaan yigdar yis-taxdim biṭaagah
 Asem kaan.3.SG.M. ABLE.3.SG.M.IMPV. use.3.SG.M.IMPV. card
 haggat l-maktabah li-muddat ʕafara dagaayg fakaṭ, bas Dayaṭ
 its the-library for-duration ten minutes only, but miss.3.SG.M.PFV.
 l-furṣah.
 the-chance
 ‘Asem could have used the library’s card only for 10 minutes, but he missed it.’

(MA)

Second, I observe that Example (45) is ambiguous. For convenience, I repeat the MA equivalent example in (47).

- (47) ʔal-biṭagah smaḥiat li bi-stixdaam l-maktabah li-muddat
 ʔthe-card.SG.F. permit.3.SG.F.PFV. me prep.-use the-library for-duration

⁸The type of aspect in Example (48) seems to be perfect aspect, which shows analogy to Fassi Fehri’s (2003) perfect for Moroccan Arabic (see Chapter 3 in Section 3.1.3 for further discussion).

ʕafara dagaayg fakaʔ, bas Dayaʕ l-furʕah.
 ten minutes only, but miss.PFV.I. the-chance
 ‘The card permitted me to use the library only for 10 minutes, but I missed it.’

(MA)

The first reading occurs when the speaker misses the ten minutes permission at some-time in the past, which displays a ‘transparent interpretation’. Failure to use the card within the ten minutes does not satisfy AEs. The second reading happens when the use of the ten minutes is unrestricted to the past time, which represents an ‘opaque interpretation’. The ten minute use of the card is not located in the past time interval. The card can still be used for ten minutes not in the past, but also in the present or in the near future.

To sum up, Mari and Martin (2007, 2008) analyze counterexamples to Hacquard’s proposal. However, they are not explicit about the formal system of blocking AEs for both contexts—temporal elements and stative predicates—inside the infinitival complements. I have found in MA potential problematic examples for Hacquard’s proposal like the ones noted for French. How to incorporate this into the analysis remains for future research. The following approaches offer more alternative proposals for accounting for AEs; they treat the root verbal modal as a stative predicate instead of as an implicative verb.

2.3.5 Homer (2011a)

One of the works that diverges from Bhatt’s (1999; 2006) treatment of the root modal as an implicative verb with perfective is by Homer (2011a) on French. Homer establishes his proposal for acquiring AEs by considering the properties of perfective aspect—the boundedness constraint—as described earlier in Mari and Martin’s (2007; 2008) work. He puts their proposal forward and offers a more formal semantic account: he proposes an operator that is responsible for triggering AEs. Like Mari and Martin (2007, 2008), Homer claims that AEs can be cancelled even if the statement has the combination of the

root ability modal and perfective aspect. Let us see how he formally develops Mari & Martin's (2008) boundedness constraint.

Homer (2011a) observes that a stative predicate can give rise to AEs with the perfective in French, as shown in (48). Given the fact that the perfective requires “bounded” eventualities, the properties of events have to be associated with actions. For instance, ‘costs’ does not entail action or instantiation, but rather a stative predicate. As a result, a clash occurs between the perfective aspect requirement and a stative predicate in (48). This phenomenon of incompatibility between perfective and stative predicate gives rise to ‘aspectual coercion’ (Homer, 2011a; Hacquard, 2014).

(48) la maison a coûté 100, 000 € (The house has cost 100, 000 €)

‘The house was bought for 100, 000€.’ (Homer, 2011a, p.6)

To rescue this clash, an *actuality entailment operator* (ACT) is triggered to enrich the system (Homer, 2011a). The ACT operator merges between the predicate of eventualities and perfective aspect. This operator will take the stative predicate and return a bounded one to satisfy the perfective selectional restriction, as shown in (49).

(49) $[[ACT]]^{c,s} = \lambda P_{\langle vt \rangle}. \lambda Q_{\langle vt \rangle} \lambda w_s. \lambda e_v. Q(e) \wedge e \text{ in } w \wedge \forall e'_v [e' \sqsubseteq e \rightarrow \neg Q(e')]$
 $\wedge \exists e''_v [P(e'') \wedge \tau(e) = \tau(e'')]$

The operator combines with a property of events P and the result is another property of events Q identified by context. Q is true of events e in w, not of subparts of e. Moreover, there is a P-event with the same running time as the Q event. Even though a stative P event combines with the ACT operator, the event that enters composition with perfective is another, non-stative event that has the same running time. This other event is contextually identical. In this way, for example, stative “cost” is coerced to event ‘buy’.

Homer has a different view from Hacquard’s (2006; 2009) proposal regarding the way AEs are triggered, which I earlier illustrated in Section 2.3.3. He claims that AEs are not always mandatory when the root modal is under the scope of the perfective. There are genuine counterexamples that challenge Hacquard’s proposal for generating AEs. According to Homer, if there exists an unresolvable clash between the perfective, which has a bounded property, and the stative root modal, AEs are not generated, as shown in (49). The presence of the adverbial *à plusieurs reprises* “on several occasions” does not allow AEs to be generated, as in (50).

(50) À plusieurs reprises, Olga a pu_{abil} soulever un frigo, mais ne l’a pas fait.

(Homer, 2011a, p.2)

In (50) above, on several occasions Olga was able to lift the fridge, but she did not. Even though the root ability modal is inflected with perfective, AEs are missing here.

Homer illustrates the way the ACT operator operates in the following toy example, as in (51).

(51) Jane a pu_{circ} prendre le train.

(52) LF of ((51)): [λw_1 [_{TP} PRES [_{PERF} [_{VAspP} PFV[w_1 Q₂ ACT[_{vP} w_1 pouvoir[_{CP} λw_3 [w_3 J. prendre-le-train]]]]]]]]]

(53) $[[[(51)]]]^{cs} (w_c) (t_1) = 1$ iff there is a past interval t s.t. there is an eventuality e of $s(Q_2)$ in t in w_c s.t. no proper part of e is an eventuality of $s(Q_2)$, and e is simultaneous with a state in w_c of J. taking the train being possible.

(Homer, 2011a, p.6)

Homer gives the ACT operator value (Q), which acquires its value from the context.

When the root modal that has a stative property is associated with the perfective, aspectual coercion results. Therefore, this coercion triggers the ACT operator to invoke a bounded eventuality (like buying a house) that overlaps with the root modal stative property. The result is AEs.

Homer further claims that the ACT operator resolves the aspectual coercion occurring with French root ability modals. For him, ability modals are naturally stative and not bounded. They are unbounded in the sense that they do not require instantiation or action. By adding the ACT operator to the system, AEs are invoked.

To sum up, Homer offers a different treatment of root modals when they combine with perfective aspect in French. The root modals are stative predicates rather than implicative verbs with perfective aspect. This combination of root modals and perfective aspect causes aspectual coercion. The bounded eventualities overlap with the stative element presented by the root modal, the ACT operator is generated to save the derivation.

Homer's proposal does not show the way the description of the event is preserved, and so why AEs are guaranteed with the perfective. Also, his proposal does not take into account the acknowledged structural relation between the modal and the perfective.

The following work investigates the same association between the root modal and the perfective in Palestinian Arabic (PA) by Alxatib (2016). Alxatib's work is in line with Mari and Martin's (2007; 2008) and Homer (2011a) treatment of AEs with the perfective.

2.3.6 Alxatib (2016)

Alxatib's (2016) work is the only research that relates the above studies to (Palestinian) Arabic (PA). Alxatib observes that the perfective form of the root modal $\backslash?dr\backslash$ in (55), which is similar to $\backslashgdr\backslash$ in MA, invokes AEs. Like MA $\backslashgdr\backslash$, $\backslash?dr\backslash$, as in (56), with imperfective disallows inference to AEs. The PA root modal does not diverge from ob-

servations pointed earlier by Bhatt (1999; 2006) and (Hacquard, 2006, 2009) about the effect of the perfective on the root modal for invoking AEs.

(54) “The PA ability root *?dr* licenses AEs, while in IMP it does not.”

(Alxatib, 2016, p.16)

(55) Ø *?idir jrawafi (#bas ma: rawafi).*
 pro. able.PFV. 3.SG.M-go.home, but NEG. go.home.Past.PFV.
 ‘He could go home, but he didn’t.’ (Alxatib, 2016, p.12)

(56) Ø *ka:n bi?dar jrawafi bas ma: rawafi*
 pro PAST. able.IMPFV. 3.SG.M-go.home, but NEG. go.home.Past.PFV.
 ‘He could go home, but he didn’t.’⁹ (Alxatib, 2016, p.12)

Alxatib also examines a third form of the root ability modal in PA; this third form is a nominal or a participle form that does not license AEs. Recall that I have talked about the participle form of the verbal root modal *\gdr* in Section 1.2.3. I will refer to Alxatib’s nominal term as the participle form for consistency purposes from now on. In PA, the participle *?aadir* is a stative property since it makes references to an unbounded ability by the agent.

(57) Ø *(kaan) ?aadir yaaxod el baas, bas axad el qitaar.*
 pro PAST able.NOM take the bus but took.PFV. the train
 ‘He was able to take the bus, but he took the train.’ (Alxatib, 2016, 19)

In (57), the participle form *?aadir* does not license AEs when it is preceded by an auxiliary *kaan*.

Alxatib states that the participle form is a stative property which does not have a modal semantics. Only the root modal *\?dr* with the imperfective has modality on its

⁹This example is as transcribed by Alxatib (2016) and is considered as imperfective. In Standard Arabic as well as Makkan Arabic, this form “*kaan* verb.IMPFV” gives rise to a counterfactual reading rather than past imperfective. Hence, actuality entailments do not arise. I will examine in detail the presence of the auxiliary *kaan* in Chapter 3.

own. The root modal $\text{\textbackslash?dr\}$ with the imperfective expresses either a generic reading or a habitual reading while $\text{\textbackslash?dr\}$ with the perfective gives rise to AEs. The nominal *?aadir* cannot behave in the same manner as the verbal root modal. Unfortunately, he leaves this empirical puzzle unsolved and suggests future research is needed to examine why AEs are absent with the nominal form.

Alxatib's empirical puzzle is an interesting puzzle to solve relative to MA data. In Chapter 3 of this dissertation, I investigate the formal causes for the absence of AEs with the MA participle *gaadir* in the presence of the auxiliary *kaan*. My analysis shows that the intuitions behind the participle *gaadir* with the auxiliary *kaan* has a 'counterfactual reading'. I summarize the behaviour of the PA root ability modal relative to actuality entailments in the table below:

Perfective	<i>?idir</i>	$\Rightarrow$ AE
Imperfective	<i>bi?dar</i>	$\nRightarrow$ AE
The participle	<i>?aadir</i>	$\nRightarrow$ AE

Table (1). Palestinian Arabic root ability modal

As we can see in Table (1), when the root modal is inflected with the perfective, AEs are always invoked. The imperfective, on the other hand, does not yield AEs. This conclusion is in line with what has been reported for the root modal with imperfective and perfective aspect. With respect to the participle, there is an assumption that an auxiliary is invisible, therefore AEs are not generated. With the presence of the auxiliary *kaan*, AEs are not also generated. In Chapter 3, I will examine the MA participle with two auxiliaries: *kaan* and *saar*, which I aim to account for.

Alxatib's work is a continuation of observation by Mari and Martin (2007, 2008) where AEs are blocked in restricted contexts. As Homer (2011a) characterizes the root

ability modal as a stative predicate, Alxatib uses the PA nominal form of the root modal to support this view about the stative property of the root modal (he follows Homer (2011a) in using aspect shift to obtain AEs in the past perfective). When the perfective is absent, AEs are not triggered.

Under Alxatib's view, the root modal is stative, causing an 'atelic reading', while perfective aspect is reported to reach the final boundaries of completion. When the root modal is associated with perfective aspect, coercion results between the property of the root modal and perfective aspect. Therefore, aspectual shift has to take place to rescue this clash between the stative property of the root modal and the boundedness of the perfective. As we have seen earlier in the discussion of Homer (2011a), one way to rescue the derivation is to merge an ACT operator in the derivation. As a result, the root modal shifts its reading from the atelic reading to a telic one, and the outcome of this aspect shift is actuality entailments.

Relative to MA $\backslash gdr \backslash$, the root modal can also have the active non-past participle form, as shown in (58). The participle form will be *gaadir*, and it does not invoke AEs.

- (58) ʔasem kaan gaadir yaaxoð
 Asem kaan.3.SG.M.PFV. ABLE.participle.3.SG.M. 3.SG.M.take.IMPFV.
 l-baaʃ, bas ʔaxað l-qitaar.
 the-bus, but take.3.SG.M.PFV. the-train
 'He was able to take the bus, but he took the train.' (MA)

The use of the past auxiliary *kaan*, as shown in (58), gives rise to counterfactual reading where AEs are not licensed. This counterfactual reading is obvious with the MA root modal $\backslash gdr \backslash$ with the auxiliary *kaan*, as in (59), similar to the PA example in (56) (Alxatib, 2016).

- (59) kaan $\backslash gdr \backslash$ yiruufi l-bayt bas ma:
 kaan.3.SG.M.PFV. ABLE.3.SG.M.IMPFV. 3.SG.M-go. the-home, but neg.

raafi.

go.home.3.SG.M.PFV.

‘He could have gone home, but he didn’t.’

(MA)

To sum up, Alxatib’s (2016) observation supports the same intuitions for MA verbal modal $\backslash gdr \backslash$ and provides insights with respect to my analysis of MA $\backslash gdr \backslash$. He also argues that the nominal form *?aadir* with the auxiliary *kaan* does not generate AEs, but he does not offer a formal explanation for this absence.

Since the MA data and Alxatib’s PA data show parallel intuitions regarding the nominal form with respect to AEs, I will explore the absence of AEs in Chapter 3. I will also incorporate the nominal form *gaadir* with the auxiliary *kaan* into Hacquard’s (2014) analysis regarding cancellation of AEs, which is challenged by Mari and Martin (2007, 2008) and Homer (2011a).

2.3.7 Hacquard’s (2014) view of cancellation of actuality entailments

In the previous section, I discussed some claims regarding the possibility of cancelling AEs even given the combination of the root modal and the perfective (Mari and Martin, 2007, 2008; Homer, 2011a; Alxatib, 2016). According to Mari & Martin and Homer, in those counterexamples, AEs are not available even though the perfective is present on the root modal. Those counterexamples are claimed not to be captured by Hacquard’s (2006; 2009; 2014) proposal.

In response to those counterexamples, Hacquard (2014) examines Mari & Martin (2007; 2008) and Homer’s (2011a) data. Hacquard’s (2014) response relies on the comparison between aspectual morphology in French and other languages that have an obvious distinction between the perfect and the perfective. Hacquard assumes that *passé composé* is still ambiguous and falls between the past perfect and the past perfective. A French speaker uses *passé composé* to express the past perfective. For the perfective, an

event is included in the reference time. The focus is on the completed event. The perfect, on the other hand, locates an event prior to the reference time. In addition, the perfect is reported to have multiple flavours such as a ‘resultative’, an ‘existential’, a ‘communicative’ and ‘hot news’ (Bauer, 1970; Comrie, 1976; Klein, 1994; Kratzer, 1998; Iatridou et al., 2001; Portner, 2003). On the basis of this aspectual distinction, Hacquard claims that the proposed counterexamples are actually examples of the perfect rather than the perfective. AEs arise with the perfective aspect, but not with the perfect.

The French aspectual morphological system is considered morphologically impoverished and ambiguous between perfective and perfect interpretations. Bulgarian, however, has a richer aspectual system. So, Hacquard (2014) examines cancellation of AEs with Bulgarian root modals to support her argument that the perfective always gives rise to AEs. She extends her test to include some adverbials such as *suddenly* and *for several times* as previously used by Homer (2011a). (The reader may refer to Hacquard’s (2014) paper for the Bulgarian examples.) The results show that the perfective aspect always triggers AEs with root modals even in the presence of the adverbials. Given Hacquard’s view, perfect aspect is immune from AEs. Mari & Martin’s and Homer’s counterexamples are all considered to be in the perfect.

- (60) #Ogla vnezapno mozha da vdigne hladilnika, no ne go napravi
Ogla suddenly can-PFV subjunctive lift-pfv the-fridge, but not it did
- (61) Ogla vnezapno mozheshe da vdigne hladilnika, no ne go napravi
Ogla suddenly can-IMPV
- (62) #Ogla vnezapno e mogla da vdigne hladilnika, no ne go e napravila
Ogla suddenly is can-PFV, perfect
- (63) Olga vnezapno e mozhela da vdigne hladilnika, no ne go e napravila
Ogla suddenly is can-IMPV, perfect

‘Suddenly, Olga could lift the fridge, but she didn’t.’

(Bulgarian, (Hacquard, 2014, p.15)

Given the above examples, they show that the adverbs that seem to block AEs are incompatible with the perfective. When these adverbs are present in French, they are present with the perfect, but not the perfective, so there are no real counterexamples.

To sum up, some challenges arise regarding Hacquard’s (2006; 2009) proposal where AEs are blocked with the perfective; these challenges are raised by Mari and Martin (2007, 2008) and Homer (2011a). Hacquard (2014) has a different view with respect to Mari and Martin’s (2007; 2008) and Homer’s (2011a) counterexamples. Her view is based on the different behaviours of the perfect and the perfective in association with AEs in French.

2.3.8 Conclusion

In this section, I have presented some recent work following Bhatt’s (1999; 2006) dissertation, on AEs. These works can be classified into two broad views. The first view treats the root modal as an implicative verb with the perfective as in Bhatt (1999, 2006), Hacquard (2006, 2009) and Mari and Martin (2007, 2008). Hacquard (2006, 2009) bases her proposal on Piñón’s (2003; 2009; 2011) scope analysis, where the relative height between the tense and the root modal gives rise to AEs with perfective aspect. The second view, on the other hand, treats the root verbal modal as a stative predicate. It relies on generating the ACT operator to account for the aspectual coercion caused by combining the root verbal modal with perfective aspect, as proposed by Homer (2011a) and Alxatib (2016). Finally, I discussed Hacquard’s (2014) response to Mari and Martin (2007, 2008) and Homer (2011a) regarding their claims of cancelling AEs with the perfective.

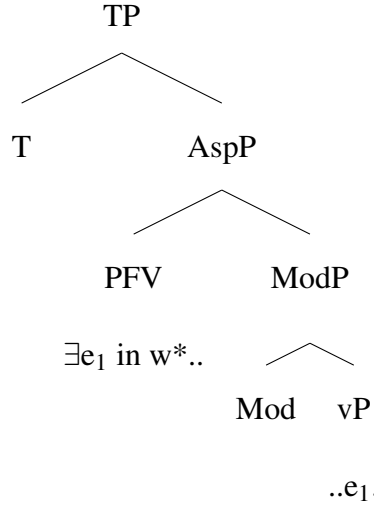
2.4 Formal semantics of $\backslash gdr \backslash$

The formal semantic proposal of $\backslash gdr \backslash$ includes Hacquard's (2006; 2009) proposal regarding the structural height between the root modal and the perfective reported for French. I have explained the way Hacquard derives AEs when the perfective scopes over the root modal for French data in Sections 2.3.3 and 2.4.1. Now, I apply Hacquard's (2006; 2009) system the MA root verbal modal $\backslash gdr \backslash$. I combine the complement with the root verbal modal and the perfective aspect. As we have seen in Chapter 1, the modal $\backslash gdr \backslash$ is a verbal modal.

2.4.1 Hacquard's (2006; 2009) proposal

As explained in Sections 2.3.3 and 2.4.1, Hacquard's (2006; 2009) explains the formal reasons why French root modals receive various interpretations on the basis of the location of aspect relative to the root modals. What is crucial in her analysis and to my analysis of $\backslash gdr \backslash$ is the position of the perfective with respect to the root modal. If the perfective scopes over the root modal, this scope effect gives rise to AEs. I provide more detail here. Recall the structure in (64). In this section, I explicitly illustrate Hacquard's account for invoking AEs.

(64) Low (root) modal:



There is an **actual** event (which in some/all acc. worlds....) (Hacquard, 2009, p.285)

As described by Hacquard for (64), the perfective is located above the root modal, therefore AEs are invoked. Hacquard (2006, 2009)) modifies Kratzer's (1998) perfective by projecting a world binding pronoun (or the world of evaluation) as the perfective's own argument. The motivation behind this modification is to interpret the perfective relative to a world of evaluation, as in (65).

$$(65) \quad [[\text{Perfective}]]^{w, B, \leq, c} = \lambda P_{\langle \varepsilon t \rangle} . \lambda t_i . \exists e . [\underline{e \text{ in } w} \wedge \text{time}(e) \subseteq t \wedge P(e)]$$

(Hacquard, 2009, p.295)

There is one condition that the world binding pronoun has to obey, which is known as the locality principle. The world binding pronoun has to be bound by the closer binder. The function of this world binding pronoun is to anchor the VP event in the actual world.

Recall also that Hacquard proposes the default application of a pragmatic principle 'preservation of event description across worlds' (PED). The function of this pragmatic principle is to preserve the same properties of the event in both the modal worlds and the actual world with the event in the VP in (66).

(66) **Preservation of Event Description (PED):** for all worlds w_1, w_2 , if e_1 occurs in

w_1 and in w_2 and e_1 is a P-event in w_1 , then *ceteris paribus*, e_1 is a P-event in w_2 as well. (Hacquard, 2009, p.298)

The default characterization of PED, as defined in (66), holds the description of the event not only across worlds in the domain of the modal, but also in the actual world. Let us apply this proposal to the following toy example below.

- (67) Jane a pu courir.
 Jane was able.to run
 $[\text{Past } [_{AspP} \text{ Perf } [_{ModP} \text{ can } [_{VP} \text{ Jane run}]]]]$ (Hacquard, 2009, p.296)

Hacquard simplifies the lexical entry for the root modals *pouvoir* “be able”. The simplification relies only on the modal base of the root modal to provide us with the circumstantial background, without the ordering source, as shown in (68).

- (68) $[[\text{Can}_{cir}]]^{w,B,\leq,c} = \lambda P_{\langle s,\ell,t \rangle}. \lambda e_\ell. \exists w' \text{ compatible with circumstances in } w \text{ such that } P(w')(e)$ (Hacquard, 2009, p.296)

By putting all of the pieces together, when the perfective is merged above the root modal, the root modal combines with the VP complement. Before combining the root modal with the VP complement, the semantic type of the VP complement is of type $\langle \ell, t \rangle$. This type has to be converted into type $\langle s, \langle \ell, t \rangle \rangle$ to allow for composition. Following Hacquard, I make the semantic types of the root modal and the VP complement compatible with each other by applying the ‘Intensional Functional Application’ (IFA) Kratzer and Heim (1998), as defined in (69). The role of IFA is to shift the semantic type of the VP complement into type $\langle s, \langle \ell, t \rangle \rangle$. Since we are dealing with possible worlds, the type of worlds has to be of type s , which is available in the latter type, as illustrated in (69) and (70).

- (69) **Intensional Functional Application (IFA):** if α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any possible world w , if $[[\beta]]^w$ is a function

whose domain contains $\lambda w'. [[\gamma]]^{w'}$, then $[[a]]^w = [[\beta]]^w (\lambda w'. [[\gamma]]^{w'})$

$$(70) \quad [[[_{ModP} \text{ can } [_VP \text{ Jane run}]]]]^{w,B,\leq,c} = [[\text{can}]]^{w,B,\leq,c} (\lambda w'. [[\text{Jane run}]]^{w',B,\leq,c})$$

(by IFA)

= $\lambda e. \exists w'$ compatible with circumstances in w : $\text{run}(e, J, w')$

$$(71) \quad [[(67)]]^{w,B,\leq,c} \text{ is true iff } \exists e [e \text{ in } w \wedge \tau(e) \subseteq t \{t < t^*\} \wedge \exists w' \text{ compatible with the circumstances in } w \text{ s.t. } \text{run}(e, J, w')]$$

“There is an event in the actual world located in a past interval, and there is a world compatible with the circumstances in the actual world where that event is a run by Jane.”

(Hacquard, 2009, pp.296-297)

AEs are generated as follows. The sentence is true iff there exists a past event in the evaluation world for which there exists a world that matches the circumstances of the evaluation world where that is an event of running by Jane. Given (71), the running event shares the same properties across worlds, and the event will have all of these properties in all of the worlds in which it occurs including the actual world. As a result, the running event by Jane is actualized.

To sum up, I have elucidated Hacquard’s (2006; 2009) proposal for yielding AEs with the root modal and the perfective in French. I now apply her proposal into MA root verbal modal $\backslash gdr \backslash$. My goal in applying Hacquard’s AEs machinery is to examine the cross-linguistic similarity between the French root modal and the MA root modal.

2.5 MA $\backslash gdr \backslash$ under Hacquard’s proposal

In this section, I apply Hacquard’s proposal to the MA root verbal modal $\backslash gdr \backslash$. I start with a simple sentence—without a modal—by applying Hacquard’s modified lexical entry of the perfective in MA, as shown in (72). Afterwards, I add the root verbal modal $\backslash gdr \backslash$

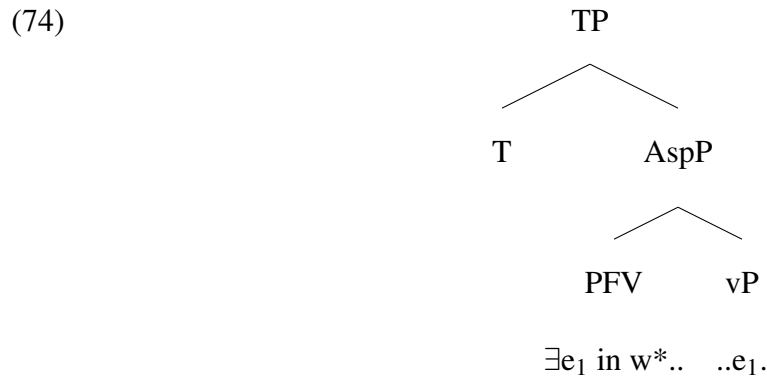
to the same sentence, where the root modal $\backslash gdr \backslash$ is located under the perfective, as in (73) and in tree (74).

2.5.1 A simple non-modal perfective sentence in MA

Consider a non-modal perfective sentence, as in (72).

- (72) Fatima ʔatzallaʒat ʒala r-rideau canal.
 Fatima skate.3.SG.F.PFV. on the-Rideau Canal
 ‘Fatima skated on the Rideau Canal.’ (MA)

- (73) $[_{TP} \text{past} [_{AspP} \text{pfv.} [_{VP} \text{Fatima skated on the Rideau Canal}]]]$



Let us formally combine these pieces for MA in toy example *Fatimah skated on the Rideau Canal*, as in (75). (For simplicity, the VP in LF is written in English.). The perfective needs to combine with a property of events P and outputs a property of times, as shown in (76), with the result, as in (77).

- (75) $[[_{VP} \text{Fatima skated on the Rideau Canal}]]^{w,c} = \lambda e. \text{ skate on the Rideau canal}$
 (e, F, w)

- (76) $[[\text{Perfective}]]^{w,c} = \lambda P_{\langle \varepsilon, t \rangle}. \lambda t_i. \exists e [e \text{ in } w \wedge \text{time}(e) \subseteq t \wedge P(e)]$

- (77) $[[\text{Perfective}]]^{w,c} ([[\text{Fatimah skated on the Rideau Canal}]])^{w,c} = \lambda t_i. \exists e [e \text{ in } w \wedge \text{time}(e) \subseteq t \wedge \text{skate on the Rideau Canal } (e, F, w)]$

In (77), this is a property that is true of a time t iff there is an event e of Fatimah skating on the Rideau Canal in the evaluation world w with a running time included in t . Adopting the referential theory of tense sketched in (Hacquard, 2006, 2009), the result of combining AspP with T is given in (78).

(78) $[[\text{Aspect Phrase}]]^{w,c} ([[\text{Past}]])^{w,c}$ is true iff $\exists e [e \text{ in } w \wedge \text{time}(e) \subseteq t \{t <^* t\} \wedge \text{skate on the Rideau canal } (e, F, w)]$

(79) $[[(72)]]^{w,c}$ is true iff $\exists e [e \text{ in } w \wedge \text{time}(e) \subseteq t \{t < t^*\} \wedge \text{skate on the Rideau Canal } (e, F, w)]$

The sentence in (79) will be true iff there is a skating event of Fatimah on the Rideau Canal in the evaluation world w , where tense locates the event e in the past.

We have seen the way the predicate of events *Fatima skated on the Rideau Canal* is combined with perfective aspect and tense phrase. In the next section, I discuss the same example but with the root verbal modal $\backslash gdr \backslash$.

2.5.2 A simple modal perfective sentence in MA

Consider the toy example in (80) with the structure given in (81).

(80) Fatima gidrat titzalla3 ʔala r-rideau canal.
Fatima ABLE.3.SG.F.PFV. 3.SG.F.skate.IMPFV. on the-Rideau Canal
'Fatima managed to skate on the Rideau Canal.' (MA)

(81) $[\text{Past } [_{\text{AspP}} \text{pfv. } [_{\text{ModP}} \text{gidrat } [\text{Fatima skated on the Rideau Canal}]]]]$

To compose the interpretation, I use Hacquard's simplified root modal lexical entry where the ordering source has no role in the interpretation of the root modal, as shown in (82).

(82) $[[\text{Gidrat}_{cir}]]^{w,B,\leq,c} = \lambda P_{<s,et>}. \lambda e_i. \exists w' \text{ compatible with circumstances in } w \text{ such that } P(w')(e)$

For the same reason I explained for (70), the modal has to combine with the predicate of events via IFA, and the result of this combination makes the types of the embedded clause and the Modal Phrase compatible, as shown in (83).

$$(83) \quad [[[_{ModP} \text{Gidrat } [_VP \text{Fatima skated on the Rideau Canal}]]]^{w,B,\leq,c} = [[\text{gidrat}]]^{w,B,\leq,c} \\ (\lambda w'. [[\text{Fatima skate on the Rideau Canal}]]^{w,B,\leq,c}) \text{ (by IFA)}$$

$$= \lambda e. \exists w' \text{ compatible with circumstances in } w: \text{ skate on the Rideau Canal } (e, F, w')$$

Adding past tense and perfective, we obtain (84).

$$(84) \quad [[(80)]]^{w,B,\leq,c} \text{ is true iff } \exists e [e \text{ in } w \wedge \tau(e) \subseteq t \{t < t^*\} \wedge \exists w' \text{ compatible with the} \\ \text{circumstances in } w: \text{ skate on the Rideau Canal } (e, F, w')]$$

The sentence in (84) will be true iff there is an event in the actual world located in a past interval, and there is a world compatible with the circumstances in the actual world where that event is a skating on the Rideau Canal by Fatima.

Finally, the default pragmatic principle ‘Preservation of event description’ (PED) would hold the same properties of the event of “skating” in the actual world as well as across worlds. In this way, AEs are generated.

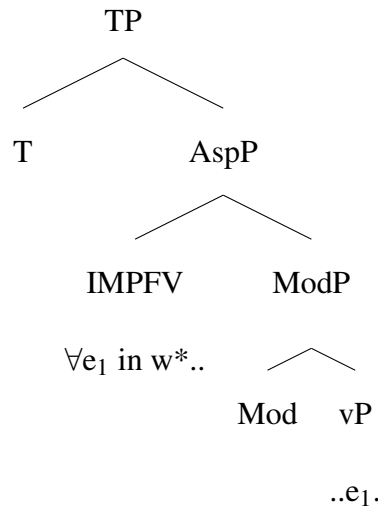
After applying Hacquard’s proposal to MA root verbal modal $\backslash gdr \backslash$, the behaviour of the MA root verbal modal $\backslash gdr \backslash$ is analogical to French root modal *a pu*. I can conclude that the proposal, which Hacquard establishes between the root modal and the perfective aspect to invoke actuality entailments, is feasible for her French data and for my MA data.

2.5.3 The case of the imperfective

Recall that AEs are missing with the imperfective, as shown in (85).

$$(85) \quad \begin{array}{lll} \text{ʔasem yi-gdar} & \text{yi-sbafi} & \text{fi l-bufiayrah.} \\ \text{Asem 3.SG.M.-ABLE.IMPFV. 3.SG.M.-swim.IMPFV. in the-lake} & & \\ \text{‘Asem is able to swim in the lake, (but he will not do it).’} & & \text{(MA)} \end{array}$$

This can be explained following Hacquard's proposal for French. In this case, the structure is as below:



Imperfective aspect binds the world argument, avoiding AEs. As for the parallel French example, Example (85) is true in w^* iff for all normal events e from the perspective of w^* at t (where certain preconditions are met), there is a world circumstantially accessible from w^* where e is a swimming event by Asem.

In this way, by quantifying over normal/expected worlds, imperfective binds the world argument of the embedded eventuality and avoids AEs. As expected, Hacquard's proposal correctly predicts that MA imperfective does not give rise to AEs.

2.6 Conclusion

In this chapter, I have examined the association of the root modal $\backslash gdr \backslash$ with the aspectual morphology in Makkan Arabic (MA). The result of this interaction causes variation in the interpretations of the root modal $\backslash gdr \backslash$. This result is analogical to other results reported on other languages with rich aspectual morphological systems such as Hindi-Urdu, Modern Greek, French and Italian. One of these readings invokes what are known as actuality entailments (AEs), where there are some inferences that the property of the event is completed in the actual world, and it cannot be cancelled. Chapter 2 make a

contribution by adding data of the root modal $\backslash gdr \backslash$ to the cross-linguistic debate.

I have also discussed the most recent approaches that consider this unique relationship between the root modal and the perfective (Bhatt, 1999, 2006; Piñón, 2003; Hacquard, 2006, 2009; Mari and Martin, 2007, 2008; Homer, 2011a; Alxatib, 2016). Among all of these approaches, I adopted Hacquard's proposal since the MA root modal $\backslash gdr \backslash$ can invoke AEs with the perfective in the same manner as in French and Italian. Finally, I have provided details about the formal computations relevant to the interaction between the MA root modal $\backslash gdr \backslash$ and the imperfective and the perfective. Under this view of the MA root modal $\backslash gdr \backslash$, the modal component is maintained in the imperfective and the perfective.

Chapter 3

The formal semantics of the modal *gaadir*

3.1 Perfect aspect and actuality entailments

In Chapter 2, I discussed Hacquard's (2014) recent claim regarding the absence of AEs with the perfect with French root modals. In Chapter 3, I examine Hacquard's claim about the French perfect with respect to my MA data with the root modal *\gdr*. In doing so, I explore the semantics of perfect aspect as described for English in some primary works by Kratzer (1998); Iatridou et al. (2001); Klein (1994); McCawley (1981); Portner (2003); Comrie (1976) in Section 3.1.2.¹ Afterwards, I discuss research on the existence of perfect aspect in some varieties of Arabic. I survey studies on the Arabic perfect by Fassi Fehri (2003) and Boneh (2010) in Section 3.1.3. Their works offer fruitful insights relative to the MA root modal *\gdr* and inferences to AEs.

In preliminary research, I assume that perfect aspect might exist in the MA aspectual system, but it might be impoverished, as reported for French Hacquard (2014). Recall that Alxatib (2016) examines the same phenomenon in Palestinian Arabic: he looks at the Palestinian nominal form *?aadir* of the nominal root modal *?aadir*. The nominal root modal *?aadir* can be preceded by the auxiliary *kaan*, and AEs are missing when the

¹Iatridou et al. (2001) provide an important discussion of the perfect from cross-linguistic perspective, considering data from English, Greek and Bulgarian.

auxiliary is present in the sentence, as shown in (1).

- (1) Ø(Kaan) ?aadir yaaxod el baas, bas axad el qiṭaar.
pro(PAST) able.NOM take the bus but took.PFV. the train
“He was able to take the bus, but he took the train.” (Alxatib, 2016, p.19)

He considers the above configuration to be challenging for Hacquard’s proposal. Unfortunately, Alxatib does not explain the absence of AEs with the nominal root modal *?aadir* with the auxiliary *kaan*. The nominal root modal *?aadir* is the PA version of the MA participle root modal *gaadir*. Alxatib treats *?aadir* as a nominal category while I consider *gaadir* as a participle category on the basis of its function in the sentence. (See Chapter 1 and Section 1.2.3 of this dissertation for more discussion on this topic.).

Before I proceed into a detailed discussion about the participle root modal *gaadir*, I will start with the intuitions behind the participle root modal *gaadir* with the auxiliary *kaan* in Section 3.1.4. The function of the auxiliary *kaan* is to anchor the participle root modal *gaadir* and its VP complement into the past. However, time specifications are not available about when the event has taken place in the past.

In a more complete discussion of the phenomenon, I note that there is another auxiliary, namely *ṣaar*, that interacts with the participle root modal *gaadir*. Together with the auxiliary *kaan*, the auxiliary *ṣaar* is a member of a group of auxiliaries in Arabic grammar. This latter auxiliary shows interesting facts about a possible shape of the MA perfect that has semantic consequences regarding AEs. In Section 3.1.4, I provide a description of the two auxiliaries as reported in the literature on Arabic grammar and present the MA core data that I have explained.

My investigation shows that this structure, which I propose to be the perfect form in MA, has not been tested in the literature on Arabic modality and MA aspects. I argue that there is a semantic role played by the auxiliary *kaan* in relation to AEs. I also propose

that analyzing the formal semantics of the MA participle root modal *gaadir*, with the auxiliary and without the auxiliary, crucially contributes to the discussion of AEs. Hence, the goal of Chapter 3 is to solve the empirical puzzle that surrounds the participle root modal *gaadir* with the auxiliary *kaan*, and to understand the absence of AEs under this configuration. I also observe that the MA participle form *gaadir* is relevant to Boneh's (2010) claim that perfect aspect exists in the Syrian Arabic (SA) aspectual system along with the imperfective and the perfective. In the case of *šaar*, AEs do arise.

In Section 3.2, I consider two formal hypotheses to account for the interaction between the MA auxiliaries with the participle root modal *gaadir*. In Section 3.2.1, I present my first hypothesis in the spirit of Portner's (2000; 2003) proposal to account for the various flavours of the English perfect. Under Portner's proposal, I offer the computation of MA examples with auxiliaries in Section 3.2.2. In Section 3.2.3, I introduce my second hypothesis on the basis of Condoravdi's (2001) proposal with respect to the multiple readings of *might have* in English. I also explain the computation of MA auxiliaries in modal and modal-free contexts in Section 3.2.4. Finally, I evaluate each hypothesis based on MA core data in Section 3.2.5, elucidating the way Portner's proposal successfully captures the MA participle root modal *gaadir* with the perfect.

Here is the proposal in a nutshell: I argue that the perfect exists in the MA aspectual system, in line with other varieties of Arabic such as Moroccan Arabic (Fassi Fehri, 2003) and Syrian Arabic (Boneh, 2010). However, I observe that the MA perfect takes various shapes, and one of those shapes involves a participle form of the verb preceded by an auxiliary—*kaan* or *šaar*. Each auxiliary invokes a distinctive flavour of the perfect in comparison to the English perfect, which has a unified shape of perfect aspect, though it expresses various flavours (Portner, 2000, 2003).

Accordingly, I pursue Portner's (2000; 2003) recent proposal, building upon it to develop an independent lexical entry for each auxiliary in the computation of the MA perfect with and without the participle root modal *gaadir*. I propose a denotation of *kaan* that predicts that AEs are always absent in conjunction with *gaadir*. Reference to AEs, on the other hand, is always present with the auxiliary *saar*. In Section 3.2.2, I offer a discussion of the formal semantics of their derivations.

3.1.1 MA core data

Before I spell out the description of the English perfect, let us review key MA data where AEs are either present or absent in the presence of the root modal $\backslash gdr \backslash$ and different aspects. Afterwards, I present the construction where the participle root modal *gaadir* appears with and without the auxiliary *kaan*. Note that examples are followed by brief scenarios to illustrate their relationships with AEs.

- (2) Fatima tigdar titzallaḡ ḡala r-rideau canal.
 Fatima 3.SG.F.ABLE.IMPFV. 3.SG.F.skate.IMPFV. on the-Rideau Canal.
 'Fatima is able to skate on the Rideau Canal.'

(Imperfective: MA)

In (2), the speaker refers to a state of affairs involving Fatimah's skating abilities at the moment of speech. The speaker is not concerned with Fatimah's skating skill prior to the speech time.

- (3) Fatima Kaan-at tigdar titzallaḡ ḡala
 Fatima kaan.3.SG.PFV.-F. 3.SG.F.ABLE.IMPFV. 3.SG.F.skate.IMPFV. on
 r-rideau canal(, laakin Kaan ḡinda-ha ḡalam fi r-rukbah).
 the-Rideau Canal, but be.PFV.3.SG.M has-she pain in the-knee
 'Fatima could have skated on the Rideau Canal, but she had a knee pain.'

(*Kaan* + Imperfective: MA)

In (3), AEs are not directly specified. As a result, the listener depends on information

provided by the context to determine the right interpretation. The speaker might make references to an actual event of skating, or a counterfactual reading *could have skated*. For the first reading, there might be a past event when Fatima could and did skate, and she had knee pain. For the second reading, the skating event might not be actualized by Fatima because of unexpected knee pain. As a result, this kind of interpretation is compatible with the counterfactual reading (has no AEs).

- (4) Fatimah gaadr-ah titzallaḡ ʕala r-rideau canal.
 Fatima ABLE.participle-3.SG.F. 3.SG.F.skate.IMPFV. on the-Rideau Canal
 ‘Fatima can skate on the Rideau Canal.’

(The participle modal *gaadir*: MA)

In (4), the nominal root modal *gaadrah* refers to Fatimah’s present abilities that have been acquired in the recent past and continues to the speech time (no AEs arise).

- (5) Fatimah kaan-at gaadr-ah titzallaḡ ʕala
 Fatima kaan.3.SG.PFV.-F. ABLE.participle-3.SG.F. 3.SG.F.skate.IMPFV. on
 r-rideau canal, laakin ma ʔatzallaḡat.
 the-Rideau Canal, but not skate.3.SG.F.PFV.
 ‘Fatima could have skated on the Rideau Canal, but she did not skate.’

(*Kaan* + the participle modal *gaadir*: MA)

When the auxiliary *kaanat* is added, the speaker makes reference to what Fatimah was supposed to do or could have done when she visited Ottawa, as shown in (5). Unfortunately, she could not skate due to her knee pain.

- (6) Fatima gidrat titzallaḡ ʕala r-rideau canal.
 Fatima ABLE.PFV.3.SG.F. 3.SG.F.ʔa-skate.IMPFV. on the-Rideau Canal
 ‘Fatima managed to skate on the Rideau Canal.’

(Perfective: MA)

In (6), there was a state of affairs where Fatimah managed to skate on the Rideau Canal upon her visit to Ottawa during the festival of Winterlude.

The above examples can be summarized in the following Table (1). The table shows, AEs are always present with perfective aspect. At this point, the structure of the participle root modal *gaadir*, in the past tense with the auxiliary *kaan* and in the present tense without the auxiliary *kaan* (with a silent auxiliary), has not yet been given a linguistic label.

	IMPFV.	PFV.	Participle
Without <i>kaan</i>	$\nrightarrow$ AE.	$\rightarrow$ AE.	$\nrightarrow$ AE.
With <i>kaan</i>	Ambiguity (as in (46))	Ungrammatical (*)	$\nrightarrow$ AE.

Table (1). Actuality Entailments (AE) relative to the MA root verbal modal $\backslash gdr \backslash$

In Table (1), I display the contexts where AEs are invoked with the root verbal modal $\backslash gdr \backslash$ in MA. Note that table (1) will be updated by the end of this discussion to include more MA data with auxiliaries.

Based on the intuitions regarding the participle root modal *gaadir* with the auxiliary *kaan*, I propose that it could constitute the MA perfect. We have seen that AEs are missing under this configuration. This evidence could support Hacquard's (2014) claim that the perfect does not trigger AEs. My hypothesis raises the following questions:

1. Does perfect aspect actually exist in MA?
2. Do actuality entailments ever arise with perfect aspect in the same manner as they do with the perfective?

To answer the questions above, the following sections present some primary works in the literature on aspect by Klein (1994); Kratzer (1998); Portner (2000, 2003); a.o. as a guideline for my investigation of the perfect aspect in MA. I also survey the work on aspect by Fassi Fehri (2003); Benmamoun (2000); Bahloul (2008); Aoun et al. (2010).

Throughout the discussion on MA, I examine Hacquard's argument that the perfect blocks AEs. If it is true that MA has perfect aspect, then the goal is to first offer a semantic proposal for a modal-free sentence in the perfect, and then add the root modal to the perfect structure. The goal of this discussion is to formally account for the immunity of the perfect from AEs. I follow a three-step process in my research. First, I look at previous discussion in the literature on the perfect in Arabic. Second, I run adverbial tests used by Boneh (2010) to tease perfect aspect apart from perfective aspect. Finally, I present my conclusions about the MA participle root modal *gaadir* and the potential of having the perfect within the MA aspectual system.

3.1.2 The English perfect

The previous discussion has been about the semantic interpretations of the imperfective and the perfective. This section explores some intriguing facts surrounding the English perfect as discussed by Bauer (1970); Comrie (1976); Iatridou et al. (2001); Klein (1994); Kratzer (1998); McCawley (1981); Portner (2000, 2003). A lexical entry of the English perfect is adopted in this section. This lexical follows Kratzer's (1998) proposal. In what follows, I begin with Kratzer's lexical entry of the perfect, and then I talk about the way linguists describe the English perfect.

As with the perfective and the imperfective, Kratzer (1998) makes a proposal for Klein's (1994) description of the perfect, as shown in (7).

- (7) $[[\text{Perfect}]] = \lambda P_{\langle \ell, \langle s, t \rangle \rangle}. \lambda t_i. \lambda w_s. \exists e_{\ell} (\text{time}(e) < t \text{ and } P(e)(w) = 1)$ 'event over by reference time' (Kratzer, 1998, p.107)

Note that in Kratzer's lexical entry of the perfect, it only has one interpretation, where the event is completed, as shown in (7). The reference time falls after the time of the

completed event.²

Perfect aspect can conjoin with present or past tense. When present tense is combined with perfect aspect, the temporal boundary of the completed event is close to or before the speech time. If past tense is associated with perfect aspect, then there is reference to a past event without giving any time specifications. The event is always completed in both the present perfect and the past perfect.

Building on earlier work by Comrie (1976), as well as Klein (1994), Portner (2000, 2003) extensively describes the various readings of the English perfect, adding a semantic theory for the multiple readings of the English perfect. For Portner, the various readings of the perfect are due to pragmatic effects. A temporal semantic relation combines with a non-temporal pragmatic relation. I will provide an informal overview here, and a more formal presentation in Section 3.2.1.

The temporal relation is expressed by perfect aspect as a result of the truth-conditional semantic contributions. The non-temporal relation is represented pragmatically where information relevance feeds interpretation. For the pragmatic contribution, Portner integrates an epistemic modal proposal to account for the multiple readings for perfect aspect. The reader may refer to Portner (2000, 2003) for further details. The following examples represent the multiple flavours that are reported in the literature on the perfect (Klein, 1994; Portner, 2000, 2003). As can be seen in examples (8) to (11), there are various temporal relations between the denoted event (e) and the speech time (s*). Examples for the ‘resultative perfect’ will be similar to (8).

(8) Mary has read *Middlemarch*. (Portner, 2003, p.459)

In (8), there is a reference to a past state or a past event that has a current result. The

²We will see in the next discussion a different semantic treatment of the perfect aspect by Portner (2000, 2003) to account for the multiple flavours of the English perfect.

speaker asserts that there is an eventuality of *having read Middlemarch* before the speech time (s^*). It has probably happened a few years before (s^*). *Middlemarch* is not an easy text to read. Portner points out that Mary must have decided to develop her reading skill to comprehend difficult literary texts. She finally succeeds in reading *Middlemarch* and understands George Eliot's style. This shift from having regular reading skills into more advanced ones represents a 'resultative relationship'. The first eventuality corresponds to her efforts to read literary texts while the second state asserts finishing *Middlemarch* and understanding it, a 'result state' (s). Note that the result state (s) holds at the speech time (s^*). This resultative relationship that is encoded by perfect aspect gives rise to a 'resultative perfect'. This resultative perfect is a flavour that I aim to account for in the MA perfect in this Chapter.

Let us see the 'existential perfect' in (9).

- (9) The earth has been hit by giant asteroids before (and probably will be again).

(Portner, 2003, p.459)

Example (9), on the other hand, refers to a fact that happened in the past (a few millions years ago) when giant asteroids hit the Earth. We are currently in the state of having been hit by giant asteroids. It has happened. This type of perfect is called 'an existential perfect', which does not aim to locate a result state, but indicate that an event has happened. The existential perfect is the second type of perfect that I also aim to account for in MA in this chapter.

Let us look at other flavours of the perfect, such as the 'continuative perfect', as shown in (10).

- (10) Mary has lived in London for five years. (Portner, 2003, p.459)

In (10), the state of affairs of “living in London” happens before the speech time (s^*) or sometimes overlaps with (s^*). It is possible that Mary lived in London for five years before the speech time (s^*), and then she had moved from London to Paris before (s^*). It is also possible that Mary moved to London five years ago, and the event of living in London stretches up to the speech time (s^*). Hence, the described (e), which may precedes (s^*) or overlaps (s^*) is what causes the perfect to be characterized as a ‘continuative perfect’ (also referred to as a ‘universal perfect’). This type of perfect lacks the result state (s), which is available in example (8).

The English perfect can also express “Hot News”, as illustrated in (11).

(11) The Orioles have won! (Portner, 2003, p.460)

In (11), imagine a scenario where the Orioles have won a baseball game. The speaker reports this victory (‘Hot News’) by saying the statement in (11). The event of winning happens a few moments before the speech time (s^*) (the winning event has just happened). Note that Example (11) resembles Example (8) where the described events (e) happen in the past and have current results at the speech time (s^*).

To conclude, I have discussed the English perfect as described by Comrie (1976); Klein (1994); a.o. and formalized by Portner (2000, 2003). I have also presented Kratzer’s (1998) well-known proposal for the English perfect. This descriptive section about the English perfect offers insights regarding my investigation of the the Arabic perfect, which the following discussion will explore.

3.1.3 The Arabic perfect

In this section, I analyze the participle form that is derived from verbs in MA (see Chapter 1 and Section 1.2.3 for the description of the MA participles). Later, I argue that this

participle form represents the MA perfect aspect. I also observe that the participle can be preceded by auxiliaries *kaan* and *ṣaar*. This structure invokes a reading parallel to the English past perfect. I display the interpretations associated with each auxiliary in a modal-free sentence. I observe that the auxiliary *kaan* always encodes an ‘existential perfect’ while the auxiliary *ṣaar* expresses a ‘resultative perfect’. I conclude that the MA perfect is lexically encoded, unlike the English perfect. As I have discussed in Section 3.1.2, the English perfect takes one unified shape, but it expresses a wide range of flavours depending on the contextual information to determine the intended reading.

In the same section, I turn the discussion into the participle root modal *gaadir*. Afterwards, I combine the participle root modal *gaadir* with auxiliaries *kaan* and *ṣaar*. The result of this combination reveals intriguing facts relative to AEs, which I consider a novel observation regarding the Arabic aspect and modals. With the auxiliary *kaan* + *gaadir*, AEs are always absent in this structure. With the auxiliary *ṣaar* + *gaadir*, on the other hand, AEs are always generated.

The following discussion is structured as follows. I begin the discussion with two works on the Arabic perfect by Fassi Fehri (2003) and later by Boneh (2010). Regarding MA, I build on Boneh’s work for my analysis of the MA perfect. Finally, I offer some MA data, which best represents the MA perfect.

To argue for the existence of the perfect in the MA aspectual system, I explore Arabic aspect as characterized by the Arab linguists, such as Fassi Fehri (1993, 2012); Benmamoun (2000); Bahloul (2008); Aoun et al. (2010); a.o. My investigation reveals that two studies propose the existence of the Arabic perfect: by Fassi Fehri (2003) for Moroccan Arabic, and by Boneh (2010) for Syrian Arabic. Each one of them looks at a specific structure, and later claims that this structure represents the Arabic perfect. For instance,

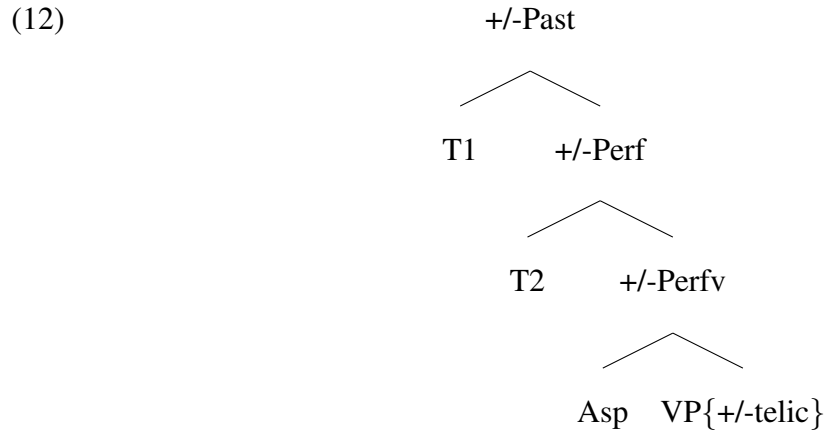
Fassi Fehri (2003) investigates the presence of an auxiliary *kaan* with the imperfective VP complement in Moroccan Arabic. Boneh (2010), on the other hand, analyzes the participle form of the verb and tests the presence of the auxiliaries *kaan* and *ṣaar* before the participle form in Syrian Arabic.

I have started my research on Arabic aspects in Chapter 1 with well-known works by Arab linguists such as (Benmamoun, 2000; Aoun et al., 2010). They view Arabic as being fundamentally a bi-aspectual system, where Arabic aspect is classified as perfective or imperfective (based on examples from Standard Arabic and some Arabic varieties such as Moroccan and Lebanese). Given Hacquard's (2014) claim about the perfect, it is worth to examine the presence of the perfect within the MA aspectual system. My investigation on the MA perfect aims to expand the MA bi-aspectual system described in the works of Benmamoun (2000) and Aoun et al. (2010). The outcome of my research shows interesting AEs results relative to the MA participle modal *gaadir*. My proposal will be built on recent proposals described above that are dedicated to the existence of a perfect aspect in the Arabic temporal system.

Fassi Fehri (2003) reviews the Arabic aspectual system and expands it to include the perfect aspect. He points out some properties of the perfect aspect and some areas where it diverges from the perfective aspect. His work on the Arabic perfect can be summarized as follows.

First, Fassi Fehri claims that Arabic expresses the simple past tense and the perfect with the same type of morphology, as presented in (12) and in (13). According to Fassi Fehri, there is a structural height difference between the perfect and the perfective. The perfect is merged higher in the computation, and it is closer to a tense phrase (TP), as shown in tree (12). In Arabic, T1 and T2 are expressed with the same type of morphology.

According to, Fassi Fehri, T1 refers to past, present or future, while T2 is defined as perfect or imperfect.



(Fassi Fehri, 2003, p.76)

- (13) *sakan-a barliin-a.*
 lived-3 Berlin-acc.
 ‘He lived in Berlin’ or ‘He has lived in Berlin.’ (Fassi Fehri, 2003, p.76)

In (13), the speaker may refer to a past state of an event, as in, “He lived in Berlin”. Another reading would be the present perfect reading, “He has lived in Berlin”. To resolve this simple past and perfect aspect ambiguity, pragmatic information is required to capture the intended reading.

However, there is one explicit way to resolve the above ambiguity, as shown in (14), which is the use of the adverbial *munḏu* ‘since’. By the use of the adverbial *munḏu*, more details are added to express that the past state overlaps with the speech time; for instance:

- (14) *sakan-a barliin-a munḏu 1990*
 lived-3 Berlin-acc. since 1990
 ‘He has lived in Berlin since 1990.’ (Fassi Fehri, 2003, p.77)

Second, Fassi Fehri also argues that perfect aspect does not have a transparent shape as in English. Rather, the Arabic perfect comes in different shapes. One of its shapes is analogical to the simple past, as shown in (15). In addition, a combination of the auxiliary

kaan and the imperfective form of a verb yields perfect aspect as well, as illustrated in (16). The third shape, the nominal (participle), will be discussed in details in relation to Boneh's (2010) work.

(16) Kaan-a katab-a r-risalat-a.
was-3 wrote-3 the-letter-acc.
'He had written the letter.'
(Fassi Fehri, 2003, p.71)

In (16), the auxiliary *kaan* indicates that the past event of writing *kataba* occurs before the speech time, and this is what is known as ‘past perfect’ (Fassi Fehri, 2003).

(17) fatafi-tu l-baab-a munθu saaʕatayni.
opened-I the-door-acc. since two.hours
'I have opened the door since two hours.'³ (Fassi Fehri, 2003, p.90)

To sum up Fassi Fehri's (2003) work, three things can be concluded relative to the MA aspectual system. First, perfect aspect can be added to the Arabic aspectual system, which predicts that the perfect aspect might also be present in other varieties of Arabic. Second, he confirms the claim in the literature on perfect aspect (Portner, 2003) that the perfect

does not specify a ‘temporal reference’ for events. This property of the perfect aspect separates it from the perfective, which requires determination of the time of the event. Third, Fassi Fehri opens doors for the investigation of perfect aspect in other varieties of Arabic, such as the next study by Boneh (2010).

One shortcoming of Fassi Fehri’s work is that he focuses on the perfect form of the verb, but he does not investigate the participle form—the form under investigation in this dissertation: *gaadir*. Boneh (2010), on the contrary, looks at the participle form of some verbs in Arabic. She also examines the precedence of the auxiliary *šaar* with the Syrian Arabic participles, which I consider “the” first attempt that looks at *šaar* in Arabic syntax. The following discussion will highlight Boneh’s analysis of the nominal forms of verbal phrases as perfect aspect in Syrian Arabic.

Boneh (2010) argues that the participle expresses perfect aspect in Syrian Arabic. (Note that Boneh’s analysis does not involve any association between root modals and aspect that has relevance to AEs.) In the following discussion, I review Boneh (2010), and I combine Boneh’s view on perfect aspect in SA with Alxatib’s view on the immunity of the PA participle from AEs. This will pave the way for Hacquard’s claim that perfect aspect does not yield AEs.

Boneh examines two categories of verbs in SA: dynamic verbs—accomplishment and achievement verbs—and stative verbs. The participle form of the dynamic verbs gives rise to the resultative perfect reading, as shown in (18) and (19). The participle form of the stative verbs yields an ‘inchoative reading’, as shown in (20) and (21). Note that the assertion time for the participle—for both dynamic and stative verbs—is included in the post event state rather than the eventuality-time.

- (18) Sami kaateb ʔr-risaale.
 Sami write-PART.SG.M. the-letter
 ‘Sami has written the letter.’ (Boneh, 2010, p.3)

- (19) Sami laabes tyaab-o.
 Sami wear.PART.3.SG clothes-3.SG.
 ‘Sami has put on his clothes (and still has them on at speech time).’
 (Boneh, 2010, p.5)

In (18) and (19), it is true that Sami’s state holds at the time of utterance. The post event state yields the results of the eventualities, which are Sami having written the letter, and Sami having his clothes on.

- (20) Sami mʔamen be-lmaxluuʔaat lfaDaaʔiye.
 Sami believe.PART.SG.M. in-the-creatures the-out-of-space
 ‘Sami has come to believe in aliens (he is now in a state of believing in aliens).’
 (Boneh, 2010, p.4)

- (21) Sami naayem.
 Sami sleep-PART.SG.M
 ‘Sami has fallen asleep (and now he is asleep).’ (Boneh, 2010, p.4)

Examples (20) and (21) show assertions where Sami has changed his state from not believing in aliens into a state of believing of their existence. Also, Sami was awake a few minutes or hours ago, and he is now asleep. This shift from one state to another, or entering a new state of affairs, represents the inchoative reading in SA.

MA seems to pattern with SA regarding perfect aspect. When the dynamic and stative verbs are translated into MA, the same results are obtained as in SA. Let us examine the participle with dynamic verbs and stative verbs in MA in the same manner as the SA examples from (18) and (21).

- (22) Sami kaatib r-risaalah.
Sami write.PART.3.SG. the-letter
'Sami has written the letter.' (MA)
- (23) Sami laabes malaabs-o.
Sami wear.PART.3.SG clothes-3.SG.
'Sami has put on his clothes (and still has them on at speech time).' (MA)
- (24) Sami naayem.
Sami sleep-PART.3.SG.
'Sami has fallen asleep (and now he is asleep).' (MA)

More MA examples are given below to illustrate the intuitions behind the participles. For the resultative reading, imagine a scenario where a teacher has assigned some of Ahmed Shawqi's poems to be memorized by her students.⁴ When she checks with her students to see who has already memorized those poems, Sami raises his hands and says the following statement.

- (25) ?ana fiaafid l-?abyaat.
I.M. memorize.PART.SG.M the-poems
'I have memorized the poems.' (MA)

For the inchoative reading, suppose there is a scenario where Fatima lives close to the University of Ottawa campus. She is interested to see who else lives in the same area, so she asks a question: Who lives close to the University of Ottawa campus? And Sami answers:

- (26) ?anaa faayf gareeb min l-zaamfaah.
I live.PART.3.SG.M. close to the-university
'I have lived/ live close to the University of Ottawa campus.' (MA)

The above example shows Sami's current state of being close to the University of Ottawa campus. The state of living close to campus is simultaneous to the speech time. This type

⁴Ahmed Shawqi is a famous Arab poet. He is known as the "prince of poets" in the Middle East.

of perfect reading is analogous to Portner's (2000; 2003) continuous perfect reading.

To conclude, I have discussed two studies that provide evidence that the perfect exists in the Arabic aspectual system (Fassi Fehri, 2003; Boneh, 2010). Contrary to the English perfect, which has one perfect form, MA offers a richer morphological system to express the perfect. MA is claimed to have multiple shapes of the perfect in its aspectual inventory.

I will now examine the case of the MA participle root modal *gaadir*. In what follows, I describe the semantic difference between what is assumed to be perfect aspect—the participle form *gaadir*—and the perfective aspect *gidir*. I adopt Boneh’s (2010) adverbial tests to tease apart the perfective from the perfect in Syrian Arabic. These adverbial tests support my argument about the existence of the perfect in the MA aspectual system. Later, I will show its relevance to Hacquard’s (2014) response to potential counterexamples.

In principle, the adverbial tests measure the duration of an eventuality, such as “in X times”, following Boneh’s examples in (27) and (28). The adverbial test with “in X minutes” shows that it is not possible to have this kind of adverbial with the perfect *gaadir*, as shown in (29) and (30).

- [illegible]

- (30) Sami gidir yi-lifad l-ʔabyaat fi/xilal ʕafara
 Sami ABLE.3.SG.M.PFV. 3.SG.M.-memorize.IMPF. the-poems in ten
 dagaayg.
 minutes
 ‘Sami managed to memorize the poems in ten minutes.’ (MA: Perfective)

Examples (29) and (30) present the difference between the perfective aspect and the perfect. The perfective form of the root verbal modal *gidir* and its complement “memorize” indicate that the speaker managed to finish memorizing the poems. The final stage is a complete memorization of the poems. As a result, the time of the eventuality can be measured by the adverb “in X times”, as in (30). In (29), on the other hand, the eventuality time and its subparts cannot be measured. In the perfect, the time of the event is not available for modification.

Another adverbial test involves the adverbial “at X time”, as shown for Syrian Arabic in (31) and (32). Stative and non-stative verbs react differently with the positional adverb “at X time”. The stative verb “sleeping” is the post-state of “fallen asleep” in (31). The positional adverb locates the post-state “sleeping” in the time interval. In (32), on the other hand, it is impossible to locate the non-stative verb “writing” in the time interval by the use of “at X time”. Therefore, the positional adverb “at X time” is not acceptable with non-stative (dynamic) verbs, as shown in (32).

- (31) Sami naayem ʔs-saaʕaa ʔarbʕa.
 Sami sleep.PART.SG.M. the-hour four
 ‘Sami fell asleep at four o’clock.’ (Boneh, 2010, p.12)

- (32) #Sami kaateb ʔr-risaale ʔs-saaʕaa ʔarbʕa.
 Sami write.PART.SG.M. the-letter the-hour four.
 ‘#Sami has written the letter at four o’clock.’ (Boneh, 2010, p.16)

I turn now to the MA participle *gaadir*, I use the “at X time” test to provide another piece of evidence for the existence of the perfect aspect in MA, as demonstrated in (33)

(33) ʔana gaadir ʔanaam as-saaʕah xamsa.
I.M ABLE.Participle.1.SG.M. sleep.1.SG.M.IMPFV. at.the-clock five
'I have managed to sleep at five o'clock.' (MA: Perfect)

(34) #ʔana gaadir ʔfiḥad l-ʔabyaat
I.M. ABLE.Participle.1.SG.M. memorize.1.SG.M.IMPFV. the-poems
as-saaʕah xamsa.
at.the-clock five
'I have managed to memorize the poems at five o'clock.' (MA: Perfect)

(35) ʔana gidirt ʔnaam as-saaʕah xamsah.
I.M. ABLE.1.SG.M.PFV. sleep.1.SG.M.IMPFV. at.the-clock five
'I managed to sleep at five o'clock.'

(MA: Perfect)

(36) ʔana gidirt ʔafid l-ʔabyaat as-saaʕah
I.M. ABLE..SG.PFV. memorize.1.SG.M.IMPF. the-poems at.the-clock
xamsah.
five
'I managed to memorize poems at five o'clock.'

(MA: Perfective)

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- (37) #Sami kaateb ?r-risaale xams marrat mən tlet tyaam.
 Sami write.PART.SG.M. the-letter five times since three days
 Intended: ‘Sami has written the letter five times in the last three days.’

(Boneh, 2010, p.17)

Boneh also suggests adding the auxiliary *ṣaar* “to become” before the participle forms, as shown in the non-modal example (38).⁵ The addition of the auxiliary *ṣaar* would allow each adverbial to modify each eventuality: “to become”, as illustrated in (38).

- (38) Sami ṣaar kaateb ?r-risaale xams marrat mən tlet tyaam.
 Sami become write.PART.3.SG.M. the-letter five times since three days
 ‘Sami has written the letter five times in the last three days.’

(Boneh, 2010, p.17)

I also predict that the reason for adding the auxiliaries *ṣaar*, as in (38), and *kaan*, as in (39), is to distribute the modification by the adverbials between the auxiliary and the nominal *gaadir*. So, the adverb “X days ago” would modify the auxiliary *kaan*, since the past auxiliary makes references to a past event, while the adverb “X times” modifies the number of times of managing to do a particular event.

- (39) ?ana kunt gaadir ?aradid
 I.M. kaan.1.M.PRFV. ABLE.Participle.1.SG.M. repeat.1.SG.M.IMPFV.
 I-?abyaat xams marraat min talat ?ayam.
 the-poems five times.PL.F. from three days
 ‘I could have repeated the poems five times three days ago, but I didn’t.’

(MA: Perfect)

Observe that this type of auxiliary *kaan* when combined with the participle root modal *gaadir* leads to the counterfactual reading, as will be formally considered in Section 3.2. Therefore, AEs do not hold when *kaan* and the participle *gaadir* are combined together. The auxiliary *kaan* has a unique grammatical status when it precedes the participle form

⁵The auxiliary *ṣaar* belongs to a group of Arabic auxiliaries in which each expresses a specific reading. I offer an analysis of the auxiliaries *kaan* and *ṣaar* in Section 3.2. I also show their relationships to Actuality Entailments (AEs) in the context of the participle root modal *gaadir*.

(40) ʔana ʃirt gaadir ʔaradid l-ʔabyaat
I.M. ʃaar.1.M. ABLE.Participle.1.SG.M. repeat.1.SG.M.IMPFV. the-poems
xams marraat min talat ʔayam.
five times.PL.F. from three days
‘I had managed to repeat the poems five times three days ago, (#but I didn’t).’

(MA: Perfect)

Based on Examples (39) and (40), I observe that the auxiliaries *kaan* and *şaar* have an important contribution in the interpretation of the participle root modal *gaadir*. This is a novel observation that has not been formally investigated in the literature on modality and aspect. Both auxiliaries have various implications regarding AEs. My observation about the MA perfect with auxiliaries can be associated with Hacquard's (2014) claim that the perfect does not generate AEs, in response to some of the counterexamples raised by Mari and Martin (2008) and Homer (2011a) (as discussed in Chapter 2). Since I argue that the participle root modal *gaadir* in the presence of auxiliaries constitutes the MA perfect, it is crucial to understand the intuitions behind each auxiliary at this level of my research. Once the intuitions for each auxiliary are known, their connection with AEs will become apparent. In what follows, I consider the intuitions for each auxiliary, *kaan* and *şaar*, and relate them to Portner's perfect examples.

This section illustrates the grammatical functions of the auxiliaries *kaan* and *ṣaar*. I provide a description of the auxiliaries that draws on various sources in the Classical Arabic

grammar literature (Ahmad, 1977; Al-Kuwari, 2011; Al-Kuwarie, 2009; Hassanein, 2006; Wright and Caspari, 1964; Ryding, 2005) and Arabic syntax (Alharbi, 2017; Bahloul, 2008; Benmamoun, 1999, 2000; Fassi Fehri, 1993). This general overview introduces the common characterizations between the two auxiliaries. Afterwards, I spell out the intuitions of each auxiliary in a modal-free sentence. Finally, I introduce the intuitions where the two auxiliaries occur with the MA participle root modal *gaadir*.

I will begin the discussion with an overview about the behaviour of the auxiliary *kaan* as described by Arab grammarians and Arab linguists. This description is also applicable to the auxiliary *ṣaar*, since they are both members of the set of Arabic auxiliaries.⁶ My research reveals that Arab linguists have not explored the auxiliary *ṣaar* in comparison to *kaan* except in the work of Boneh (2010).

I observe three important properties of the auxiliaries *kaan* and *ṣaar* in MA building on ideas already present in Arabic Classical Grammar. First, there is a consensus among Arab grammarians that *kaan* is best described as an auxiliary, which combines with a noun and a complement. The complement of the auxiliary *kaan* can be a noun, as in (41), an adjective, as in (42), an imperfective VP complement (as claimed by Benmamoun (1999) for the distribution of the Arabic imperfective), as in (43) or a participle, as in (44).

- (41) Muhammad *kaan* muṣallim.
 Muhammad *kaan*.3.SG.M.PFV. teacher.M.
 ‘Muhammad was a teacher.’ (MA)

- (42) Muhammad *kaan* mareeD.
 Muhammad *kaan*.3.SG.M.PFV. sick.M.
 ‘Muhammad was sick.’ (MA)

⁶The auxiliary *kaan* belongs to a group of auxiliaries called “sisters” in Arabic Classical Grammar (Ahmad, 1977; Al-Kuwari, 2011; Al-Kuwarie, 2009; Hassanein, 2006; Wright and Caspari, 1964; Ryding, 2005), which includes *ṣaar*, *ʔaṣbafi*, *ʔamsaa*, *baat* and *ḍalla*. Each of these auxiliaries carry a distinctive reading. In this dissertation, I focus on two auxiliaries, *kaan* and *ṣaar*, since they are commonly used by MA speakers.

- (43) Muhammad kaan ya-drus.
 Muhammad kaan.3.SG.M.PFV. 3.SG.M-study.IMPFV.
 ‘Muhammad was studying.’ (MA)

- (44) Muhammad kaan daaris fi-zaamiyat Ottawa.
 Muhammad kaan.3.SG.M.PFV. study.3.SG.M.Participle at-university Ottawa
 ‘Muhammad had studied at University of Ottawa.’ (MA)

Second, like the MA verbs, the auxiliaries have to agree with the specifier DP in all features: gender, number and person. For instance;

- (45) Muhammad kaan muʿallim.
 Muhammad kaan.3.SG.M.PFV. teacher.M.
 ‘Muhammad was a teacher.’ (MA)

- (46) Fatimah kaan-at muʿallim-ah.
 Fatimah.F. kaan-3.SG.F.PFV. teacher-3.SG.F.
 ‘Fatimah was a teacher.’ (MA)

- (47) Muhammad ʃaar muʿallim.
 Muhammad ʃaar.3.SG.M.PFV. teacher.M
 ‘Muhammad became a teacher.’ (MA)

- (48) Fatimah ʃaar-at muʿallim-ah.
 Fatimah.F. ʃaar-3.SG.F.PFV. teacher-3.SG.F.
 ‘Fatimah became a teacher.’ (MA)

Third, the auxiliary *kaan* is only available with the perfective, as in (49), but it is not overt with the imperfective, as shown in (50).⁷

- (49) Muhammad kaan muhandis.
 Muhammad kaan.3.SG.M.PFV. engineer.M.
 ‘Muhammad was an engineer.’ (MA: Perfective Aspect)

- (50) Muhammad muhandis.
 Muhammad engineer.M.
 ‘Muhammad is an engineer.’ (MA: Imperfective Aspect)

⁷I will not discuss the absence of the auxiliary *kaan* in this dissertation.

The auxiliary *ṣaar*, on the other hand, has to appear with the perfective and the imperfective, as illustrated below.

- (51) Muhammad ṣaar muhandis.
 Muhammad ṣaar.3.SG.M.PFV. engineer.M.
 ‘Muhammad became an engineer.’ (MA: Perfective Aspect)

- (52) Muhammad yi-ṣeer muhandis.
 Muhammad 3.SG.M.ṣeer.IMPFV. engineer.M.
 ‘Muhammad becomes an engineer.’ (MA: Imperfective Aspect)

Let us turn the discussion now into the intuitions of each *kaan*, and then *ṣaar*. I first survey the intuitions behind each auxiliary in modal-free contexts. The motivation for examining modal-free contexts is to establish the semantics of these auxiliaries independently of the participle root modal *gaadir*. In what follows, I begin with the auxiliary *kaan*, and then describe the auxiliary *ṣaar* in modal-free sentences.

The auxiliary *kaan* always has references to the past time where the event is completed. The auxiliary *kaan* does not have any references that hold in the speech time as you can see in the following examples.

- (53) Muhammad kaan muʿallim.
 Muhammad kaan.3.SG.M.PFV. teacher.M.
 ‘Muhammad was a teacher.’ (MA)

In (53), Muhammad was a teacher ten years ago (he could be a businessman now). In (54) below, there exists an event of Muhammad being a student at the University of Ottawa. The event of studying happens many years ago before the speech time.

- (54) Muhammad kaan daaris fi-zaamiʿat Ottawa.
 Muhammad kaan.3.SG.M.PFV. study.3.SG.M.Participle at-university Ottawa
 ‘Muhammad had studied at University of Ottawa.’ (MA)

In (54), Muhammad has a degree that proves he studied at University of Ottawa at some time in the past. Note that this structure where the auxiliary *kaan* precedes the MA par-

ticiples is what I aim to account for in this chapter. The example below has the auxiliary *kaan* with the MA participle *xaabizah* “had baked”.

- (55) Fatimah kaanat xaabz-ah pizza.
 Fatimah kaan.3.SG.PFV. bake.3.SG.F.Participle pizza
 ‘Fatimah had baked pizza.’ (MA)

In (55), the speaker is referring to a fact when Fatimah baked pizza a few days ago. This reading is analogous to the English existential perfect. This is illustrated below with Portner’s prototypical existential example:

- (56) ʔaʒraam ʕimlaakah kaanat muxtariq-ah
 asteroids giant.F. kaan.3.SG.F.PFV. break.through.3.SG.F.Participle.
 l-yilaaf l-ʒawie.
 the-atmosphere the-space
 ‘Giant asteroids had hit the atmosphere of Earth.’ (MA)

Building on Portner’s discussion about the English perfect in Section 3.1.2, the auxiliary *kaan* with the MA participle *muxtariq-ah* “had hit” resembles the existential perfect. In (56), there is a fact that giant asteroids hit the Earth millions of years ago.

I suggest that the auxiliary *kaan* with the participle share the same intuitions of the English existential perfect. I also argue that the structure—*kaan* with the MA participle—is one shape of the MA perfect.

Now, I turn the discussion to explore the intuitions of the auxiliary *ṣaar* in MA. As stated earlier, the auxiliary *ṣaar* is a member of a group of auxiliaries known as “sisters”, in the terms of Classical Arab Grammarians. The auxiliary *ṣaar* represents a distinctive reading from *kaan*, as we will see in the Examples (57) and (58).

- (57) ṣaar-at thaqaafatu-haa ʔaalaamiyyatan.
 became-3.SG.F.PFV. culture.F.-its global.F.Adj.
 ‘She had become globally cultured.’ (Ryding, 2005, p.638)

The intuition behind Example (57) is as follows. Suppose that Muna—for example—

- (60) Fatimah *ṣaarat* *qaariʔah* *Middlemarch*
 Fatimah *ṣaar.3.SG.F.PFV. read.Participle.3.SG.F. Middlemarch*
 ‘Fatimah had read *Middlemarch*.’ (MA)

In (60), the speaker describes a state of affairs where Mary’s reading skills are becoming so advanced that she reads *Middlemarch*, and she understands George Eliot’s style. This final state represents the result state which holds at the speech time.

Building on the intuitions of the auxiliary *ṣaar*, I argue that the auxiliary *ṣaar* has a ‘resultative reading’. This resultative reading is analogous to the English resultative perfect, which I illustrated in Section 3.1.2. However, what is interesting about the MA perfect is encoding the resultative perfect by the use of the auxiliary *ṣaar*, unlike the English perfect. This structure—*ṣaar* with the MA participle—is the second shape of the MA perfect, that invokes the resultative perfect reading.

In sum, given the intuitions of the MA auxiliaries, I claim that MA has perfect aspect in its aspectual system. I also claim that the MA perfect has various shapes. Each shape is anchored with an auxiliary to express an independent flavour of the perfect. This fact about the MA perfect is similar to Portner’s analysis of the English perfect, as I discussed earlier in Section 3.1.2. The English perfect, however, has one unified shape, and it expresses multiple flavours. These flavours are identified on the basis of pragmatics and contextual input.

Now, I begin the discussion where I add the MA participle root modal *gaadir* to the MA perfect with auxiliaries. I obtain intriguing results that have novel contributions to the association between the MA participle root modal and the MA perfect.

Taking the perfect with auxiliary *kaan* and the participle modal *gaadir*, we obtain a different interpretation from the above readings. The event did not happen in the past since the circumstances were not available to actualize the event. I call this type of reading

the counterfactual reading, as presented in (61).

- (61) ʔaʒraam ʕimlaakah kaanat *gaadrah*
 asteroids giant.F. kaan.3.SG.F.PFV. gaadir.Participle.3.SG.F.
 taxtariq l-ʕilaaf l-ʒawie.
 3.SG.F.break.through.IMPFV. the-atmosphere the-space
 ‘Giant asteroids could have hit the atmosphere of Earth.’

(MA: Counterfactual Reading)

Let us see another example of the auxiliary *kaan* with the participle root modal *gaadir*, as in (62).

- (62) ʔasem kaan gaadir yirfaʕ
 Asem kaan.3.SG.M.PFV. ABLE.3.SG.M.Participle 3.SG.M.lift.IMPFV.
 ʔa-θθalaʒah_i, bus ma rafʕ-ha_i.
 ʔ.the-fridge.F., but not lift.3.SG.M.PFV-3.SG.F.
 ‘Asem could have lifted the fridge, but he did not do it.’

(MA: Counterfactual Reading)

Imagine (62) in a scenario in which Asem renovates his kitchen last month, and the fridge needs to be raised/moved. Asem is going to lift the fridge, but he remembers his back pain. In the end, he decides not lift the fridge to avoid the risk of having back pain. In (62), the event of “lifting the fridge” is not actualized in the past time.

Given the above examples with the perfect with auxiliary *kaan* and the participle *gaadir*, I conclude that AEs are always absent. This configuration is in line with Hacquard’s (2014) claim that inflecting the French root modal with the perfect morphology will block AEs.

Back to the perfect with the auxiliary *ʕaar*, I observed that the structure where the auxiliary *ʕaar* precedes the MA participle modal *gaadir*, AEs are always generated, as shown on (63).

- (63) ʕasem ʕaar gaadir yirfaʕ
 Asem ʕaar.PFV.3.SG.M. ABLE.PART.3.SG.M. 3.SG.M.lift.IMPFV.
 ʔa-θθalaaʒah_i, #bus ma rafʕ-ha_i.
 ʔ.the-fridge,# but not lift.PFV-it.F.
 ‘Asem had managed to lift the fridge, # but he did not do it.’ (MA)

In (63), there is a state of affairs where Asem physically became capable of lifting the fridge after he put on some muscles and gained strength. It is impossible to cancel or deny the truth conditions of the proposition following the auxiliary *ʕaar*, unlike the auxiliary *kaan*. The intuition reveals an assertion of a shift from one state, of not being able to lift the fridge, into another state when Asem became capable of lifting it and did it.

Let us see another example where the speaker talks about Fatimah’s current reading abilities, as in (64).

- (64) Fatima ʕarat gaadrah tiqraʔ
 Fatimah ʕaar.3.SG.F.PFV. gaadrah.Participle.3.SG.F. 3.SG.F.read.IMPFV.
 Middlemarch.
 Middlemarch
 ‘Fatimah had managed to read *Middlemarch*.’ (MA)

In (64), Fatimah is capable of understanding and describing Goerge Eliot’s style on the basis of her current advanced reading abilities. The intuitions of the perfect with *ʕaar* + *gaadir* match the resultative perfect reported for the English resultative perfect. (See Section 3.1.2. for further details on the English perfect.).

Given the above descriptive discussion where the MA participle *gaadir* is added to the MA perfect with auxiliaries, I observe that the combination of the perfect with *ʕaar* and the participle root modal *gaadir* yields interesting facts regarding AEs. When the auxiliary *ʕaar* precedes the MA participle modal *gaadir*, AEs are always available and they cannot be cancelled. I also observe that the combination of the perfect with *kaan* and the participle modal *gaadir* does not generate AEs.

To conclude this section, I argue that the perfect is present in the MA aspectual system.

The MA perfect may have multiple forms, and the participle is one of shapes of the perfect. This conclusion is in line with Fassi Fehri's (2003) and Boneh's (2010) claims of the existence of perfect aspect in the Arabic aspectual system; each one of them investigates a specific syntactic form, as demonstrated earlier in Section 3.1.3.

I also establish Table (3) that provides an update to the previous Table (2). As you can see in Table (3), I illustrate the relationship between the different shapes of the root verbal modal $\backslash gdr \backslash$ in association with aspectual morphology in MA.

Auxiliary	$\backslash gdr \backslash$.IMPFV.	<i>gdir</i> .PFV.	<i>gaadir</i> .Participle.
Without <i>kaan/ṣaar</i>	$\nrightarrow$ AE.	$\rightarrow$ AE.	$\nrightarrow$ AE.
With <i>kaan</i>	Ambiguous reading	Ungrammatical (*)	$\nrightarrow$ AE.
With <i>ṣaar</i>	$\rightarrow$ AE.	Ungrammatical (*)	$\rightarrow$ AE.

Table (3). Actuality Entailments (AEs) in the MA root verbal modal $\backslash gdr \backslash$

So far, I have demonstrated all of the various interpretations of the two auxiliaries *ṣaar* and *kaan*; each auxiliary interacts distinctively with AEs. After I provided pieces of evidence about the existence of the perfect in MA, I observed that the MA perfect with auxiliaries has semantic consequences relative to the participle root modal *gaadir*. This semantic result is presented by the different behaviour of each auxiliary for triggering AEs. Accordingly, the variable behaviour toward AEs gives rise to the following questions:

1. Why are AEs present with the auxiliary *ṣaar*, but they are absent with the auxiliary *kaan*?
2. How can formal semantics contribute with a formal answer to question 1?

To answer the above questions, I explore two hypotheses. The first hypothesis is based on Portner's (2000; 2003) proposal that offers a formal account of the various readings of

the English perfect, as illustrated in Section 3.1.2. Under the first hypothesis, I predict that both auxiliaries are merged in the same position inside the perfect node and above *gaadir* in the derivation, as explained in Section 3.2.2. The second hypothesis, on the other hand, proposes that each auxiliary is projected in a different position relative to *gaadir*. Here, I follow Condoravdi's (2001) proposal for possibility modals in combination with the perfect *might have*, as explained in Section 3.2.3. I analyze Condoravdi's (2001) proposal in relation to the MA perfect in Section 3.2.4. Finally, I evaluate each approach in Section 3.2.5.

3.2 *Gaadir* interacting with the perfect

We have seen that MA provides us with novel data regarding the existence of perfect aspect within the MA aspectual system. In addition, the presence of the auxiliaries in the context of the participle root modal *gaadir* has semantic consequences relative to AEs. In this section, I explore recent semantic approaches that offer some insights to the MA perfect and the participle root modal *gaadir*. I will explore two hypotheses. In one of them, two different lexical entries are provided for *ṣaar* and *kaan*, which project in the structure in the same position (above *gaadir*). Under this view, the difference between the auxiliaries is lexical and AEs follow from the lexical difference. The other proposal investigates the hypothesis that the difference between the auxiliaries is structural. A single lexical entry leads to differences in AEs because the auxiliaries are specialized for different position within the syntactic tree: one projects above *gaadir* and the other below. The first hypothesis builds on work by Portner, the second builds on work by Condoravdi. My focus in this section is on perfect constructions with overt auxiliaries. I will not provide a formal account of perfect construction with silent auxiliaries (discussed earlier). A preliminary hypothesis is that both types of auxiliaries could be silent, but

future research is needed.

This section is structured as follows. I revisit Portner's (2000; 2003) perfect by presenting his formal account for the multiple flavours of the English perfect in Section 3.2.1. In Section 3.2.2, I examine my first hypothesis of the MA perfect in light of Portner's proposal. Afterwards, I explore my second hypothesis in the spirit of Condoravdi's (2001) proposal for epistemic possibility modals in combination with the perfect *might have* in Section 3.2.3. In Section 3.2.4, I apply Condoravdi's proposal on the MA perfect with the nominal root modal *gaadir*. Finally, I evaluate the two approaches in Section 3.2.5.

3.2.1 Portner's (2000; 2003) proposal for the English perfect

This section sets the background for the first hypothesis regarding the treatment of the MA perfect in the context of the participle root modal *gaadir* in light of Portner (2000, 2003). I discuss Portner's formal attempt to account for the various interpretations of the English perfect, as reported by Kratzer (1998); Klein (1994); Comrie (1976); Dowty (1979); a.o. By the end of this section, I adopt Portner's formal proposal to accommodate the cross-linguistic differences between English and the MA perfect.

Portner (2000, 2003) proposes to account for the various dimensions of the interpretation of the English perfect with an analysis that builds on two main components: one addresses the temporal properties of the perfect and the other the variety of flavours. Portner considers that the first part is in the semantics proper while the second is a pragmatic dimension. He proposes a modal characterization of the perfect where contextually supplied conversational backgrounds are responsible for deriving the variety of flavours/modal readings. My discussion in what follows focuses on the modal aspect.

The function of the pragmatic component is to determine the interpretation 'flavours' of the perfect, similar to the function of the conversational background with the differ-

ent flavours of modals (see discussion of modality in Chapter 1). Portner claims that the conversational background is the core element for the interpretation of the perfect in the same manner as with modals. With the perfect (as with modals), the conversational background identifies sets of propositions, and the sets of propositions determine the relevant accessible worlds. In what follows, I will present his ideas with focus on resultative and existential perfects, which will be the most relevant for the MA discussion. Let us see Portner's proposal for the resultative perfect with the toy example in (65), which I have discussed as an example of a 'resultative perfect'.

(65) Mary has read *Middlemarch*. (Portner, 2003, p.459)

Given (65), there exists a result state that is caused by Mary's reading of *Middlemarch*; this result state entails the following propositions:

- a. Mary is "smart".
- b. She understands George Eliot's style.
- c. She can explain George Eliot's style.

All of the above are the result of Mary's reading *Middlemarch*, which hold in the present time. Portner notes that this result has to be true to make the perfect felicitous. Accordingly, Portner proposes the following schema to capture the effects of the resultative perfect, as in (66).

(66) Cause (p , pres (s)) (Portner, 2000, p.4)

Here p stands for the proposition (Mary read *Middlemarch*), and s determines the result state. According to this proposal, the resultative perfect will be true only if there is a present result state that was caused by the truth of the proposition p . I will return to this when discussing the MA auxiliary *şaar*.

Portner also proposes an account for the so-called existential reading of the English perfect illustrated below.

(67) The earth has been hit by giant asteroids before (and probably will be again).

(Portner, 2003, p.459)

In (67), the resultative reading is missing, which also entails the absence of the causal relationship. As we have seen, this type of perfect is known as an ‘existential perfect’. To determine the flavour of the English perfect, contextual factors play a role in identifying the existential interpretation of the English perfect. For the existential perfect, Portner makes the proposal, as in (68).

(68) $O(p, \text{pres}(s))$

(Portner, 2000, p.4)

In this proposal, ‘O’ stands in for context-given implication relations that link the current state *s* to the truth of the proposition *p* (e.g. that *p* has been true in the past of *s*). For the existential perfect, the relation between *p* and *s* is thus more vague.

A comparison of the view of the resultative and existential perfects allow us to see underlying similarities, and Portner generalizes his proposal by using a necessity modal operator *P* which associates the proposition (*p*) under the scope of the perfect with the proposition that some current state (*s*) exists.

Since the modal relationship between the proposition *p* and the current state *s* can give rise to the resultative reading or the existential reading, the perfect is treated as a ‘single two-place modal operator *P*’. Accordingly, we obtain the multiple readings of the perfect through the analysis, as in (69).

(69) Presupposition of the perfect: A sentence *S* of the form TENSE (PERFECT($\emptyset$))

presupposes: $P(p, \text{TENSE}(s))$ where the interpretation of $P \in [\text{cause}, \text{contextual}]$

implication] and p=the proposition expressed by S. (Portner, 2000, p.5)

In the next section, I will explore an account of the differences between *şaar* and *kaan* with respect to AEs building on Portner's (2000; 2003) idea that resultative perfect invoke a result state. The proposal will be developed within the technical framework provided by Hacquard (2006, 2009). The hypothesis will be that *şaar* has a 'resultative perfect interpretation' while *kaan* has an 'existential perfect interpretation'.

3.2.2 The MA perfect under Portner's proposal

As stated earlier, I have formulated two hypotheses with respect to the MA perfect with auxiliaries. In this section, I examine the first hypothesis where the two auxiliaries are merged in the same position in the derivation, as schematized in (70).

(70) [Aspect Phrase (Kaan/Şaar) [Modal Phrase(gaadir)[.....]]]

As we have seen, MA differentiates the flavours of the perfect by the use of auxiliaries. (See Section 3.1.4 of this dissertation.) In this section I will propose an account of this that captures also the difference in the generation of AEs in combination with *gaadir*. The section is structured as follows: I will first discuss *şaar* and *kaan* in simple sentences without any modals, and then I will incorporate *gaadir* to the discussion. Below is the MA version of (72) with the corresponding LF. For simplicity, the complement in LF is written out in English:

(71) Fatimah şaarat qaariʔah *Middlemarch*.
 Fatimah şaar.3.F.SG.PFV. ABLE.Participle.3.F.SG. *Middlemarch*
 'Fatimah had managed to read *Middlemarch*.' ('had come to read')

(MA Resultative Reading)

(72) *TP*[Past [Aspect Phrase Şaar [Fatimah read *Middlemarch*]]]

Given the insights in Portner (2000, 2003), we know that resultative perfect *şaar* will introduce two eventualities, an event and its result state. What is the modal anchoring of these eventualities? Looking ahead to cases where *şaar* interacts with the participle root modal *gaadir*, we can see that *şaar* anchors eventualities in the actual world. I will follow Hacquard's (2006; 2009) strategy for perfective aspect and claim that perfect *şaar* (like French perfective) anchors eventualities to the actual world. Which eventualities? Given that *şaar* is special in introducing a result state, my claim will be that the result state is located in the actual world. I propose the denotation for *şaar*, as in (73).

$$(73) \quad [[\text{\textit{Şaar}}]]^{w, \leq C} = \lambda P_{\langle \ell, t \rangle}. \lambda t_i. \exists e_{\ell} [P(e)=1 \wedge \exists s: s \in w \wedge \text{cause}_{(w)}(e)(s) \wedge \text{time}(s) \subseteq t]$$

According to (73), *şaar* combines with a property of events *P* and outputs a property of times. A *şaar*-sentence will be true iff there is an event *e* with the *P* property and there is a results state *s* caused by *e* in the actual world *w* and the run time of *s* is within the reference time *t*. Given that *s* is in the actual world /evaluation world, and *e* causes *s*, *e* must also be in the actual world.⁸ As expected, in a non-modal sentence, both *e* and *s* will be actual. By locating the run-time of *s* within the reference time, I can account for the fact that resultative perfect locates result states in time (these are somehow ‘focused’). Let us apply the proposed lexical entry for the auxiliary *şaar* to the toy Example (72):

$$(74) \quad [[[\text{\textit{Şaar}}]]^{w, \leq C} ([[\text{\textit{VP}}]])^{w, \leq C}$$

In (74), the auxiliary *şaar* needs to combine with the denotation of the VP *Fatimah read Middlemarch*. I will take the VP to denote a property of events of Fatimah reading *Middlemarch* in the evaluation world (following the conventions in Hacquard (2006, 2009):

⁸It is a standard assumption in possible world semantics that causation relations are world-bound. Causation cannot happen across worlds.

$\lambda e.\text{read}(e, \text{Fatimah}, \text{Middlemarch}, w)$. The result will be as below:

$$(75) \quad [\lambda t_i. \exists e_\ell. [\text{read}(e, \text{Fatimah}, \text{Middlemarch}, w) \wedge \exists s: s \in w \wedge \text{cause}_{(w)}(e)(s) \wedge \text{time}(s) \subseteq t]]$$

In (75), this is a property that is true of a time t iff there is an event e of Fatimah reading *Middlemarch* in the evaluation world w and there is a state s in the evaluation world w caused by e and the run-time of s is included in t . Adopting the referential theory of tense sketched in (76) by Hacquard (2006, 2009), the result of combining AspP with T is given below:

$$(76) \quad [[[(71)]]]^{w, \leq C} = 1 \text{ iff } \exists e_\ell. [\text{read}(e, \text{Fatimah}, \text{Middlemarch}, w) \wedge \exists s: s \in w \wedge \text{cause}_{(w)}(e)(s) \wedge \text{time}(s) \subseteq t' \{t' \leq t^*\}]]$$

The sentence in (71) will be true iff there is a reading event of *Middlemarch* by Fatimah in the evaluation world w , and there is a result state s caused by the reading event e in the evaluation world w . Tense locates the result state s in the past, and the reading event that caused s is earlier in the past.

Having demonstrated the computation of the MA resultative perfect with the auxiliary *şaar*, I add the participle root modal *gaadir* under the perfect, as shown in (71), repeated as (77) below. As described earlier, when the MA perfect with *şaar* is associated with the participle root modal *gaadir*, this type of association always yields AEs.

$$(77) \quad \begin{array}{lll} \text{Fatimah } \text{şaarat} & \text{gaadrah} & \text{tiqra?} \\ \text{Fatimah } \text{şaar.3.SG.F.PFV.} & \text{gaadrah.Participle.3.SG.F.} & \text{3.SG.F.read.IMPFV.} \\ \text{Middlemarch.} & & \\ \text{Middlemarch} & & \\ \text{'Fatimah had managed to read Middlemarch.'} & & (\text{MA: + AEs}) \end{array}$$

$$(78) \quad TP[\text{Past } [_{\text{Aspect Phrase}} \text{Şaar } [_{\text{Modal Phrase}} \text{gaadir } [\text{Fatimah read Middlemarch}]]]]$$

The first step is to spell out the denotation for *gaadir*. Following Hacquard (2006, 2009)

I make the proposal in (79) (as Hacquard, I ignore the ordering source).

$$(79) \quad [[\text{Gaadir}]]^{w,B,\leq C} = \lambda P_{\langle s, \ell, t \rangle}. \lambda e_{\ell}. \exists w' \text{ compatible with circumstances in } w: P(w')(e) = 1$$

Given this proposal, the participle *gaadir* is an existential circumstantial modal. It combines with the VP *Fatimah read Middlemarch* by IFA, as illustrated in the modal phrase in (80).⁹

$$(80) \quad [[\text{ModP } gaadir \text{ } [_{VP} \text{ Fatimah read } Middlemarch]]]^{w,B,\leq C} \\ = [[gaadir]]^{w',B,\leq C} (\lambda w'. [[\text{Fatimah read } MiddleMarch]]^{w',B,\leq C})_{(IFA)}.$$

$$(81) \quad = \lambda e_{\ell}. \exists w'' \text{ compatible with circumstances in } w: \text{read}(e, \text{Fatimah}, \text{Middlemarch}, w'')$$

The result is a property of events true of an event e iff there exists a world w' compatible with the circumstances in the evaluation world w in which e is an event of Fatimah reading *Middlemarch*.

At this level of the computation, the participle root modal *gaadir* has to be associated with the aspectual phrase. To obtain the resultative perfect, the auxiliary *saar* needs to be attached with the modal phrase, as in (82):

$$(82) \quad [[\text{\$aar}]]^{w,B,\leq C} ([[\text{Modal Phrase}]])^{w,B,\leq C}$$

The result of this combination is as in (83):

$$(83) \quad \lambda t_i. \exists e_{\ell} [\exists w'' \text{ compatible with circumstances in } w: \text{read}(e, \text{Fatimah}, \text{Middle-}$$

⁹As defined in Section 2.4.1. in Chapter 2, the aspect phrase is merged above the root modal, the root modal combines with the VP complement. Before combining the root modal with the VP complement, the semantic type of the VP complement is of type $\langle \ell, t \rangle$, so this type has to be converted into type $\langle s, \ell, t \rangle$. We need to make the semantic types of the root modal and the VP complement compatible with each other by applying an ‘Intensional Functional Application’ (IFA) Kratzer and Heim (1998). The role of IFA is to shift the semantic type of the VP complement into type $\langle s, \ell, t \rangle$.

$$march, w'') \wedge \exists s: s \in w \wedge \text{cause}_{(w)}(e)(s) \wedge \text{time}(s) \subseteq t]$$

The result is a property of times true of a time t iff there exists an event e and there exists a world w' compatible with the circumstances in the evaluation world w in which e is an event of Fatimah reading *Middlemarch* and there is a state s in w that is caused by e and the run-time of s is included in t .

Next, the aspect phrase has to be associated with the tense phrase to locate the denotation of the result state, into a time before the speech time, as shown in (89). Adopting Hacquard's referential theory of tense, the combination of AspP and T will result in the truth-conditions in (84):

$$(84) \quad [(((77)))]^{w,B,\leq C}=1 \text{ iff } \exists e_\ell [\exists w'' \text{ compatible with circumstances in } w: \text{read}(e, \text{Fatimah, Middlemarch, } w'') \wedge \exists s: s \in w \wedge \text{cause}_{(w)}(e)(s) \wedge \text{time}(s) \subseteq t' \{t' \leq t^*\}]$$

The sentence in (84) will be true iff there is an event such that in a world w' compatible with the circumstances in the evaluation world w , it is an event of Fatimah reading *Middlemarch*. This event causes a result state s in the evaluation world, and tense locates the result state in the past. Given Hacquard's PED, the properties of the event will be the same across worlds. This means that the event will also be an event of Fatimah reading *Middlemarch* in the evaluation world w . In this way, we have derived the AE associated with *şaar*.

For Sentence (77) to be true, the result of reading *Middlemarch* by Fatimah is anchored in the actual world. Her reading *Middlemarch* entails that she is smart, she understands George Eliot's style, and her reading abilities are advanced. Any continuation stating that she did not read and understand *Middlemarch* comes out as a contradiction.

To sum up, I have elucidated the computation of the perfect with *şaar* in both the modal-free context and the modal context. I proposed the lexical entry of the perfect with

ṣaar in line with Hacquard’s perfective. Like the perfective, my proposed lexical entry of the MA resultative perfect with *ṣaar* locates an eventuality (in this case the result state *s*) in the world of evaluation *w*. Therefore, AEs are successfully obtained under this proposal.

I will now turn to examples with the *kaan* auxiliary. As we have seen in Section 3.1.4., it gives rise to an ‘existential reading’ in a modal-free sentence. The combination of the auxiliary *kaan* and the participle root modal *gaadir* does not invoke AEs. Let us start the computations of the auxiliary *kaan* with a modal-free example, and then incorporate the participle root modal *gaadir*, as in (85).

- (85) Ṭaḡraam Ṭimlaakah kaanat muxtariqah
 asteroids giant.F. kaan.3.SG.F.PFV. break.through.Participle.3.SG.F.
 l-ṭilaaf l-ṭawie.
 the-atmosphere the-space
 ‘Giant asteroids had hit the atmosphere of Earth.’ (MA: Existential Perfect)

Without the participle root modal *gaadir*, the intuitions behind the auxiliary *kaan* trigger the existential interpretation of the event denotation. I propose to capture the existential interpretation of the auxiliary *kaan* on the basis of the well-known proposal made by Kratzer (1998) for the English perfect (adopted for the perfect by Hacquard). According to this proposal, the existential perfect does not introduce a result state *s* but simply places an eventuality before the reference time, as in (76). The event is not related to the evaluation world. The expectation is that AEs will not be triggered, as in (86).

- (86) $[[\text{Kaan}]]^{w,C} = \lambda P_{\langle s \rangle \langle \ell, t \rangle}. \lambda t_i. \lambda w'. \exists e_\ell [P(w)(e)=1 \wedge \text{time}(e) < t]$

According to (86), *kaan* combines with a property of events *P* and outputs a property of times and worlds. A *kaan*-sentence will be true at a time *t* and world *w'* iff there is an event *e* with a property of *P* such that *e* is in *w*, and the run time of *e* is over by the

reference time t . As you can see, the property of event does not have a resultative relation with *kaan*, rather an existential interpretation.

Let us put all the pieces together to compute the meaning of a modal-free sentence with the perfect with the auxiliary *kaan*, as in (87).

- (87) Fatimah kaanat gaadrah tiqra?
 Fatimah kaanat.3.SG.F.PFV. gaadrah.Participle.3.SG.F. 3.SG.F.read.IMPV.
 Middlemarch.
 Middlemarch
 ‘Fatimah had read *Middlemarch*.’ (MA)

In (86), the denotation of the event e is associated with the perfect with *kaan*, and the obtained result is given in (88) (via IFA).

$$(88) \quad [[\text{Kaan}]]^{w,B,\leq C} ([[\text{VP}]]^{w,B,\leq C})$$

$$(89) \quad \lambda t_i. \lambda w. \exists e_\ell [\text{read} (e, \text{Fatimah}, \text{Middlemarch}, w)] \wedge \text{time}(e) < t]$$

This is a property that is true of a time t and a world w iff there is an event e of Fatimah reading *Middlemarch* in w and the run-time of e is over by t . Given the referential theory of tense by Hacquard (2006, 2009), the result of associating AspP with T is shown in (91).¹⁰

$$(90) \quad [[\text{Aspect Phrase}]]^{w,B,\leq C} ([[\text{Past}]]^{w,B,\leq C})$$

$$(91) \quad [[(87)]]^{w,\leq C} = \lambda w. \exists e_\ell [e \in w: \text{read} (e, \text{Fatimah}, \text{Middlemarch}, w)] \wedge \text{time}(e) < t \{ t < t^* \}]$$

Sentence (91) will be true at a time t and a world w iff there exists an event e which is a reading event of *Middlemarch* by Fatimah in w , with tense identifying that the event is over by some past time.

¹⁰It would be argued that in the case of *kaan*, a world variable is projected in the syntax to identify a truth value. This remains for future research.

In the above discussion, I have illustrated the denotations that are required to compute the MA perfect with the auxiliary *kaan* to invoke the existential perfect in a modal-free context. In what follows, I present the computation of the perfect with the auxiliary *kaan* in association with the participle root modal *gaadir*. In addition, I will use the same lexical entry of *gaadir* given earlier in (79) in light of Hacquard (2006, 2009). Given this proposal, *gaadir* is an existential circumstantial modal, and it combines with the VP *Mary sneezed* by IFA, as in (93).

- (92) Mary kaanat gaadrah tiṣṭus.
 Mary kaan.3.SG.F.PFV. ABLE.Participle.3.SG.F. 3.SG.F.sneeze.IMPFV.
 ‘Mary could have sneezed.’ (MA: -AEs)
- (93) $[[\text{Gaadir}]]^{w,B,\leq C} ([[\text{VP}]]^{w,B,\leq C})$

Following the combination of *gaadir* with the VP *Mary sneezed*, the type of the VP has to shift into type $\langle s, \langle \ell, t \rangle \rangle$ by the application of IFA. And thus we obtain in the following result, as illustrated in (94).

- (94) $[\lambda e_{\ell}. \exists w' \text{ compatible with circumstances in } w: \text{sneezed}(e, \text{Mary}, w')]$

In (94), the result is a property of events true of an event e iff there exists a world w' compatible with the circumstances in the evaluation world w in which e is an event of Mary sneezing.

- (95) $[[\text{Kaan}]]^{w,B,\leq C} ([[\text{Modal Phrase}]]^{w,B,\leq C})$

At this level of the computation, the participle root modal *gaadir* combines with the perfect with the auxiliary *kaan*, as in (95). The result of this combination is given in (96).

- (96) $\lambda t_i. \lambda w''. \exists e_{\ell} [\exists w' \text{ compatible with circumstances in } w'': \text{sneezed}(e, \text{Mary}, w') \wedge \text{time}(e) < t]$

In (96), the result is a property of times true of a time t and a world w iff there exists a world w' compatible with the circumstances in w and there exists an event e in w' that is an event of Mary sneezing. The run-time of e is over by t .

The final step in the computation is to combine the computation of (97) with tense.

$$(97) \quad [[\text{Aspect Phrase}]]^{w,B,\leq C} ([[\text{Past}]])^{w,B,\leq C}$$

$$(98) \quad \lambda w'' . \exists e_\ell [\exists w' \text{ compatible with circumstances in } w'' : \text{sneezed}(e, \text{Mary}, w') \wedge \text{time}(e) < t \{t < t^*\}]$$

Sentence (98) will be true in a world iff there is an event e in w such that in a world w' compatible with the circumstances in w , e is an event of Mary sneezing. Tense locates the sneezing event in the past interval before the speech time (s^*).

As we can see in (98), the presence of the auxiliary *kaan* before the participle root modal *gaadir* does not force the event of sneezing by Mary to be actualized. Since it is not in the evaluation world w , Hacquard's default pragmatic principle PED has no actual consequences. The result is that AEs are not triggered with the auxiliary *kaan*. Rather, the counterfactual reading is available for Example (97). This type of MA perfect with the auxiliary *kaan* reflects Hacquard's (2014) claim that AEs do not obtain with the perfect (in French).

To summarize, in this section, I examined the first hypothesis where the two auxiliaries, *šaar* and *kaan*, are merged in this same position under the perfect phrase. I argue that the MA perfect is lexically disambiguated by having two different auxiliaries *šaar* and *kaan*, unlike the English perfect as described in Section 3.1.2. To capture the MA resultative perfect with the auxiliary *šaar*, I revise Hacquard's (2006; 2009) lexical entry for the perfective. This modified version will help us to obtain AEs in the context where

the participle root modal *gaadir* combines with the perfect with the auxiliary *şaar*. For the computation of the perfect with the auxiliary with *kaan*, I also follow the well-known proposal by Kratzer's (1998) lexical entry for the perfect. By doing so, AEs are not generated. In the following section, I will explore the second hypothesis where each auxiliary is projected in a different position relative to the participle root modal *gaadir*.

3.2.3 Condoravdi's (2001) proposal for the multiple readings of *might have* relative to *gaadir*:

I will now turn to the second hypothesis where each auxiliary—*kaan* and *şaar*—is located in a different position with respect to the nominal root modal *gaadir*. This second hypothesis is formulated in the spirit of Condoravdi (2001), who has argued that the relative scope of temporal operators and modals has important consequences for modality. I will begin in this section by presenting Condoravdi's account of the interaction between modals and aspect, and in the next section (see Section 3.2.4), I will adapt the proposal to investigate the AEs effects of *şaar* and *kaan*.

Condoravdi observes that the combination of the possibility modal *might* with *have* leads to ambiguity in the interpretation of a sentence, as shown in (99).

(99) He might have won the game.

- a. He might have won the game (#but he didn't). (Epistemic Reading)
- b. At that point he might (still) have won the game but he didn't in the end. (Counterfactual Reading)

The combination can receive either an epistemic reading ('it is possible given what we know now that he won the game in the past'), or a circumstantial (counterfactual) reading ('it was possible in the past that he would win the game').

Condoravdi develops a proposal to account for this ambiguity. In her account, she focuses on the interaction between the Modal Base (MB) parameter and the interpretation of aspect. (She simplifies and excludes the role of the ordering source.) Condoravdi's epistemic MB is a contextually determined function from world-time pairs (w, t) to sets of worlds. My presentation of Condoravdi's proposal focuses on the ideas that will be most relevant for the discussion of MA AEs.

I will begin with Condoravdi's account of the epistemic reading. This reading is derived from a structure in which the modal scopes over the perfect aspect. The highlights of the derivation of the truth-conditions are provided in (121-125). For the 'present perspective with a past orientation', as shown (100).

(100) He might have won.

- a. He win: $\lambda w. \lambda e. [\text{he win}] (w) (e)$
- b. PERF (he win): $\lambda w. \lambda t. \exists t' [t' < t \wedge \exists e [[\text{he win}] (w) (e) \wedge \text{time} (e, w) \subseteq t']]$
- c. Might_{MB} (PERF (he win)): $\lambda w. \lambda t. \exists w' [w' \in MB (w, t) \wedge \exists t' [t' < [t, \text{now}) \wedge \exists e. [[\text{he win}] (w') (e) \wedge \text{time} (e, w') \subseteq t']]]$
- d. $\text{PRES}(\text{MIGHT}_{MB} (\text{PERF} (\text{he win})))$: $\lambda w. \exists w' [w' \in MB (w, \text{now}) \wedge \exists t' [t' < [\text{now}, \text{now}) \wedge \exists e [[\text{he win}] (w') (e) \wedge \text{time} (e, w') \subseteq t']]]$ (Condoravdi, 2001, p.15)

In (100), there is a possibility modal whose interpretation depends on the speaker's knowledge at the speech time ('now') (i.e. it has an epistemic MB). The sentence will be true iff in some world compatible with the speaker's knowledge at the speech time, there is an eventuality of him winning the game that takes place at an interval before now. Whether or not he won the game is something that is already determined before the time of utterance—in the past. However, the speaker presumably does not know which way

it was settled. This type of epistemic interpretation has a past orientation with a present perspective.

The second reading is predicted to arise when perfect aspect scopes over the modal, as illustrated below for ‘backward-then-forward-shifting modals’. In (101), the possibility modal is interpreted with respect to a circumstantial MB. The modal interpretation has a past perspective and a future orientation. It was possible given circumstances in the past that we would win the game. The outcome of the derivation of this interpretation is provided below:

- (101) PRES (PERF(MIGHT_{MB} (he win))): $\lambda w. \exists w'. \exists t'. [t' < \text{now} \ \& \ w' \in \text{MB} (w, t') \ \& \ \exists e \ [[\text{he win}] (w')(e) \ \& \ \text{time} (e, w') \subseteq [t',)]]$ (Condoravdi, 2001, p.17)

The truth conditions of statement (101) are as follows. The sentence will be true iff there is a world compatible with the actual world circumstances at some past time, and in that world there is an event of him winning the game that takes place to the future of that past time.

What is most important to our proposal is that in Condoravdi’s account, the position of the modal relative to the perfect aspectual head has consequences for the modal interpretation. I will build on this when examining *şaar* and *kaan* in the next section. One important difference between the MA data and Condoravdi’s examples is that the modal *gaadir* can only obtain a circumstantial reading. This will be relevant in deriving the presence or absence of AEs.

3.2.4 The MA perfect under Condoravdi’s proposal

In this section, I will explore MA data with insights from Condoravdi. The guiding hypothesis is that the perfect auxiliaries *şaar* and *kaan* have uniform semantics but are specialized regarding their syntactic position, with *kaan* projecting above the modal *gaadir*

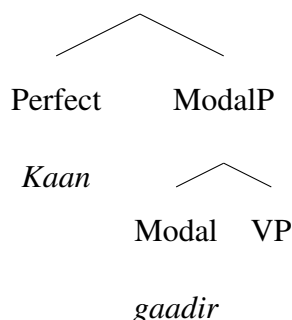
and *ṣaar* below. I repeat relevant examples below, without and with AEs:

- (102) Ṣasem kaan gaadir yirfaṯ
 Asem kaan.3.SG.M.PFV. ABLE.Participle.3.SG.M. 3.SG.M.lift.IMPFV.
 ʔa-θθalaaʒah_i, bus ma rafṯ-ha_i.
 ʔ.the-fridge.F., but not lift.3.SG.M.PFV-it.F.
 ‘Asem could have lifted the fridge, but he did not do it.’ (MA: -AE)

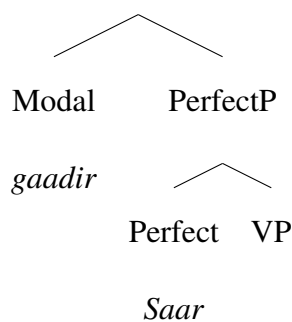
- (103) Ṣasem ṣaar gaadir yirfaṯ
 Asem ṣaar.3.SG.M.PFV. ABLE.Participle.3.SG.M. 3.SG.M.lift.IMPFV.
 ʔa-θθalaaʒah_i, #bus ma rafṯ-ha_i.
 ʔ.the-fridge.F.,# but not lift.3.SG.M.PFV-it.F.
 ‘Asem had managed to lift the fridge,# but he did not do it.’ (MA: +AE)

The hypotheses for the corresponding syntactic structures are presented in (104) and (105).

- (104) PerfectP (No AEs)



- (105) ModalP (AEs)



As we will see, the different positions of the aspectual heads interacting with the circumstantial modal will have consequences regarding the generation of AEs.

I will start by spelling out the basic denotations. The denotation of *ṣaar* and *kaan* is

uniform, as illustrated in (106).

$$(106) \quad [[\text{\$aar/Kaan}]]^{w,B,\leq C} = \lambda P_{<i<s,t>>}. \lambda t_i. \lambda w_s. \exists t'' [t'' < t \wedge P(t'')(w)=1]$$

The modal *gaadir* is interpreted as a circumstantial possibility modal (following Condoravdi's proposal):

$$(107) \quad [[\text{Gaadir}]]^{w,B,\leq C} = \lambda p_{<i<s,t>>}. \lambda t_i. \lambda w''_s. \exists w' [w' \in \text{MB}_{cir}(w'',t) \wedge P(t)(w')=1]$$

I propose that the VP denotes a property of times that will be manipulated by the aspectual heads, as in (108). The VP locates an event within an interval.

$$(108) \quad [[\text{VP}]]^{w,B,\leq C} = \lambda t'_i. \lambda w'_s. \exists e_\ell [e \in w': \text{lift the fridge}(e, \text{Asem}, w') \wedge \text{time}(e) \subseteq [t', -]]$$

Let us begin with the case of *kaan*. This will be similar to Condoravdi's proposal for cases where the perfect scopes over circumstantial *might*. The first step is to combine the modal *gaadir* with the VP as in (109), with the result in (110):

$$(109) \quad [[\text{Gaadir}]]^{w,B,\leq C} ([[\text{VP}]])^{w,B,\leq C}$$

$$(110) \quad \lambda t'_i. \lambda w_s. \exists w' [w' \in \text{MB}_{circ}(w, t') \wedge \exists e_\ell [e \in w': \text{lift the fridge}(e, \text{Asem}, w') \wedge \text{time}(e) \subseteq [t', -]]]$$

In (110), this is a property true of a time t' and a world w iff there exists a world w' that matches the circumstances of w up to t' and in w' there is an event of Asem lifting the fridge to the future of t' . This property of times will combine with the perfect *kaan* which will shift the modal accessibility time to the past, as in (111).

$$(111) \quad [[\text{Kaan}]]^{w,B,\leq C} ([[\text{Modal Phrase}]])^{w,B,\leq C}$$

$$(112) \quad [\lambda t_i. \lambda w_s. \exists t'' (t'' < t \wedge [\exists w' [w' \in MB_{circ}(w, t'') \wedge \exists e_\ell [e \in w': \text{lift the fridge} \\ (e, Asem, w') \wedge \text{time}(e) \subseteq [t'', \text{---}]]]$$

When the perfect with *kaan* is under the scope of present tense, the relevant reference interval is “now”. I also pursue Condoravdi’s lexical entry for the present, as described in (100), and the final results are shown in (114).¹¹

$$(113) \quad [[\text{Aspect Phrase}]]^{w,B,\leq C} ([\text{Present}])^{w,B,\leq C}$$

$$(114) \quad [(((102)))^{w,B,\leq C} = \lambda w_s. \exists t'' (t'' < \text{now} \wedge [\exists w' [w' \in MB_{circ}(w, t'') \wedge \exists e_\ell [e \in w': \\ \text{lift the fridge} (e, Asem, w') \wedge \text{time}(e) \subseteq [t'', \text{---}]]]$$

The sentence in (102) will be true iff there is a world w' which matches the circumstances in the actual world up to a time t'' (before now) in which there is an event of Asem lifting the fridge after t'' . This interpretation is compatible with the counterfactual reading, which does not give rise to AEs.

The hypothesis is that in MA, the auxiliary *saar* is the projection of the perfect auxiliary below the modal (see Example (105)). I will start by presenting the highlights of the derivation, and then discuss AEs. In the case of the structure in (105), *saar* combines first with the VP as illustrated in (115), with the results in (116):

$$(115) \quad [[\text{Saar}]]^{w,B,\leq C} ([[\text{VP}]]^{w,B,\leq C})$$

$$(116) \quad \lambda t_i. \lambda w_s. \exists t'' [t'' < t \wedge \exists e_\ell [e \in w: \text{lift the fridge} (e, Asem, w) \wedge \text{time}(e) \subseteq [t'', \text{---}]]]$$

Given the position of the perfect under the scope *gaadir*, the combination of *gaadir* and the aspectual phrase will be as (117), with the outcome in (118):

$$(117) \quad [[\text{Gaadir}]]^{w,B,\leq C} ([[\text{Aspect Phrase}]]^{w,B,\leq C})$$

¹¹Condoravdi considers that the time interval where the event is located is right-bounded by ‘now’ as well-not indicated here.

$$(118) \quad \lambda t_i. \lambda w_s. \exists w' [w' \in MB_{circ}(w, t) \wedge \exists t'' [t'' < t \wedge \exists e_\ell [e \in w': \text{lift the fridge } (e, Asem, w') \wedge \text{time}(e) \subseteq [t'', \text{---}]]]$$

Once we factor in the contribution of the present tense ((119)), we will obtain the truth-conditions in (120):

$$(119) \quad [[\text{Modal Phrase}]]^{w, B, \leq C} ([[\text{Present}]])^{w, B, \leq C}$$

$$(120) \quad [[(103)]]^{w, B, \leq C} = \lambda w_s. \exists w' [w' \in MB(w, \text{now}) \wedge \exists t'' [t'' < \text{now} \wedge \exists e_\ell [e \in w': \text{lift the fridge } (e, Asem, w') \wedge \text{time}(e) \subseteq [t'', \text{---}]]]$$

Sentence in (103) will be true in w iff there is a world w' that matches the circumstances of w up to the speech time and there is a time t'' before the speech time in which there is an event of Asem lifting the fridge in w' . Given that w' matches the circumstances of the actual world up to now, if there is an event of Asem lifting the fridge in w' before now, there will also be such an event in the actual world. The modal base selects worlds that are like the actual world up to the speech time, so modal quantification will have no impact if events are located in the past of the speech time (the modal claim will be true iff the event is actual.) The result is that AEs will be generated.

To summarize, I have discussed a second hypothesis building on Condoravdi's influential proposal to account for the semantic ambiguity of the English modal *might* with the perfect *have*. Following Condoravdi, I propose that the auxiliaries *kaan* and *şaar* have a unified lexical entry. However, different scope effects between the two auxiliaries with the root modal lead to different semantic consequences. When the perfect with the auxiliary *kaan* scopes above the modal *gaadir*, AEs are blocked (as with the counterfactual “might have”). When the perfect with the auxiliary *şaar* is under the modal *gaadir*, AEs are always generated. Since *gaadir* cannot be epistemic, only actualized interpretations

are possible. In what follows, I evaluate the two discussed hypotheses, which I propose to resolve the empirical puzzle of the MA perfect with the auxiliaries *kaan* and *şaar*. I show which of these hypotheses better captures the empirical puzzle behind the association of the MA perfect with the participle root modal *gaadir*.

3.2.5 Evaluation

This section is devoted to the evaluation of the two hypotheses regarding the computation of the MA perfect with *şaar* and *kaan*. The first hypothesis is established on the basis of Portner's (2000; 2003) proposal for the multiple readings of the English perfect. The second hypothesis, on the other hand, is based on Condoravdi's (2001) proposal to account for the ambiguity of sentences with *might have*.

In my view, both proposals offer interesting analyses regarding the MA perfect in association with the participle root modal *gaadir*. However, one hypothesis seems better able to handle the subtle differences that arise between *şaar* and *kaan* in interaction with *gaadir*. In what follows, I show the main reasons for choosing the first hypothesis inspired by Portner (2000, 2003) over the second hypothesis inspired by Condoravdi (2001).

I find the proposal inspired by Portner (2000, 2003) more appealing based on the following evidence relative to MA's richer morphological system. First, the independent lexical entries for the auxiliaries seem better able to capture the resultative reading with *şaar* vs. the existential reading with *kaan*. (Even though the two auxiliaries are merged in the same location under the perfect node.) It is interesting from the point of view of cross-linguistic variation that MA seems to articulate in its lexicon differences that English groups under a single morpheme (have). Second, the proposal inspired by Portner (2000, 2003) is able to incorporate insights from Hacquard's treatment of the perfective, thus bringing the contrast between *şaar* and *kaan* in line with cross-linguistic observations in

the literature.

The second hypothesis is also novel with respect to MA modality, and links the differences to the structure. While it may be that the hypothesis allows us to derive correct results for AEs, it fails to capture intuitions about the basic differences between the perfects accessible to native speakers even in the absence of the modal. In other words, if the participle modal *gaadir* is removed from the derivation, in a modal-free sentence, we cannot distinguish between the types of the MA perfect. Given the unified lexical entry of the auxiliaries *kaan* and *ṣaar*, we cannot differentiate between the existential perfect with the auxiliary *kaan* from the resultative perfect with the auxiliary *ṣaar*.

Finally, my proposal differs from Condoravdi relative to the type of the modal that I investigate with the perfect. I examine a root modal with a circumstantial modal base in relation to the MA perfect with the auxiliaries *kaan* and *ṣaar*. Condoravdi, on the other hand, analyzes the modal *might* when it has an epistemic modal base (MB) to invoke a ‘possibility interpretation’. She also looks at the same modal when it has a circumstantial MB to generate a ‘counterfactual reading’.

3.3 Conclusion

In this chapter, I have examined Hacquard’s (2014) recent claim regarding the relative association between the French root modals and the perfect. Under this claim, AEs are absent with the perfect. With respect to MA, I survey studies on the Arabic perfect, and two studies, by Fassi Fehri (2003) and Boneh (2010), explore the existence of the Arabic perfect. These studies argue that perfect aspect is present where an auxiliary *kaan* precedes an imperfective verb, as in Fassi Fehri (2003), or a participle, as in Boneh (2010). My research shows that the combination of the auxiliaries *kaan* and *ṣaar* with the MA participle represents the MA perfect.

I showed that each auxiliary leads to different interpretations of the perfect. With the auxiliary *kaan*, the MA perfect always has an ‘existential perfect’ while the auxiliary *ṣaar* always has a ‘resultative perfect’. This fact is a novel observation in the literature of Arabic aspect in general, and in MA specifically. This MA perfect observation is reminiscent of Portner’s (2000; 2003) proposal for the various flavours of the English perfect.

To resolve this empirical puzzle, I explore recent semantic approaches that provide some insights to the MA perfect and the participle root modal *gaadir*. I consider two hypotheses. The first hypothesis is built on Portner’s (2000; 2003) proposal for the English perfect. For the MA perfect, I argue that two different lexical entries are offered for *ṣaar* and *kaan*. The two auxiliaries project in the structure in the same position, specifically above the participle modal *gaadir*. In this view, the difference between the auxiliaries is lexical and AEs follow from the lexical difference. For the perfect with the auxiliary *kaan*, I follow Kratzer’s (1998) well known lexical entry for the English perfect. For the perfect with the auxiliary *ṣaar*, I adopt Hacquard’s (2006; 2009) proposal for the perfective to generate AEs. However, I amend Hacquard’s perfective to account for the resultative relation noticed with the MA perfect with the auxiliary *ṣaar*.

The second hypothesis is inspired by Condoravdi’s (2001) proposal to account for the ambiguity reported in English with the epistemic modal *might* with *have might have*. Under this view, I hypothesize that the difference between the auxiliaries is structural. A single lexical entry leads to differences in AEs. The auxiliaries are specialized for different position within the syntactic tree: one projects above *gaadir* and the other below. A formal account of perfects with no overt auxiliaries remains for future research.

Chapter 4

The semantics of the modal *qad*

4.1 Introduction

In this chapter, I explore the semantic behaviour of the semi-modal *qad* in Makkan Arabic (MA).¹ I examine the semantic interaction between *qad* and the different aspects. This research is a continuation of the growing literature that is interested in understanding the way modal interpretation interacts with temporal interpretation (already elaborated on in Chapters 2 and 3 of this dissertation; e.g., Bhatt (1999; 2006), Hacquard (2006; 2009); a.o.).

My investigation of MA data reveals that the modal *qad* has multiple flavours due to its association with different types of aspect in the modal's VP complement. The focus of Chapter 4 will be on those in which the modal *qad* appears to have an epistemic modal flavour. The exact nature of this epistemic modal flavour varies depending on whether the VP complement of the modal *qad* is in perfective or imperfective aspects. In what follows, I present a minimal pair where there is an imperfective complement in (1) and a perfective complement in (2). (More examples will be discussed in Section 4.2.2 for the imperfective complement and in Section 4.2.3 for the perfective complement.)

Imagine a scenario where Fatimah lives in British Columbia, and she is invited to Muna's wedding in Ottawa. The wedding will take place next week. Muna is wondering

¹The modal *qad* is pronounced as *gad* in contexts throughout this chapter. *Qad* does not inflect.

whether Fatimah can come to her wedding, and the speaker says the statement in (1).

- (1) Fatimah qad ti-fiḍur l-faraḥi l-ḥusbuḥ l-qadim.
Fatimah.F. qad 3.SG.F.-go.IMPFV. the-wedding the-week the-next
'Fatimah might be going to the wedding next week.' (MA)

Now, suppose that Muna's wedding is last weekend in Ottawa. Two friends of Muna could not attend the wedding as they have night shifts, and they are wondering if Fatimah managed to travel to Ottawa for Muna's wedding. In this context, the speaker says the statement below, in (2), generating AEs.

- (2) Fatimah qad fiḍarat l-faraḥi l-ḥusbuḥ l-maḍi.
Fatimah.F. qad go.3.SG.F.PFV. the-wedding the-week the-last
'Fatimah indeed went to the wedding last week.' (MA)

The imperfective example leads to an epistemic claim about the future, the perfective example generates AEs about the past.

My observation surrounding the epistemic flavour of the modal *qad* requires revisiting the literature on modality and aspect, since there is an orthodox view in this literature that AEs are missing with epistemic modals, as pointed out by Hacquard (2006; 2009) and Portner (2009), stated by Portner as in (3).

- (3) "Epistemic modals do not show actuality entailment." (Portner, 2009, p.204)

To the best of my knowledge, this interaction between the epistemic modals and perfective aspect has not been explored or even examined cross-linguistically on the basis of formal semantics.

After my analysis of the association between the root modal *\gdr* and the perfective in Chapter 2, the reader may have the following question: what is the difference between the MA root modal *\gdr* and the MA semi-modal *qad* relative to aspect? Before I delve into a theoretical discussion about the epistemic modal *qad*, I present two differences

between the root modal \gdr\ and the epistemic modal *qad* below.

First, the verbal root modal \gdr\ is different from the MA epistemic semi-modal *qad* in that the former carries aspectual morphology (perfective versus imperfective) (see the discussion in Chapter 1). The perfective form of the root modal is *gidir*, as in (4), while the imperfective form is *yi-gdar*, as in (5).

- (4) ʔahmad gidir yi-sbafi fi l-bufiayrah.
Ahmad ABLE.3.SG.M.PFV. 3.M.-swim prep. the-lake
‘Ahmad managed to swim in the lake.’ (MA)

As sketched in Chapter 2 in Section 2.2, the root modal *gidir* does not reveal any kind of ambiguity with the perfective, as shown in (4). The sentence refers to a past episode. For instance, the weather was very nice, and Ahmad successfully managed to swim in the lake last weekend. The root modal *gidir* entails that an agent ‘managed to’ do a specific event or activity that successfully happened, and it is impossible to cancel the state of affairs after it has taken place in the past.

With the imperfective, on the other hand, the root modal \gdr\ is ambiguous between a present ability reading associated with a specific situation and a more broadly generic one, as in (5).

- (5) ʔahmad yi-gdar yi-sbafi fi l-bufiayrah.
Ahmad 3.SG.M-ABLE.IMPFV. 3.M.-swim prep. the-lake
‘Ahmad is able to swim in the lake.’ (MA)

Second, the ‘managed to’ reading is not available with the epistemic modal *qad*, but it is available with *gidir*. In addition, the root modal \gdr\ has multiple flavours, such as a ‘permission reading’ with the imperfective as well as the perfective. Imagine a scenario where Ahmad has a math assignment, and also insists on playing PlayStation online with his friends. His mother does not allow him to play before completing his math homework,

and after he is finished, she says.

- (6) ti-gdar ti-lʔab bi-playstation.
 you.SG-ABLE.IMPFV. you.SG-play prep.-PlayStation
 ‘You may play PlaysStation.’ (MA)

The above example illustrates an important difference between the modals: $\backslash gdr \backslash$ is a verb modal, while *qad* is a semi-modal (recall Chapter 1).

Given the above examples, $\backslash gdr \backslash$ has a different scope position from *qad*. The root verbal modal $\backslash gdr \backslash$ is structurally located under the aspectual head (the perfective), as shown (7), unlike the semi-modal *qad* in (8).

- (7) $[_{TP} \text{ Past } [_{AspP} \text{ PFV. } [_{ModalP}(\text{root}) \text{ } gidir \text{ } [_{VP}]]]]$

- (8) $[_{ModalP} \text{ } qad \text{ } [_{TP} \text{ Past } [_{AspP} \text{ PFV. } [_{VP}]]]]$

The MA modal *qad* scopes over aspect. This scope position is analogous to the epistemic modal position that Cinque (1999) and Hacquard (2006; 2009) discuss. Epistemic modals always occupy a higher position with respect to aspect phrase in the derivation. However, even though the MA modal *qad* scopes over the perfective, AEs are generated, as illustrated in (2).

Further illustrated in the examples below, the MA modal *qad* is free from all aspectual morphology with both the perfective and the imperfective. It is the VP complement that bears aspectual markings, as in (9) and (10).

- (9) ʕomar qad yi-sgie z-zarʕ.
 Omar qad 3.SG.M.-water.IMPFV. the-plants
 ‘Omar might be watering the plants.’ (MA)

- (10) ʕomar qad sagaa z-zarʕ.
 Omar qad water.3.SG.M.PFV. the-plants
 ‘Omar already watered the plants.’ (MA)

These differences between the two modals show that they cannot be treated with a unified analysis for invoking AEs with the perfective. I will propose that *qad* illustrates a second path to AEs.

Given the novelty of the modal *qad* with the perfective, my ultimate goals in this Chapter are both descriptive and theoretical. I will describe MA data regarding the sensitivity between the MA modal *qad* and different types of aspectual complements. My theoretical proposal builds on Kratzer's (2012) discussion of the idea that some languages do not have a lexical distinction between a necessity modal and a possibility modal. She proposes that an additional ordering source narrows the domain of the set of possible worlds. My own proposal for *qad* relies on a manipulation of the ordering source.

Chapter 4 is organized as follows. I introduce the puzzle in Section 4.2. The puzzle will illustrate the modal *qad*'s interaction with aspect in MA. The research questions as well as key examples are presented in this section. I present earlier discussions of the interpretation of *qad* in Section 4.3. The same section includes a description of the modal *qad*'s association with perfective and imperfective aspect. I relate *qad* to previous proposals on AEs in Section 4.4. I formulate two hypotheses with respect to the epistemic modal *qad* with the perfective in Section 4.5. At the end of Chapter 4, I evaluate each hypothesis on the basis of the semantic behaviour of the modal *qad* with the perfective in Section 4.5.3.

4.2 The puzzle

In this Chapter, I explore a formal semantic account for the modal *qad* with the perfective, which is a novel phenomenon in the literature on modality in association with the perfective. This type of association invokes AEs, like the root modal *\gdr* (as discussed in detail in Chapters 2). I also aim to refine the claim about AEs being restricted to

root modals and being blocked with epistemic modals as pointed out by Hacquard (2006, 2009, 2014) and Portner (2009).

In this section, I present the empirical puzzle surrounding the modal *qad* with the perfective, which triggers AEs. My investigation of MA data reveals that *qad* obtains various semantic flavours relative to the aspect of its VP complements. This can be achieved by testing the intuitions acquired with each type of aspect. In what follows, I discuss interpretations obtained with the imperfective, and later on I introduce those obtained with the perfective.

Imagine a scenario where Muna is sitting in her room. Her father is wondering about what she is doing right now, so he asks Muna’s mom the following: “what is Muna doing in her room now?” Her mom is not sure about what Muna is doing at this moment, but she might be cleaning or tidying up her room, as shown in (11).

- (11) Muna qad ti-naððif yurfat-ha.
 Muna qad 3.SG.F.-clean.IMPFV. room-her
 ‘Muna might be cleaning her room(, but I am not sure that she is doing it now).’
 (MA)

The intuition behind example (11) is the following. It is possible that no cleaning has been completed by Muna with an imperfective VP complement; in fact the event may not even have started. It is possible to continue the above statement by saying “but she might not be cleaning her room” or “I am not sure that she will do it”, as illustrated in (12).

- (12) Muna qad tinaððif yurfat-ha, ?aw qad ma
 Muna qad 3.SG.F.-clean.IMPFV. room-her, or qad not
 tinaððif-ha.
 3.SG.F.-clean.IMPFV.-it
 ‘Muna might be cleaning her room, or she might not be cleaning her room.’ (MA)

Note that this scenario can be shifted to the future. Imagine another possible scenario where the father is planning to pay a visit to his parents tomorrow, on Sunday. He wants to take Muna with him. Based on Muna's routine on Sunday, her mom thinks that Muna might possibly be busy tidying up or cleaning her room. The mother is not sure what Muna will do tomorrow, as in (13). This scenario allows us to see that the embedded imperfective can be shifted towards the future in the scope of *qad*. The sentence reports that it is epistemically possible that Muna be cleaning her room tomorrow.

- (13) Muna qad ti-naððif yurfat-ha bukraḥ.
 Muna qad 3.SG.F.-clean.IMPFV. room-her tomorrow
 'Muna might be cleaning her room tomorrow, (but I am not sure that she will do it tomorrow).' (MA)

In both scenarios, there is an epistemic possibility that she *cleans* or *tidies up* her room, but it is not necessarily the case. Hence, imperfective VP complement of the modal *qad* is not actualized, and does not trigger AEs. However, when the modal *qad* is removed from example (11), the 'possibility' intuition that we previously obtain from (11) is no longer available, as shown in (14).

- (14) Muna ti-naððif yurfat-ha.
 Muna 3.SG.F.-clean.IMPFV. room-her
 'Muna cleans/is cleaning her room, (#but I am not sure)' (MA)

Without *qad*, the "possibility" interpretation disappeared and the imperfective sentence becomes ambiguous (as we have seen before). For the first reading, the speaker may refer to a habitual event of Muna's cleaning her room every week, as in (15).

- (15) Muna ti-naððif yurfat-ha kul ʔusbouʔ.
 Muna 3.SG.F.-clean.IMPFV. room-her every week
 'Muna cleans her room every week.' (MA: Habitual Reading)

For the second reading, the speaker is talking about an event that is taking place at the

moment of speech, which is equivalent to the present progressive reading, as shown in (16). In both cases, an adverb of time can help to clarify the type of reading that is acquired from the sentence.

- (16) Muna ti-naððif yurfat-ha dafeen.
 Muna 3.SG.F.-clean.IMPFV. room-her right.now
 ‘Muna is cleaning her room right now.’ (MA: Progressive Reading)

An epistemic possibility interpretation is straightforwardly visible when the modal *qad* is present and followed by an imperfective VP complement, as illustrated in (11).² Based on example (11), I will call the modal *qad* an ‘epistemic modal’. I will examine various examples in the sections that follow. The example below illustrates that the MA modal *qad* invokes epistemic possibilities.

Imagine a scenario where there are two art shows; both take place on July 1st. The first one in London and the second one is in Paris. Fatimah loves art, and it is possible she travelled to one of these art shows. The speaker is not sure about where Fatimah is, as illustrated in (17).

- (17) Fatimah qad tikuun bi-London dafeen, ?aw qad
 Fatimah qad 3.SG.F.be.IMPFV. in-London right.now, or qad
 tikuun bi-barees dafeen.
 3.SG.F.be.IMPFV. in-Paris right.now
 ‘Fatimah might be in London right now, or she might be in Paris right now, (but I am not sure).’ (MA)

It is important to clarify that in examples like (11), the availability of a future-shift depends on *qad*. It is not freely available to imperfective aspect, as in (18).

²As described in Section 1.2.4 in Chapter 1, there is the MA modal \mkn\ ‘may’ that has an epistemic reading. Unlike *qad*, this semi-modal does not invoke AEs with the perfective. The semi-modal \mkn\ can appear under the scope of the auxiliary *kaan*. The semi-modal \mkn\ is presumably located over the aspectual head in line with consensus regarding the relative structural height between epistemic modals and aspect. Further research is needed to explain this phenomenon.

- (18) Muna ti-naððif yurfat-ha (#bukrah).
 Muna 3.SG.F.-clean.IMPFV. room-her (#tomorrow)
 ‘Muna cleans her room (#tomorrow).’ (MA)

In (18), we find ambiguity between the habitual reading and the present progressive. This does not include a future interpretation or any other ambiguity. In MA, if the speaker wants to refer to a future event, a prefix *fi-* has to be affixed to the verb *ti-naððif*, as demonstrated in (19).

- (19) Muna fia-ti-naððif yurfat-ha bukrah.
 Muna Fut.-3.SG.F.-clean.IMPFV. room-her tomorrow
 ‘Muna will clean her room tomorrow.’ (MA)

Once the modal *qad* precedes an imperfective VP complement as in (11) (and as repeated for convenience in (20)), an uncertainty reading is available which allows the cleaning of the room to be in the future.

- (20) Muna qad ti-naððif yurfat-ha bukrah.
 Muna qad 3.SG.F.-clean.IMPFV. room-her tomorrow
 ‘Muna might be cleaning her room tomorrow, (but I am not sure).’ (MA)

Note that *qad* is not compatible with the prefix *fi-*, as shown in (21).

- (21) #Muna qad fia-ti-naððif yurfat-ha.
 Muna qad Fut.-3.SG.F.-clean.IMPFV. room-her

Perfective aspect is the second type of aspect that the modal *qad* can appear with. In this case, it gives rise to AEs. This is the main puzzle that I intend to account for in this Chapter. With perfective VP complements, *qad* may have two interpretations. The first interpretation indicates that Muna has completely finished cleaning her room. I call this reading an ‘already reading’, as in (22). It seems to be an aspectual reading.

- (22) Muna qad naððaf-at yurfat-ha.
 Muna qad clean.PFV.-3.SG.F. room-her
 ‘Muna already cleaned her room, (#but she didn’t finish).’ (MA)

Importantly, it is not felicitous to continue the sentence with negation by saying “but she didn’t finish”. It is also infelicitous to say “but I am not sure”, which is possible in (11).

It is also crucial to examine the intuitions of example (22) where *qad* is removed, in the same manner as was done with the imperfective examples.

- (23) Muna naððaf-at yurfat-ha.
 Muna clean.PFV.-3.SG.F. room-her
 ‘Muna cleaned her room, (but she didn’t finish).’ (MA)

In (23), there is a reference to a past episode. However, it is not completely obvious whether the event of *cleaning* is completed by Muna, in contrast to (22). Examples like (23) can be continued with “but I am not sure she finished cleaning her room”.

Here is another example of the already reading of the modal *qad*. Imagine a scenario where John calls home and his daughter answers the phone. He asks his daughter if he can get *Shawerma* for dinner, and the daughter replies by saying the following statement in (24).

- (24) Mom qad ʔabax-at pasta.
 Mom qad cook.PFV.-3.SG.F. pasta
 ‘Mom already cooked pasta, (#but she didn’t cook or didn’t finish cooking pasta).’ (MA)

In (24), it is infelicitous if the daughter continues with “but she didn’t cook it” or “but she didn’t finish cooking”. By adding the modal *qad*, the speaker points to the completion or actualization of the event.

The second interpretation seems to reflect a high degree of epistemic certainty. I call this an ‘indeed reading’. It seems to be a modal reading. The ‘indeed reading’ is the reading that I intend to explain in this Chapter. For this reading, imagine a scenario where Muna has pulled down the fire alarm on purpose at her school. The principal has

(25) Muna qad safiab-at ğihaaz l-ʔinθaar.
Muna qad pull.down.PFV.-3.SG.F. device the-fire.alarm
'Muna indeed pulled down the fire alarm, (#but she didn't).' (MA)

(26) Muna qad jaaf-at θuŋbaan fi l-fiadeegah.
Muna qad see.PFV.-3.SG.F. snake in the-garden
'Muna indeed (#already) saw a snake in the garden, (#but she didn't see one).'

(MA)

Given the description of the MA core data about *qad* relative to types of aspects, I aim to answer the following questions.

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To make the following discussion easier to follow, here is a preview. I explore two analyses to account for the modal *qad* with perfective aspect in MA. The first analysis is built on Kratzer's (1981; 1991; 2012) modal theory where manipulation of the ordering source can contribute to the interpretation of the modal, as I illustrate in Section 4.5.1. In some languages, the distinction between the possibility modal and the necessity modal collapses, a phenomenon Kratzer (2012) refers to as 'Modals Without Duals'. She uses the technique of manipulating the ordering source, which is a domain of restrictions for the set of accessible worlds, to derive the right interpretation for this new type of modal.

The second analysis is designed on the basis of Homer's (2011a) work on 'aspectual coercion' by the use of an 'actuality entailments operator' (ACT) in French, as in Section 4.5.2.³ Under the second hypothesis, I propose that an ACT operator merges between the VP complement and the perfective to trigger AEs. At the end of Chapter 4, I evaluate each analysis.

4.3 The modal *qad*

In this section, I provide some background regarding *qad* in light of the traditions of both Classical Arabic grammarians and modern linguists. I initially illustrate the intuitions behind *qad* as cited in the literature in Section 4.3.1. Furthermore, I offer detailed interpretations with respect to its association with the imperfective, as in Section 4.3.2, and the perfective, in Section 4.3.3, VP complements supported by real-life scenarios. These interpretations are crucial for the theoretical analysis proposed in Section 4.5.

4.3.1 What is *qad*?

This section focuses on the way Arab grammarians describe epistemic *qad*. They acknowledged the effect of the different aspects on the interpretations of *qad*.

³Recall Homer's proposal for AEs discussed in Chapter 2.

In Classical Arabic grammar, *qad* is descriptively treated as a particle that freely joins with perfective and imperfective VP complements.⁴ However, each type of aspect entails a distinctive interpretation (Al-Ansaarie, 1964; Al-Muradi, 1992; Al-Kuwarie, 2009; Wright and Caspari, 1964).⁵

Let us see in details how each type of aspect interacts with *qad*.

When the modal *qad* is associated with an imperfective VP complement, it signals that an event is epistemically possible. For instance, imagine that Omar is always busy, but he has agreed to do some chores. It is quite possible that he will water the plants, as presented in (29).

In (29), the event of watering the plants has not yet started, nor is it occurring during the speech time. Importantly, the speaker is uncertain whether the event will take place at all, so the speaker is not certain about the completion of the event. It is felicitous to continue with “but I am not sure” with the imperfective complements.

⁵Al-Ansaarie (1964); Al-Muradi (1992) are eminent Arabic grammarians. Al-Muradi's and Al-Ansaarie manuscripts remain enormously influential in Arabic grammar, specifically on the topic of Arabic particles. The former grammarian died in 749 A.H. / 1348 A.D., and the latter died in 761 A.H/ 1360 A.D. Their manuscripts became available to researchers in the nineteenth century.

(30) ʔomar yi-sgie z-zarʔ.
Omar 3.SG.M.-water.IMPFV. the-plants
'Omar waters/is watering the plants, (#but I am not sure).'

(MA)

(31) Omar waters the plants every day/every week. (Habitual Reading)

(32) ʔayʃ ʕomar (bi-)yi-sawie?
 what Omar (is-)3.SG.M.-do.IMPV.
 ‘What is Omar doing?’ (MA)

Imagine another scenario in which we are close to the summer vacation, and Muna likes to plan for her vacation ahead of time. Muna's neighbour is wondering about Muna's plan, and asks:

(34) What is Muna doing over the summer?

Muna's roommate answers the above question as in (35).

(35) Muna qad ti-saafir li-l-Yunaan.
Muna qad 3.SG.F.-travel.IMPFV. to-the-Greece
'Muna might be travelling to Greece, (but I am not sure if she will).' (MA)

As soon as the modal *qad* is removed from the sentence, the uncertainty reading disappears. The intuitions of the sentence shift to a habitual reading (every summer) or a progressive reading (right now), as in (36).

(36) Muna ti-saafir li-l-Yunaan (kul sayf) (dafeen).
Muna 3.SG.F.-travel.IMPFV. to-the-Greece (kul summer) (right.now)
'Muna travels/is travelling to Greece (every summer) (right now), (#but I am not sure).' (MA)

Note that neither *qad*-free Example (30) nor (36) is felicitous with this continuation "but I am not sure".

To conclude, I have demonstrated intuitions where epistemic *qad* is linked with an imperfective complement. In the following discussion, I present the readings of *qad* with the perfective.

4.3.3 *qad* + the perfective

This section highlights the various readings of *qad* that are obtained with perfective VP complements. Both Arab linguists and Arabic grammarians acknowledge the way *qad* interacts with the perfective (Al-Ansaarie, 1964; Al-Muradi, 1992; Al-Kuwarie, 2009; Wright and Caspari, 1964; Fassi Fehri, 2012; Bahloul, 2008, 2016). They classify *qad* as either a 'temporal marker' (*just*) in (37), an 'aspectual marker' (*already/ completely*) in (38), or an 'emphatic particle' (*indeed*) in (39) (Bahloul (2008)).

- (37) Qad ?ataa ?amsi.
 qad came yesterday
 qad come.PFV.3.SG.M. yesterday⁶
 ‘He did come yesterday/ He just (#already) came.’ (Fassi Fehri, 2012, p.8)
- (38) ?l-?wlaad qad katabuu l-waajib.
 the-boys qad write.PFV.3.PL.M. the-homework
 ‘The boys already wrote the homework.’ (MA)
- (39) Qad kaan y-uSallii.
 qad was 3-pray
 qad be.3.SG.M. 3.SG.M.-pray.PFV.
 ‘He was indeed praying.’ (Fassi Fehri, 2012, p.8)

Wright and Caspari (1964) provides a useful description of *qad*, meant for non-Arabic speakers, as shown in (40).⁷

- (40) The perfect is often preceded by the particle *qad*..... its completeness may consist either (a) in the removal of all doubt regarding it, in its perfect certainty as opposed to uncertainty; or (b) in its having taken place in agreement or disagreement with what preceded it.

(Wright and Caspari, 1964, p.3)

Examples like the above are cited in most Arab linguists’ works. Unfortunately, they are presented without scenarios to explain the flavours of the modal *qad*. My task is to describe real-life scenarios to clarify the interpretations of the modal *qad* in the following discussion.

To determine when the modal *qad* has the ‘already’ versus the ‘indeed reading’, I

⁶A reminder for the reader that all of Fassi Fehri’s examples are re-glossed to maintain consistency across all examples in the paper.

⁷However, Wright has a different description of the Arabic aspectual system. He refers to completed and finished acts as ‘perfect’ rather than ‘perfective’, which I use in this Chapter.

examine verbs inside *qad*'s VP complement. I adopt Vendler's (1976) verb classes: state, activity, achievement and accomplishment verbs. My main goal is to find out the types of verbs that favours for the 'already reading' and the 'indeed reading'. I also support my examples with scenarios that naturally reflect each type of reading.

I start with stative verbs such as "know". Imagine a scenario where Nova planned to hang out with her friends on Saturday. She promised her parents to be at home no later than 8 p.m. It is 9 p.m. now, and Nova is still out. Nova's parents are worried and angry at the same time, because she was committed to her promise. Nova called her dad and explained that she did not realize it was 9 p.m. Her dad was very upset that she did not show any responsibility. Her mother was not around during this conversation, and she tries to give Nova a call. Nova's dad says that there is no need to give her a call as he has *already* given Nova a hard lesson over the phone, and he says the following in (41).

- (41) Nova *qad* *ʕirf-at* *xaTaʔ-ha*.
 Nova *qad* know.PFV.-3.SG.F. mistake-her
 'Nova already (#indeed) knew her mistake, (#but she didn't).' (MA)

The fact that in this scenario the modal *qad* is understood as 'already' can be made clear by observing that it is possible to replace the modal *qad* with an adverb that specifically means 'already' *xalaş*, and the meaning remains unchanged.

- (42) Nova *xalaş* *ʕirf-at* *xaTaʔ-ha*.
 Nova *xalaş* know.PFV.-3.SG.F. mistake-her
 'Nova already knew her mistake, (#but she didn't).' (MA)

For the activity verbs, I use the verb "cooking" again. (I repeat the same example as earlier for convenience.) For instance, there is a scenario where John calls home and his daughter answers the phone. He asks his daughter if he can get *Shawerma* for dinner, and the daughter replies by saying the following in (43).

- (43) Mom qad ṭabax-at pasta.
 Mom qad cook.PFV.-3.SG.F. pasta
 ‘Mom already(#indeed) cooked pasta, (# but she didn’t cook or didn’t finish cooking pasta).’ (MA)

In (43), the speaker gives reference to the completion or to the actualization of the event by the use of the modal *qad*. Like the stative verbs, activity verbs also prefer the ‘already reading’ to refer to completion of the action.

Similarly to what we have seen before, an alternative version of (42) is with the use of the adverb *xalaaş*, shown in (44).

- (44) Mom xalaaş ṭabax-at pasta.
 Mom already cook.PFV.-3.SG.F. pasta
 ‘Mom already cooked pasta, (#but she didn’t cook or didn’t finish cooking pasta).’ (MA)

With respect to achievements, like “win a prize” or “reach the top”, my example shows that verb “win” is compatible with the ‘indeed reading’ but not with the ‘already reading’, as in (45). Suppose that Nova and Susan are talking about the number of Grammy Awards that Lady Gaga won in 2011. Nova says that Lady Gaga won three Grammy Awards in 2011 for the best Pop vocal album, best female Pop vocal and best short form music video. Susan is skeptical about the number of the awards given to Lady Gaga, but Nova is very sure about her claim.

- (45) Lady Gaga qad faaza-at bi-θalaaθ-a ʒwaayz Grammy fi
 Lady Gaga qad win.PFV.-3.SG.F. prep-three-3.SG.F. awards.PL.F. Grammy in
 ʕaam 2011.
 year 2011
 ‘Lady Gaga indeed (#already) won three Grammy Awards in 2011, (#but she didn’t).’ (MA)

Now, I examine removing the modal *qad* from Example (45), but I want to maintain the

‘indeed reading’ in my toy example. The adverb *bilfiil* “indeed” is added, and it invokes the ‘indeed reading’ not the ‘already reading’, as described in (46).

- (46) Lady Gaga bilfiil faaza-at bi-θalaaθ-a ʒwaayz Grammy
 Lady Gaga indeed win.PFV.-3.SG.F. prep-three-3.SG.F. awards.PL.F. Grammy
 fi ʕaam 2011.
 in year 2011
 ‘Lady Gaga indeed won three Grammy Awards in 2011, (#but she didn’t).’

(MA)

Later, Susan asks how Nova knows this. Nova bases her claim on what was reported on Fox News and Wikipedia. Achievements verbs are thus associated with the ‘indeed reading’ of the modal *qad*.

Finally, accomplishments such as “running a mile” or “drawing a circle” also seem to appear with the indeed reading. For example, there is a scenario where John and Nova are talking about Susan’s running skills and the way she maintains a healthy lifestyle. John says that Susan ran a mile last month when they ran together. Nova could not believe him at first, but he indicates that he is sure of his claim by saying the following in (47).

- (47) Susan qad ʒery-at meel.
 Susan qad run.PFV.-3.SG.F. mile
 ‘Susan indeed ran a mile, (#but she didn’t).’

(MA)

To sum up, I demonstrated empirical data where *qad* can be associated with both imperfective and perfective VP complements. As presented in this Section, the association with perfective VP complements always yields AEs. Also, I find Vendler’s verb classification is very helpful in determining the flavours that the modal *qad* can obtain. Both stative and activity verbs select the aspectual ‘already reading’. Like achievement verbs, accomplishment verbs seem to favour the ‘indeed reading’ of the modal *qad* over the ‘already reading’.

Having illustrated the ‘indeed reading’ of the modal *qad* with the perfective, I refer back to the Classical Arabic Grammarians, Sybawayh in Al-Muradi (1992). Sybawayh points out a very interesting fact about the ‘indeed reading’, and he considers it as an answer to the following kind of question in (48). As you can see, all of the above examples where the ‘indeed reading’ is invoked are answers to the same question in (49).

(48) Did *x* do it?

Al-Muradi (1992) helpfully comments on the ‘indeed reading’ by saying that *qad* is a particle that invokes reporting news or information. For instance:

(49) kaaʔin-aat faDaaʔ-y-ah qad ʔahar-at fi New Jersey.
 creature-3.PL.F. space-adj-3.SG.F. qad appear.PFV.-3.SG.F. in New Jersey
 ‘Flying saucers indeed (#completely/#already) appeared in NJ.’ (MA)

The use of the modal *qad* brings about a sort of high certainty due to available facts and evidence. The speaker is reporting news that he read in the newspaper or watched on TV. When the speaker narrates or reports the news, the listener is expected to ask the following question: “how did you learn this?”

Al-Muradi (1992) and Al-Ansaarie (1964) among others pointed out that *qad* with the imperfective yields the speaker’s expectations that something may happen in the present time or the future. It is impossible to have these expectations with the perfective, in which events already happened in the past. They are immune to cancellation. Al-Muradi (1992) and Al-Ansaarie (1964) assume that a listener is waiting for news to confirm that the event had indeed happened. Hence, the modal *qad* is called *fiarf ʔixbaar* a ‘reporting particle’, as in (51).

(50) What happened?

- (51) *qad qaam-at* *ʔa-SSalah.*
 qad start.PFV.-it.F. the-prayer
 ‘The prayer indeed started.’ (Al-Ansaarie, 1964, p.228)

Al-Ansari does not explain the intuitions for *qad* here. I provide a plausible scenario to illustrate the intuitions here. Suppose that Nova visits Saudi Arabia. Based on Saudi regulations, stores have to be closed during the prayer times, which Nova is ignorant about. It is the afternoon prayer, and all stores are closing, so Nova asks the following question: “what happened?” Nora answers the question as given in (51).

To sum up, I have demonstrated the empirical data where *qad* can be associated with imperfective and perfective complements. The association with perfective complements always yields AEs. We have also seen that the combination of *qad* and a perfective complement gives rise to either the ‘already reading’ or the ‘indeed reading’; such readings are determined by context and Vendler’s classes.

In what follows, I refer to previous studies on AEs, which are the results of the interaction between the root modals and the perfective. (I have offered a detailed discussion about the semantic consequences of associating the root modal with the perfective in Section 2.2 and Section 2.5 in Chapter 2 of this dissertation.).

As stated in Chapter 2, the starting point in the literature of modality and aspects is first attributed to Bhatt’s (1999; 2006) discovery of the presence of AEs with root modal with the perfective in Hindi-Urdu. Afterwards, semanticists offered various formal approaches to account for AEs with the root modals, such as Piñón (2003), Hacquard (2006, 2009, 2014); a.o. I will not repeat the presentation of these works in Chapter 4, but the reader may refer to Chapter 2 for a more comprehensive discussion. In Section 4.4, I focus on two well-known works on AEs, and they are Bhatt’s (1999; 2006) generalization and Hacquard’s (2006; 2009; 2014) proposal. I will compare their analyses of root modals

relative to the perfective with the modal *qad* in association with the perfective.

My observation of *qad* with perfective aspect shows that AEs are generated even though the perfective is under the scope of the modal *qad*. Therefore, I argue that the modal *qad* cannot receive an analogous analysis as the root modal $\backslash gdr \backslash$. This argument is built on facts relative to the semantic behaviour of *qad* with the perfective, which I explain in Section 4.3.3.

Accordingly, I propose a lexical entry for the modal *qad* building on Kratzer's (1981; 1991; 2012) well-known proposal on modality in Section 4.5. I show that the proposed lexical entry of *qad* can occur with both the imperfective and the perfective. Therefore, the modal component of *qad* is maintainable with both types of aspect. With the imperfective, a 'possibility flavour' is always obtained, while the 'indeed reading' is anchored with the perfective. This important finding leads into a new proposal to account for generating AEs with epistemic modals and perfective aspect. The 'already reading' remains for future research.

To do so, I consider two hypotheses for computing AEs in the context of the epistemic modal *qad* with the perfective in Section 4.5.1 and Section 4.5.2. Finally, I conclude the discussion by evaluating the two hypotheses in Section 4.5.3. I show which hypothesis is more feasible to account for the MA modal *qad* with the perfective.

4.4 Revisiting AEs

As described in Section 4.3.2 and Section 4.3.3, the modal *qad* receives an epistemic possibility interpretation with the imperfective, but an (aspectual) 'already reading' or an (epistemic) 'indeed reading' with the perfective. The association of the modal *qad* with the perfective gives rise to AEs.

In this section, I present my evaluation of the previous proposals on the sensitivity

reported between root modals and the perfective with respect to the modal *qad*. Recall that I have thoroughly discussed these previous proposals in Chapter 2 in Section 2.3 of this dissertation. For simplicity, I will focus on two well-known proposals in the association between root modals and perfective aspect by Bhatt (1999, 2006) and Hacquard (2006, 2009) in this section.

In the literature of the interaction between the root modals and perfective aspect, there is a common belief that the epistemic modals are excluded from this type of interaction by (Hacquard, 2006, 2009), and later by Portner (2009), and Kratzer (2012). Accordingly, AEs are only generated when the root modals and the perfective are combined, but AEs are absent with the epistemic modals.

This consensus needs to be revisited in languages other than Hindi-Urdu, as in Bhatt (1999, 2006), and French, as in Hacquard (2006, 2009). As sketched earlier in Section 4.3.3, the modal *qad* with the perfective always yields AEs in MA. This fact surrounding AEs represents a cross-linguistic phenomenon, which is worth investigating in formal semantics. It does not seem possible to treat all three languages under a unified proposal, as designed by Hacquard (2006, 2009). My observation of these proposals with respect to the MA data of *qad* shows the following challenges.

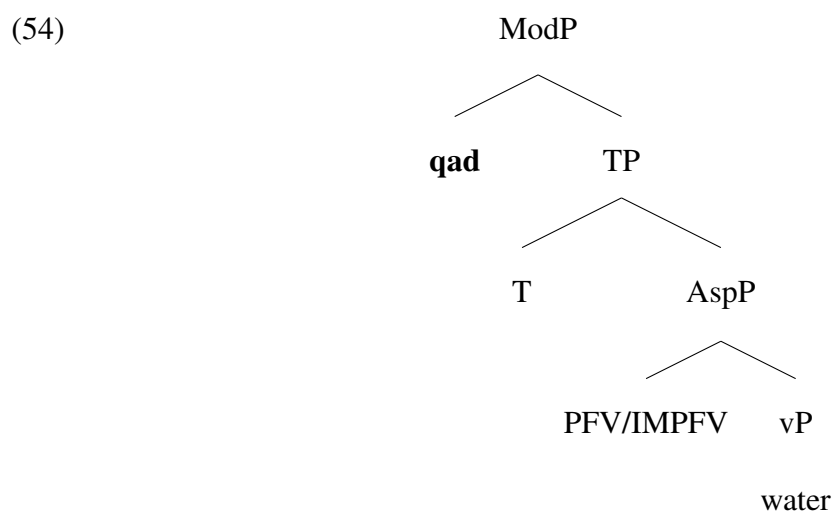
First, the modal *qad* always entails assertion of completing the events and a high degree of certainty with the perfective. As we have seen in Section 4.3.3, with the perfective the modal *qad* may refer to either the (aspectual) ‘already reading’ or the (epistemic) ‘indeed reading’, depending on the verb inside the VP complement. For convenience, I repeat some of these examples below in (52) and (53).

- (52) Nova *qad* *ʕirf-at* xaTaʔ-ha.
 Nova *qad* find.out.PFV.-3.SG.F. mistake-her
 ‘Nova already (#indeed) found out her mistake, (#but she didn’t).’ (MA)

- (53) Lady Gaga qad faaza-at bi-θalaaθ-a ʒwaayz Grammy fi
 Lady Gaga qad win.PFV.-3.SG.F. prep-three-3.SG.F. awards.PL.F. Grammy in
 ʕaam 2011.
 year 2011
 ‘Lady Gaga indeed (#already) won three Grammy Awards in 2011, (# but she
 didn’t).’ (MA)

In (52) and (53), the modal *qad* does not have a ‘managed to reading’ with the perfective. The intuition of the modal *qad* with the perfective does not entail that there is an effort by an agent. Rather the events of “finding out her mistake” and “winning the awards” simply happen in the past time, and it is infelicitous to cancel them.

Second, the modal *qad* is free from any aspect markers. The VP complement is the only element that is inflected, which entails something about the position of aspect in the case of the modal. If only the VP complement is inflected with aspectual morphology, then I predict that aspect is below the epistemic modal *qad*, as in (54).



In the structure (54), I assume a single position where *qad* is located relative to both imperfective aspect and perfective aspect. The modal *qad* occupies the same high position as epistemic modals. As a result, the modal *qad* presumably scopes over aspect phrase. Based on the structure in (54), AEs are derived even though perfective aspect is located below *qad*.

Third, the modal *qad* and the French and Italian root modals do not share the same background, or modal base. The modal base of the MA modal *qad* is based on the speaker's knowledge relative to the available pieces of evidence to support his claim. Hacquard's French and Italian modals do not depend on the speaker's background information but rather on circumstances. Hence, I think the divergence in the type of the modal base requires a different formal account for the modal *qad*.

Fourth, a final challenge relies on *qad*'s intuitions with the imperfective. *Qad* always has the epistemic possibility interpretation with the imperfective marker on the VP complement. In Hacquard's root modal data, the root modal with the imperfective does not refer to any epistemic possibility interpretations, unlike with the MA modal *qad*.

Given the above challenges of Bhatt's and Hacquard's proposals relative to my *qad* data, I consider two hypotheses to resolve the theoretical puzzle surrounding the modal *qad*, which the following section focuses on.

4.5 On the association between *qad* and aspect

In this section, I aim to formally account for the interaction between *qad* and the perfective, which gives rise to AEs. My focus with the perfective will be on the (epistemic) 'indeed reading'.⁸ The result of this interaction is considered a novel phenomenon in the theory of modality and aspect. My proposal could help us to solve the empirical and theoretical puzzle of *qad* with the perfective, while maintaining a standardized semantics for aspects and modality.

Before I delve into my formal proposals for the computation of the modal *qad* with the perfective, I introduce the computation of the modal *qad* inspired by the Kratzerian modal proposal (Kratzer, 1981, 1991, 2012).

⁸A discussion of the aspectual reading must remain for future research.

In considering Kratzer's modal proposal, two sets of parameters are required. (I have elucidated Kratzer's system in Section 1.3.3 in Chapter 1 of this dissertation.) In Kratzer's epistemic modal machinery, one conversational background is related to the speaker's knowledge and beliefs, whereas the other one corresponds to expectations. Let us reconsider an MA example with *qad* to recognize the epistemic knowledge in (55).

- (55) ʔomar qad yi-naθθif yurfat-u.
 Omar qad 3.SG.M.-clean.IMPFV. room-his
 'Omar might be cleaning his room, (but he might not do so).'
- (MA)

The first ingredient defines the type of conversational background here. When a proposition like *Omar cleans his room* is joined with the modal *qad*, the interpretation of the sentence is based on the speaker's belief or evidence. Importantly, the type of evidence in our case is not explicitly defined. It mainly depends on the speaker's knowledge. This is what Kratzer calls the 'epistemic conversational background', as defined in (56).

- (56) An epistemic conversational background is a function f which assigns sets of propositions to members of W such that for all $w \in W$: contains all those propositions which are established knowledge in w —for a group of people, a community, etc.

(Kratzer, 1981, p.45)

The above definition can be informally paraphrased as:

- (57) In view of what is known...
- (Kratzer, 1981, p.45)

The function f , which is the epistemic conversational background, is the first ingredient in the Kratzerian modal system. It is a parameter of interpretation that provides a first approximation to the set of the possible worlds to be quantified over.

Portner (2009) elaborates on the description of the function f where context c is in-

volved, for instance:

- (58) Used in context c , *what I know* expresses that function f such that: (i) The domain of f is that subset of W in which the speaker of c exists. (ii) For any w in the domain of f , $f(w) = \{p: \text{the speaker of } c \text{ knows } p \text{ in } w\}$ (Portner, 2009, p.51)

The function f maps the set of worlds onto a set of propositions that are epistemically accessible. The intersection of the propositions in that set gives us the set of possible worlds that are epistemically accessible. An example is shown below in (59).

- (59) If $f(w) = \{p_1, p_2, p_3, p_4\}$, then $\bigcap f(w) = \{p_1 \cap p_2 \cap p_3 \cap p_4 \dots\}$

So, $\bigcap f(w)$ in the set of possible worlds where all the propositions the speaker knows in w are true.

In Kratzer's proposal another parameter is required to rank those worlds. The second ingredient, a second parameter of interpretation, is an 'ordering source' g . The ordering source g selects the possible worlds provided by the modal base f , and then it ranks these worlds into the best world on the basis of a set of propositions (Kratzer, 1981, 1991, 2012; Portner, 2009); a.o. The strict ordering of the propositions is induced by $\leq_{g(w)}$, as in (60).

- (60) For any set of worlds X and a set of propositions P , define *the strict partial order* $\leq$ as follows: for all $w_1, w_2 \in X$, $w_1 \leq_{g(w)} w_2$ iff $\{p \in P: p(w_2) = 1\} \subset \{p \in P: p(w_1) = 1\}$

Having defined for epistemic possibility modals the modal base f and the ordering source g , the lexical entry for the modal *qad* will be:

- (61) $[[Qad]]^{f,g,w} = \lambda p. \exists w' \in \text{MAX}_{g(w)}: (\bigcap f(w): p(w') = 1)$

The above lexical entry will generate the following: 'There exists a world that is a member

of the $MAX_{g(w)}$ worlds that are epistemically accessible in which p is true. The function f assigns the possible worlds sets of propositions that are all known to be true. The function of MAX is to select the best worlds of the modal base in which a subset of the propositions of the ordering source hold. Afterwards, the modal quantifies over the most ideal worlds of the modal base.’

In this section, I have proposed a lexical entry of the modal *qad* as an epistemic modal in the spirit of Kratzer’s modal system. Notice that I have not incorporated the role of aspect on the interpretation of the modal. The following sections discuss formal discussion regarding the modal *qad* and its sensitivity with aspect—the imperfective and the perfective. I consider the two hypotheses for computing AEs, which are in light of Kratzer (2012) and Homer (2011a). The first analysis has a true epistemic possibility modal base (Kratzer, 1981, 1991, 2012) analogical to the English possibility modals *may* and *might*. The second analysis builds on the actuality operator (ACT) for ‘aspectual coercion’ as proposed by Homer (2011a). Finally, I work out an evaluation of the two hypotheses and select the one formal account that best captures the MA data.

4.5.1 Actuality via domain-manipulation

In this section, I examine the first hypothesis building on Kratzer’s (2012) recent modal proposal. As we have seen earlier in Section 4.3.3, the combination of *qad* with the perfective results in generating AEs, unlike the imperfective. I assume that the process of yielding AEs is analogous to a ‘narrow ordering source’ proposal by Kratzer (2012) to capture intuitions about strength of modals reported in some languages.

In Kratzer (2012), she claims that manipulation of the ordering source can have a corresponding effect on intuitions about quantificational strength (Kratzer, 1981, 1991, 2012; Davis et al., 2009; Portner, 2009; Peterson, 2008; Matthewson et al., 2007; Rull-

mann et al., 2008). In some languages there is no lexical distinction between possibility and necessity; the distinction between a possibility modal and a necessity one collapses. The technical term for such modals is ‘modals without duals’.

In language with ‘modals without duals’, the ordering source is also a domain of restriction for the set of possible worlds. The trick in Kratzer’s (2012) proposal is the following: the ordering source can be either broad or narrow. If the domain restriction is broad and includes all possible worlds that are epistemically accessible, the possibility modal becomes weaker than the true English possibility modal *may* and *might*. If the domain restriction is narrow, and it induces a “small” subset for the closets worlds to the ideal one, then the necessity modal becomes weaker and it behaves like a true possibility English modal.

One of the languages that has modals without duals is St’a’t’imcets (Lillooet Salish). In St’a’t’imcets, modals appear to have a strict conversational background allowing both possibility and necessity interpretations with “variable” quantificational force such as epistemic *k’a* (Rullmann et al., 2008). In other words, St’a’t’imcets does not appear to have a specified quantificational force, but rather the context seems to determine the modal’s quantificational force ranging from universal to existential. In specified contexts, the same modal clitic might be translated into English as *must/should*, and sometimes as *may, might* or *could*. Let us see the following examples, as illustrated by Rullmann et al. (2008).

- (62) ka-q’us-tum’-’a k’a wi7.
 OOO-frighten-PASS-OOO INFER EMPH
 ‘It really must have frightened him!’ (Matthewson, 2005, p.418)

In (62), there is a scenario where Jim Holffmann thought he saw a sasquatch and came

The following scenario in (63) is a background for Example (64), where the epistemic modal $k'a$ is used.

- In (64), the epistemic *k'a* has existential quantificational force with a epistemic conversational background, similar to English *may*, *might*, or *could*.

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of the best worlds. The necessity modal becomes weaker, so it behaves similar to a possibility modal. Kratzer (2012) illustrates the behaviour of such modals in these language as follows:

- (65) In an ordering semantics for modals, ordering sources are used as domain restrictions for the set of accessible worlds: not all, but only the “closest” of accessible worlds matter for what is possible or necessary. As the domain of accessible worlds shrinks, necessity modals become weaker and possibility modals become stronger. In some extreme cases, the distinction between necessity and possibility collapses. In the less extreme cases, necessity and possibility may still be formally distinguishable, but a language may nevertheless choose not to lexicalize dual pairs of modals in some or all modal domains.

(Kratzer, 2012, p.45)

Considering the above description, I aim to link the manipulation of the ordering source approach with the interaction between *qad* and aspect relative to the intuitions of the perfective and the imperfective. I predict that a narrow domain of the ordering source matches the intuitions for perfective aspect. On the other hand, a broad ordering source domain is coherent with the imperfective.

Let us apply Kratzer’s proposal for modals without duals to the examples with *qad*. I start with the analysis of *qad* with the imperfective example, and then with the perfective. In principle, I assume an implicit modal base that is determined by whatever the context provides. In the case of *qad*, the epistemic conversational background is based on what the speaker knows about the world.

Recall my toy example with the imperfective, which I repeat for convenience in (66).

- (66) Muna qad ti-naððif yurfat-ha.
 Muna qad 3.SG.F.-clean.IMPFV. room-her
 ‘Muna might be cleaning her room, (but she might not do so).’ (MA)

In (66), the modal *qad* obtains a possibility interpretation where it is possible for Muna to be cleaning her room. I will investigate the above example on the basis of the proposed lexical entry of the modal *qad*, repeated below in (67):

- (67) $[[Qad]]^{f,g,w} = \lambda p. \exists w' \in \text{MAX}_{g(w)}: (\bigcap f(w): p(w')=1)$

As explained earlier, the modal base f for *qad* will be the set propositions compatible with the speaker’s knowledge. The ordering source g will be the set of propositions corresponding to what the speaker considers to be normal or expected. This is sketched below in (68) and (69).

- (68) Modal base = $f(w) = \{p: \text{the speaker knows } p \text{ in } w\}$

- (69) Ordering source = $g(w) = \{p: \text{the speaker expects } p \text{ in } w\}$

I will briefly sketch the composition of the interpretation of example (66). (For simplicity, I have used an English VP.)

- (70) $[_{ModalPhrase} \text{ qad } [_{TP} \text{ Present } [_{AspectPhrase} \text{ IMPFV. } [_{VP} \text{ Muna cleans her room}]]]]$

I start with the computation of the VP complement, as shown in (71).

- (71) $[[\text{Muna cleans her bedroom}]]^{f,g,w} = \lambda e_\ell. \lambda w. \text{cleans her room}(e, \text{Muna}, w)$

The VP complement *Muna cleans her room* needs to combine with the imperfective, which has the lexical entry in (72) (see Chapter 1), with the result in (73) (in detail in (74)):

- (72) $[[\text{IMPFV.}]]^w = \lambda P_{\langle \ell \langle s,t \rangle \rangle}. \lambda t_i. \lambda w_s. \exists e_\ell (P(e)(w)=1 \wedge t \subseteq \text{time}(e))$

$$(73) \quad [[\text{IMPFV.}]]^w ([[\text{Muna cleans her room}]])^{w,B,\leq,c}$$

$$(74) \quad \lambda t_i. \lambda w_s. \exists e_\ell. (\text{cleans her room} (e. \text{Muna}, w) \wedge t \subseteq \text{time}(e))$$

When the aspectual phrase combines with the referential present tense, the result will be the proposition below in (75):

$$(75) \quad \lambda w_s. \exists e_\ell. (\text{cleans her room} (e. \text{Muna}, w) \wedge t \{t \approx t^*\} \subseteq \text{time}(e))$$

In (75), this is the proposition that is true in a world w iff there exists an event of Muna cleaning her room in w , and the run time of the event includes the speech time. This proposition will combine with the modal *qad*, as illustrated below.

$$(76) \quad [[\text{Qad}]]^{f,g,w} ([[\text{TP}]])^{f,g,w}$$

$$(77) \quad [[(66)]]^{f,g,w} = 1 \text{ iff } \exists w' \in \text{MAX}_{g(w)}: (\bigcap f(w): \exists e (\text{cleaning her room} (e, \text{Muna}, w') \wedge t \{t \approx t^*\} \subseteq \text{time}(e)))$$

The sentence (77) will be true iff there exists a world in the domain of quantification of the modal such that in that world there exists an event of Muna cleaning her room, and the run time of that event includes the speech time.

Having provided a discussion about the modal *qad* with the imperfective, I will discuss the composition of the modal *qad* with the perfective. I start by presenting the structural tree in (79) for Sentence (78):

$$(78) \quad \begin{array}{l} \text{Muna qad na}\theta\theta\text{afat} \quad \quad \text{yurfat-ha.} \\ \text{Muna qad clean.3.SG.F.PFV. room-her} \\ \text{'Muna indeed cleaned her room, (\#but she didn't).'} \end{array} \quad (\text{MA})$$

The predicted composition of Example (78) will be as follows:

$$(79) \quad [_{\text{ModalPhrase}} \text{Qad} [_{\text{TP}} \text{Past} [_{\text{AspectPhrase}} \text{PFV} [_{\text{VP}} \text{Muna cleaned her room}]]]]$$

I speculate that the modal *qad* maintains an epistemic modal base, but the ordering source *g* changes when embedded aspect is perfective. I construct my proposal based on the intuition that perfective aspect in examples like (78) signals that events have reached an endpoint in the past (e.g. Kratzer (1998); Klein (1994); Homer (2011a); Hacquard (2009, 2006); Comrie (1976); a.o.). As we have seen in Section 4.3.3, the ‘indeed reading’ of the modal *qad* is associated with the available evidence. My proposal is that when embedded aspect is perfective, the ordering source for the modal *qad* includes the proposition that is true in a world, if the evidence that is available in that world is also available in that evaluation world $w^@$. This means that the ordering source propositions will include the proposition below:

$$(80) \quad \{w: \text{all evidence available in } w \text{ matches all evidence available in } w^@ \}$$

The proposition in (80) will be true in $w^@$ and, moreover, it will arguably only be true in $w^@$. The actual world is the only world where all the evidence available in the actual world is indeed available.⁹ It is not possible for two different worlds to have exactly matching evidence, since there will be a difference in the events across worlds, and so there will automatically be a difference in the evidence across worlds. By including the proposition (80) in the ordering source $g(w^@)$, the domain of the epistemic possibility modal *qad* becomes very much narrowed down: it includes just one world (= $w^@$). This narrow ordering source makes necessity and possibility equivalent, and gives rise to AEs. I will sketch the derivation of the truth conditions for (78) below, including the denotation of perfective aspect as in Chapter 1:

$$(81) \quad [[\text{PFV}]]^{w^@} = \lambda P_{\langle \ell \langle s, t \rangle \rangle} . \lambda t_i . \lambda w_s . \exists e_\ell (P(e)(w) = 1 \wedge \text{time}(e) \subseteq t$$

⁹With the assumption that there is no other world that is identical to the actual world in terms of what happens.

$$(82) \quad [[Qad]]^{f,g,w@} ([[TP]])^{w@}$$

$$(83) \quad [[(78)]]^{f,g,w@}=1 \text{ iff } \exists w' \in \text{MAX}_{g(w@)}: (\bigcap f(w@): \exists e_\ell (\text{cleaning her room } (e, \text{Muna}, w') \wedge \text{time}(e) \subseteq t \{t < t^*\})$$

The truth conditions in (83) are derived by combining the perfective aspectual phrase with past and the modal *qad* (see (79)). The domain of quantification of the modal will consist only of the actual world ($w^@$):

$$(84) \quad [[(78)]]^{f,g,w@}=1 \text{ iff } \exists w' \in \{w^@\}: \exists e_\ell (\text{cleaning her room } (e, \text{Muna}, w') \wedge \text{time}(e) \subseteq t \{t < t^*\})$$

Even though there is existential quantification in the modal domain, the embedded proposition must be true in the actual world in order for the sentence to be true. This is the only world that is a member of the modal domain.

To summarize, I have discussed the first proposal that accounts for the sensitivity of the interpretation of the modal *qad* with types of aspect in MA. The modal *qad* has an epistemic modal base building on Kratzer's (1981; 1991) modal system, as shown in Section 4.4. Afterwards, I follow Kratzer's (2012) recent proposal of manipulation of the ordering source to account for 'modals without duals'.

Building on the modals without duals system, I argue that the domain restriction of the epistemic modal *qad* is broad with the imperfective. The domain restriction includes a proposition that is true in possible worlds that are close to the ideal world.

In the case of embedded perfective, my 'trick' is an extreme version of Kratzer's proposal: the ordering source identifies only the actual world. In my analysis, I incorporate aspects of Hacquard's (2006; 2009) proposal for the perfective with French root modals to invoke AEs by linking the perfective to the actual world. Following the proposal of

domain restriction by Kratzer (2012), I argue that the domain restriction of *qad* involves a proposition that is true in only one world, which is the actual world. This world is the only world where all the evidence available in the actual world is indeed available. I assume that there is no other world that is identical to the actual world $w^@$, regarding what happens. This assumption is based on the fact that it is impossible for two different worlds to have exactly matching evidence. As a result, the domain restriction of the epistemic modal *qad* is very narrow with the perfective. This narrow ordering source causes the distinction between the necessity and the possibility modals to collapse and leads to generating AEs with the perfective. At the moment, the link between the perfective and a very narrow ordering source remains a stipulation. The inspiration was provided by literature linking the “indeed” reading to reports. Further work is needed.

4.5.2 Actuality via ACT operator

In this section, I examine a second hypothesis to account for the association between the epistemic modal *qad* with the perfective in MA. This hypothesis is inspired by Homer’s (2011a) proposal. (I have already elucidated this in Section 2.3.5 of Chapter 2 of this dissertation.). In Homer (2011a), an ‘actuality entailment operator’ (ACT) is projected in the derivation to save the coercion that is caused by merging a stative predicate with perfective aspect. This type of coercion is known in the literature as ‘aspectual coercion’. In what follows, I give a brief overview of Homer’s proposal. Afterwards, I propose the presence of the ACT operator in the computation of the MA epistemic modal *qad* with the perfective to yield AEs.¹⁰ In this section, I talk about crucial facts that are associated with the epistemic modal *qad*. I find Homer’s proposal offering fruitful insights into the triggering of AEs in the context of the modal *qad* and the perfective.

¹⁰My proposal is parallel to Hacquard’s in linking perfective to AEs, but the mechanisms involved will be very different.

Let us recall Homer’s famous example for computing coercion with stative predicates, as shown in (85).

- (85) la maison a coûté 100,000 €. (The house has cost 100,000 €) ‘The house was bought for 100,000€.’ (Homer, 2011a, p.6)

In (85), the sentence has a stative predicate “costs” that can give rise to AEs with the perfective in French. Given the property of perfective aspect, it requires a “bounded” eventuality, the denotations of events associated with perfective morphology have to be interpreted as actions in order to match this bounded property of the perfective. Notice that “costs” does not entail action or instantiation, but rather a stative predicate. As a result, a clash occurs between the requirements of perfective aspect and the stative predicate in (85). The phenomenon that resolves the clash between the perfective and the stative predicate is called ‘aspectual coercion’ (Homer, 2011a; Hacquard, 2014).

To resolve this mismatch, an ‘actuality entailment operator’ (ACT) is triggered to enrich the system (Homer, 2011a). This operator will take the stative predicate and return a bounded one to satisfy the perfective aspect’s selectional restriction. The ACT operator merges between the predicate of eventualities and perfective aspect.

As we have seen in Chapter 2, Homer extends his proposal by claiming that the ACT saves the aspectual clash occurring with French root ability modals. For Homer, ability modals are naturally stative and not bounded. They are unbounded in the sense that they do not require instantiation or action. The addition of ACT would invoke AEs in this case.

Turning to the epistemic modal *qad*, I propose that an ACT operator inspired by Homer’s (2011a) proposal is also present in the case of *qad* with the perfective¹¹. I sug-

¹¹My proposal for ACT here is different from Homer’s (see Chapter 2).

gest that the composition in (86) would be, as in (87).

- (86) Muna qad naθθafat yurfat-ha.
 Muna qad clean.3.SG.F.PFV. room-her
 ‘Muna indeed cleaned her room, (#but she didn’t).’ (MA)

- (87) [*qad* [Past [Perfective [ACT [VP]]]]]

As you can see in (87), an ACT operator scopes over the denotations of VP. I propose the following denotation for the ACT operator, which incorporates aspects of Hacquard’s PED, as in (88).

- (88) $[[ACT]]^{w@} = \lambda P. \lambda e. \lambda w. P(e)(w) = 1 \wedge e$ has a counterpart with the same properties as in w in $w^@$.

According to (88), the ACT operator combines with a property of the eventuality e in the worlds w that holds identically with eventuality e in the actual world $w^@$. This preservation of the properties of describing events across worlds is inspired by Hacquard’s (2006; 2009) default pragmatic principle ‘Preservation of Event Description’ (PED). (I have illustrated this point in Section 2.3.3 of Chapter 2 of this dissertation.) It is repeated in (89) for convenience.

- (89) **Preservation of Event Description (PED):** for all worlds w_1, w_2 , if e_1 occurs in w_1 and in w_2 , and e_1 is a P-event in w_1 , then e_1 is a P-event in w_2 as well.

(Hacquard, 2009, p.298)

Let us apply the proposed lexical entry for the ACT operator in the toy example *Muna cleaned her room* in (86). The ACT operator needs to combine with the denotation of the VP *Muna cleaned her room*. The result of this combination is given in (90).

- (90) $[[ACT]]^{w@} ([[Muna cleaned her room]])$

In (90), I will take the VP to denote a property of events of *Muna cleaning her room* in the evaluation world. Building on Hacquard's (2006; 2009) convention: $\lambda e. \text{clean}(e, \text{Muna}, \text{her room}, w)$, the result will be as in (91).

$$(91) \quad [[(90)]]^{w@} = \lambda e. \lambda w. \text{clean}(e, \text{Muna}, \text{her room}, w) \wedge e \text{ has a counterpart with the same properties as in } w \text{ in } w@.$$

In (91), this is a property that is true of a cleaning event of her room by Muna in w if and only if it has a matching event with the same properties in the actual world $w@$.

Now, the event denotation needs to map to perfective aspect to specify completeness of the event time which the reference time, as shown in (92).

$$(92) \quad [[\text{Aspect Phrase}]]^{w@} = [[\text{perfective}]]^{w@} ([[\text{ACT Phrase}]]^{w@})$$

$$(93) \quad \lambda t_i. \lambda w_s. \exists e. \text{clean}(e, \text{Muna}, \text{her room}, w) \wedge e \text{ has a counterpart with the same properties as in } w \text{ in } w@ \wedge \text{time}(e) \subseteq t$$

In (93), this is a property that is true of a time t iff there is an event e of Muna cleaning her room in w and it has a matching event with the same properties in the actual world $w@$, where the run-time of e is included in t .

Afterwards, aspect phrase is associated with tense where tense locates *Muna cleaned her room in w* in the past. Adopting the referential theory of tense sketched in Hacquard (2006, 2009) the result of combining AspP with T is given below in (94):

$$(94) \quad \lambda w. \exists e. \text{clean}(e, \text{Muna}, \text{her room}, w) \wedge e \text{ has a counterpart with the same properties as in } w \text{ in } w@ \wedge \text{time}(e) \subseteq t \{t < t^*\}$$

In (94), there is a cleaning event of her room by Muna in w , and the cleaning of her room by Muna has a matching event with the same properties in the actual world $w@$. Tense

locates the cleaning event of the room by Muna in the past.

Finally, the tense phrase represented by the actualized proposition *Muna cleaned her room* in (94) needs to combine with the epistemic possibility modal *qad*, as shown in (95).

$$(95) \quad [[Qad]]^{f,g,w^@} ([[TP]])$$

Kratzer's epistemic modal system is applied into the lexical entry of the modal *qad*, as presented in (96).

$$(96) \quad [[Qad]]^{f,g,w^@} = \lambda f. \lambda g. \lambda p. \exists w' \in \text{MAX}_{g(w^@)}: (\bigcap f(w^@): q(w')=1$$

The expected truth conditions of the toy example in (86) are presented below:

$$(97) \quad [[(86)]]^{f,g,w^@} = 1 \text{ iff } \exists w' \in \text{MAX}_{g(w^@)}: (\bigcap f(w^@): \exists e. \text{clean}(e, \text{Muna}, \text{her room}, w) \wedge e \text{ has a counterpart with the same properties as in } w' \text{ in } w^@ \wedge \text{time}(e) \subseteq t \{t < t^*\})$$

The sentence in (97) will be true iff there is a world w' that is compatible with what the speaker knows in w such that there is also an event of cleaning the room by Muna in w' .

The event of cleaning her room by Muna has a matching event with the same properties in the actual world $w^@$. Tense locates the cleaning event of the room by Muna in the past.

Finally, the epistemic possibility modal *qad* would have the usual quantificational force identified earlier. The function of the ACT operator, on the other hand, is to ensure that it scopes over an event with matching properties in the actual world. Under this proposal, modality does not collapse, and we obtain AEs with perfective aspect.

To summarize, in this section, I have examined an alternative proposal of the epistemic modal *qad* with the perfective. The main idea in this proposal is the projection of an ACT operator below the perfective. I assume that the ACT operator is absent with an imperfective VP complement, hence AEs are not invoked under this structure. Therefore,

a possibility interpretation is obtained with the imperfective VP complement analogous to English possibility modals *may* and *might*. The following section presents an evaluation of the two proposals that I have elucidated so far in Section 4.5.1 and in Section 4.5.2.

4.5.3 Evaluation of the two proposals:

Considering the above two proposals for deriving AEs with the epistemic modal *qad* and perfective aspect, I offer an evaluation of the two proposals in this section. The first proposal, which derives AEs via manipulation of the ordering source, seems to be more appealing than the alternative proposal yielding the ACT operator.

The narrowed ordering source seems more naturally anchored to the intuitions of the perfective. The narrow ordering source, which includes the set of the best worlds, is coherent with the perfective's properties. The perfective requires events to be bounded and have an end point. At this point, evidence for the event becomes available. There is no need to overload the system with an intervening operator, the ACT operator, between event denotations and perfective aspect. The modal quantificational domain has only one world, which is the actual world. Also, the speaker asserts the completion of the property of the event based on the available facts and evidence provided by the context in the actual world. (Recall that the actual world is the only world where all the evidence available in the actual world is indeed available.). It is not possible for different worlds to have exactly matching evidence. As a result, AEs are associated with *qad* and the perfective. (Again, I have to remind the reader that my analysis accounts for the epistemic modal *qad* in the 'indeed reading'. The second reading, which is the completely or 'already reading', is left for future research.)¹².

Chapter 4 establishes a relationship between the epistemic possibility modal *qad* and

¹²It may be that an attempt be account for the full range of readings of *qad* would make an aspectual coercion proposal more appealing. This is left for future research.

perfective aspect, which contradicts the standard assumptions by Bhatt (1999, 2006); Hacquard (2006, 2009); Portner (2009). By manipulating the ordering source with the perfective, I successfully generate AEs, while the imperfective always yields only epistemic possibility.

Finally, my findings are compatible with the existence of a modal component with the perfective, so the epistemic modal component is not eliminated when it interacts with the perfective. The type of reading we obtain is due to a very restricted ordering source, illustrated in Section 4.4.2. On the contrary, the broad ordering source with the imperfective causes the epistemic possibility modal component to be very direct and clear across examples.

4.6 Conclusion

My investigation has revealed an interesting correspondence between the epistemic possibility modal and aspect that has not as yet been accounted for in the literature on modality and aspect. This chapter aims at introducing an analysis without giving up the standard semantics of Kratzer's (1981; 1991; 2012) modal theory and Kratzer's (1998) aspect.

The MA epistemic modal *qad* provides a novel piece of evidence of the sensitivity with aspect. As I explained, two readings are derived, depending on whether the epistemic modal *qad* has a perfective or imperfective VP complement.

My proposal accounts for *qad* with perfective and imperfective aspects. With a perfective, the modal *qad* has a simple necessity reading. The simple necessity reading is due to a narrow ordering source, and AEs result. On the other hand, having an imperfective VP complement causes the ordering source of *qad* to be broad. Consequently, the epistemic possibility reading is available while AEs are blocked.

More research is needed to explore the relation between the perfective and AEs. In

my proposal for *qad*, the link between the perfective and a special ordering source remains unexplained (though I have tried to intuitively link this to evidence available with the perfective). My proposal is in the spirit of Hacquard's work, that stipulates the link between the perfective and the actual world. Further research is needed to relate the two views.

Chapter 5

Conclusion and future research

5.1 Introduction

In this dissertation, I have explored modality and aspect in Makkan Arabic (MA). To the best of my knowledge, the topics of MA modality and aspect have not been investigated in the literature of formal semantics. My discussion about the multiple interpretations of modal auxiliaries in Makkan Arabic has been inspired by Kratzer's (1981; 1991) well-known proposal for English modals and aspect and more recent proposals for the interaction between modality and aspect.

As I have described in Chapter 1, the flavours of MA modals allow for the same / similar classification as English modals. MA modals (semi-modals and verbal modals) can be classified roughly into epistemic vs. root modals. Like English modals, each MA modal category—epistemic or root—can receive various interpretations. These various interpretations depend on what the context provides in terms of facts, laws or regulations, the speaker's evidence, the speaker's desire, etc. In light of Kratzer's (1981; 1991; 2012) proposal for the modal system, variation in the interpretation of modal expressions can be captured by appealing to contextually supplied conversational backgrounds (which can be thought of as parameters of the interpretation function). One conversational background is typically known as the 'modal base' (f). It assigns propositions to a possible world, and varies with the type of modal. With epistemic modals, the modal base f identifies

available evidence, or the speaker's knowledge or beliefs. With root modals, on the other hand, the modal base f is typically corresponds to facts / true propositions. These modal bases are known as 'circumstantial'. The modal base provides a first approximation to the domain of quantification of a modal. In Kratzer's system, the modal's final interpretation is determined by a second conversational background (also a parameter of the interpretation function) that is know as the 'ordering source' (' g '). The function of the ordering source g is to rank the worlds in the intersection of the modal base, identifying a subset that corresponds to the BEST-worlds (see discussion in Portner (2009)). Semanticists working on modality do not always flesh out both the modal base and ordering source of a modal. We have seen, for example, that Hacquard's work mostly sets aside the ordering source. At times, however, both parameters play a crucial role, as in Kratzer's discussion of modals without duals. In presenting my account, I have simplified the analysis and set aside the ordering source at times, while I have made crucial use of it at other times (e.g. to explain AEs in the scope of *qad*).

Kratzer's original proposal did not contemplate the role of aspect in establishing the flavour of modality. There has been growing interest in this dimension, however, since the seminal work by Bhatt (1999, 2006) who observed that some aspectual heads seemed to 'eliminate' modality giving rise to AEs. This has been the starting point for my discussion in Chapter 2, where I briefly reviewed Bhatt's discussion, as well as some of the literature that has taken up this topic since. The interaction between the categories of modality and aspect remains at the core of the later chapters of the thesis as well. In Chapter 3 I extended the discussion of AEs to cases of MA perfect; and in Chapter 4 I extended the discussion to the semi-modal *qad*, which is taken to scope over the projection of aspect. The thesis makes a contribution by adding discussion of new MA data to current

debates. The result is that we find core MA data that is in line with current proposals for the generation of AEs, and we also find MA data that proves of special interest because it shows that there can be variation in the domain of the perfect, and that AEs can be generated when aspect scopes under the modal (this is a second pathway for generating AEs). In what follows, I summarize my research on MA modals and aspect, and I present my views and the arguments developed in this dissertation. At the end of the discussion, I sketch lines for future research.

5.2 The interaction between modals and aspect

My thesis takes as a starting point crucial observations by Bhatt and Hacquard about the interaction between aspect and modality in the generation of AEs. It makes a contribution by providing a first study of (some dimensions of) this puzzle in the domain of MA data.

Chapter 1 of the thesis sets the stage for the later chapters, both empirically and theoretically. On the empirical side, Chapter 1 provides a brief descriptive overview of temporal categories in MA, as well as a presentation of modal expressions. Contrary to English, MA morphology is taken to conflate tense and aspect categories (following well-established proposals in the literature): present + imperfective vs. past + perfective. Within the set of modal expressions, I distinguish between ‘semi modals’ vs. ‘verbal modals’. The latter typically display morphosyntax associated with the verbal paradigm, such as subject agreement and a contrast between imperfective and perfective aspect. The former are (mostly) invariable in their shape. The two types of modal expressions are taken to project in different positions within the structure: verbal modals below aspect, semi-modals above (chapters 2 and 3 are dedicated to the existential root modal *\gdr*, a verbal modal, while chapter 4 is dedicated to the existential epistemic semi-modal *qad*). Chapter 1 also includes a brief overview of some of the key semantic proposals that un-

derly the discussion of aspect and modality. The focus is on work by Kratzer in the domain of tense, aspect and modality. While much of the theoretical discussion in later chapters departs from Kratzer's original proposals to some extent, these remain the foundations for later ideas.

Chapter 2 of the thesis investigates 'classical' AEs in relation to the verbal modal $\backslash gdr \backslash$, comparing the perfective and imperfective form. I present an overview of MA data that parallels data that has been discussed in other languages. I also provide theoretical background on the explanation of AEs in semantics, adopting as the basis for my own proposal the theories developed by Hacquard (2006, 2009, 2014). I show how Hacquard's proposal can account for AEs in MA and develop a compositional account of the interaction between imperfective/perfective and $\backslash gdr \backslash$.

Chapter 3 of the thesis explores the interpretation of the participle of the modal $\backslash gdr \backslash$. I present data showing that constructions with the participle of the modal sometimes give rise to AEs, but not always. I start by arguing that the participle is found in the MA perfect, providing arguments for the existence of the perfect in MA. I then distinguish between two types of perfects, depending on the choice of auxiliary: *kaan* vs. *saar*. Building on Portner's discussion of the perfect in English, I suggest that the perfect in MA lexically disambiguates flavours of the perfect that are conflated in English through the choice of auxiliary. Whereas the *kaan* perfect can be understood as an existential perfect, the *saar* perfect receives a resultative reading. I make a proposal for the two perfects that builds on Hacquard's proposal for perfective, with the suggestion that the *saar* perfect anchors events to the actual world in a manner similar to the perfective. In this chapter I also explore an alternative second explanation for AEs with the *saar* perfect that builds on Condoravdi (2001). According to this view, the difference between the *kaan* and *saar*

perfect does not lie in the interpretation of the auxiliary, but in its projection in the structure. I show that an analysis according to which *kaan* projects above the modal while *saar* projects below it could also provide insights into the generation of AEs. However, I suggest that the earlier proposal is a better fit for the data, since the earlier proposal is better able to explain intuitions about the existential vs. resultative interpretations. Chapter 3 thus makes a contribution to our cross-linguistic understanding of AEs. While earlier proposals that had focused on Romance had argued that AEs arise through association with perfective (and counterexamples had been realized as cases of perfects, see Hacquard 2014), the data from MA shows that there may be cross linguistic variation in the interpretation of the perfect that has important consequences for the generation of AEs.

Chapter 4 of this thesis investigates the interaction between aspect and epistemic *qad*. This is an interesting case study for two reasons: (1) *qad* receives an interpretation as an epistemic modal, not a root modal, and epistemic modals have been found in the literature to not give rise to AEs; and (2) *qad* is a semi-modal, scoping over aspect, and yet it still gives rise to AEs when embedded aspect is perfective. This suggests that in addition to the AEs generated when perfective scopes over a root modal (discussed in the literature), AEs can also be generated through a second path: perfective aspect embedded under a modal. I provide a discussion of theoretical alternatives to explain this interaction. One possibility discussed in Chapter 4 is that an actuality operator (ACT)(inspired by Homer (2011a)) projects below the modal and is responsible for anchoring the eventuality to the actual world. While this possibility could in principle yield correct results, it seems rather 'brute force', introducing an arbitrary operator. The possibility that I favor in Chapter 4 is inspired by Kratzer's observations that manipulations of the ordering source of a modal could affect the characterization of modality (she addresses quantificational strength). I

speculate that the presence of perfective in the embedded clause favors an ordering source linked to evidence of what has happened (and thus to the ‘reportative’ intuition found in traditional grammars). My proposal takes Kratzer’s ideas of reducing the domain of quantification via the ordering source to an extreme, suggesting that this ordering source will only allow the actual world into the domain of evaluation of the modal. In this way, AEs will be triggered. While the discussion of AEs with *qad* is rather preliminary, and more work would be needed to better understand the relation between perfective aspect and evidence in the ordering source, it presents a first attempt to understand the generation of AEs when a modal scopes over aspect.

5.3 Directions for future research

The investigation of the interaction between temporal and modal categories has proven fruitful to our understanding of modality in MA. At the same time, morphosyntactic variation in MA has shed light on our theoretical understanding of how aspect and modality interact. We have learned that variation in the perfect can matter for AEs, and also that aspect below the modal can also be influential. Future work on the interaction between aspect and modality could incorporate differences that have traditionally been classified in the semantics literature as regarding quantificational ‘strength’: the difference between ‘weak’ vs. ‘strong’ necessity modals such as found in English *ought* vs. *must* (e.g. Von Stechow and Iatridou (2008)). As discussed in Chapter 1, MA has two modals that parallel the English ones: *\lzm* “must/have to” and *laabud* “should/ ought to”. The difference was illustrated with the examples and scenarios below:

Imagine a scenario where a mother asks her daughter to do her bed everyday, as a part of household regulation. The mother always repeats the sentence in (1).

(1) Laazim tirattibi sareer-ik kuli yuum.
must you.F.-organize.IMPFV.-you.F. bed-your.F. every day
'You must do your bed everyday.'
(MA)

In (1), strong necessity \lzm\ (must/ have to) has a ‘deontic reading’, in line with Moshref’s (2012) description for Cairene Arabic. Such strong necessity modals cannot be followed by ‘but it is obligatory to do that’, as noted by von Stechow & Iatridou (2008). The intuition is that \lzm\ has a ‘strong obligation’ interpretation. \lzm\ has the modal *laabud* as a ‘weak obligation counterpart’ “ought to/should”, as illustrated in the following scenario for example (2).

Suppose that the mother and the daughter travel to Florida and stay in a hotel for some nights. They are on a vacation now and it is not required by the hotel that they make the beds, but the mother like to tidy up the room before they go out. She is more flexible in this setting, and she uses *laabud* instead of $\backslash lzm \backslash$ in (1):¹.

(2) laabud ti-rattib-i sareer-ik.
ought.to you.F.-tidy.up.IMPFV.-you.F. bed-your.F.
'You ought to tidy up your bed.' (MA)

In (2), *laabud* (ought to/ should) has a weaker necessity reading. The mother could continue the sentence by saying “in fact, you are obliged to do that”, if she wanted to enforce her home regulations.

Note that in examples (1) and (2) the VP complements associated with the two modals are in the imperfective. It is possible to have different aspect in the complement, but then the modal interpretation changes. Consider first a scenario where a mother is wondering if her son Asem left for school without having breakfast. She asks Asem's father whether Asem has had breakfast before leaving. The father can see crumbs on a plate and dirty cup in the sink, so he says (3):

¹The embedded clause of the semi-modal *laabud* might be headed by *ʔin* in more formal speech.

- (3) Laazim faṭar.
 laazim have.breakfast.3.SG.M.PRFV.
 ‘He must have eaten/had his breakfast, (#but I am sure that he did).’ (MA)

In (3), Asem’s father makes his judgments on the basis of the available evidence in the situation. Having changed the embedded clause to perfective, the modal flavour is now epistemic. Importantly, the sentence cannot be continued with the statement “, but I am sure that he did” (in parallel with what we observed for the deontic cases earlier). Let us consider the same set up, but with the modal *laabud*, as in (4).

- (4) laabud (ʔinnu) faṭar.
 laabud (ʔinn.he) have.breakfast.3.SG.M.PRFV.
 ‘He ought to have eaten/had his breakfast, (but I am sure that he did).’ (MA)

In (4), Asem’s father does not see signs of someone having breakfast in the kitchen, unlike (3). It is also possible to continue the sentence with “but I am sure that he did”. Notice that the content of the weak necessity *laabud* “ought to/ should” does not give rise to the same degree of strength as \lzm\ “must/ have to”.

As the examples illustrate, the choice of perfective vs. imperfective in the embedded clause has consequences for the modal flavour of the interpretation, while the contrast between ‘strong’ vs. ‘weak’ necessity seems to be maintained. Future work would be needed to explain the variation in strength between *lazim* and *labud* (see discussions for other languages in Von Stechow and Iatridou (2008); Werkmann (2014); Rubinstein (2012)). Future work would also be needed to explain the link between the flavour of modality and aspect in the embedded clause (similar to what is found in English, where past orientation of the embedded clause is linked to epistemic interpretations of modals, while future orientation is more clearly linked to deontic readings, see Condoravdi (2001)). While I am not able to explore the role of aspect in this domain, the variation shows that the study of aspect in relation to modality has also potential beyond the puzzles that I have

addressed in this dissertation.

5.4 Concluding Remarks

This thesis makes a contribution to the growing cross-linguistic literature that investigates the relation between aspect and modality. The thesis makes novel observations regarding data from MA that will be useful to researchers working in this domain. The thesis also makes proposals to explain the MA data, partly adopting earlier accounts, and partly extending previous theories to capture novel data. While some of the proposals in this thesis may be preliminary, the thesis presents first steps in relating MA data to current debates on aspect and modality in the semantic literature.

Bibliography

Abd El-Moneim, A. A. (1989). *The role of INFL*. PhD thesis, University of Connecticut.

Abdel-Fattah, M. (2005). On the translation of modals from english into arabic and vice versa: the case of deontic modality. *Babel*, 51(1):31–48.

Adger, D. (2003). *Core syntax: A minimalist approach*, volume 20. Oxford University Press Oxford.

Ahmad, S. A.-d. M. (977). *Noor Al-Sajyah fi hal Al-Faath Al-Ajroomyah*. Lebanon: Dar Al-Kotob Al-ilmiyah.

Al-Ansaarie, J. A. (1964). *Mugnie Al-Laheeb*. Daar Al-Fikir.

Al-Balushi, R. A. (2011). *Case in standard Arabic: The untraveled paths*. PhD thesis.

Al-Kuwari, K. (2011). *Al-Waseet fi Al-Nafiou*. Lebanon: Dar Ibn Hazm.

Al-Kuwarie, K. (2009). *Jami' Al-Durrus Al-Arabyah*. Lebanon: Al-Maktabah Al-Assrya.

Al-Muradi, I. L. (1992). *Al-Janie fi Huroof AL-Ma'anie*. Beirut: Dar Al-Kutub Al-Elmyah.

Al-Shorafat, M. O. (2012). Subject-verb agreement in standard arabic: A minimalist approach. *SKASE Journal of Theoretical Linguistics*, 9(1).

- Alexiadou, A. and Anagnostopoulou, E. (2002). Raising without infinitives. *Dimensions of Movement: from features to remnant*. Amsterdam: John Benjamins, pages 17–30.
- Alexiadou, A., Anagnostopoulou, E., Iordachioaia, G., Marchis, M., Müller, G., and Kiss, T. (2012). In support of long distance agree. *Local modelling of non-local dependencies in syntax*, pages 55–81.
- Alexiadou, A., Anagnostopoulou, E., and Wurmbrand, S. (2014). Movement vs. long distance agree in raising: Disappearing phases and feature valuation. In *Proceedings of the North Eastern Linguistics Society Annual Meeting*, volume 43, pages 1–12.
- Alharbi, B. Y. (2017). The syntax of copular clauses in arabic.
- Alxatib, S. (2015). Actuality entailment in palestinian arabic. In *Proceedings of the 46th Meeting of the North East Linguistics Society at Concordia University, Montréal, Québec*., volume 1, pages 11–23. Department of Linguistics: UMASS: Graduate Linguistics Student Association.
- Alxatib, S. (2016). Actuality entailments, negation, and free choice inferences. In *Semantics and Linguistic Theory*, volume 26, pages 451–470.
- Aoun, J. E., Benmamoun, E., and Choueiri, L. (2010). *The syntax of Arabic*. Cambridge University Press.
- Arregui, A. (2005). *On the accessibility of possible worlds: The role of tense and aspect*. Citeseer.
- Arregui, A., Rivero, M. L., and Salanova, A. (2011). Imperfectivity: Capturing variation across languages. *MIT Working Papers in Linguistics*, 75:53–68.
- Bahloul, M. (2008). *Structure and function of the Arabic verb*. Routledge.

- Bahloul, M. (2016). The particle qad in arabic: Is it a syntactic filler? *Brill's Journal of Afroasiatic Languages and Linguistics*, 8(2):261–285.
- Baker, M. C. (2008). *The syntax of agreement and concord*, volume 115. Cambridge University Press.
- Bauer, G. (1970). The english 'perfect' reconsidered. *Journal of Linguistics*, 6(2):189–198.
- Beeston, A. F. L. (2016). *The Arabic language today*. Routledge.
- Benmamoun, E. (1999). Arabic morphology: The central role of the imperfective. *Lingua*, 108(2-3):175–201.
- Benmamoun, E. (2000). *The feature structure of functional categories: A comparative study of Arabic dialects*. Oxford University Press.
- Bhatt, R. (1999). Covert modality in non-finite contexts: University of pennsylvania dissertation.
- Bhatt, R. (2006). *Covert modality in non-finite contexts*, volume 8. Walter de Gruyter.
- Bhatt, R., Bögel, T., Butt, M., Hautli, A., Sulger, S., and King, T. H. (2011). *Urdu/hindi modals*. Bibliothek der Universität Konstanz.
- Boneh, N. (2010). Perfect constructions in syrian arabic. *Layers of Aspect*, pages 23–42.
- Borer, H. (1989). Anaphoric agr. In *The null subject parameter*, pages 69–109. Springer.
- Bybee, J.L., P. R. and Pagliuca, W. (1994). *The evolution of grammar: Tense, aspect, and modality in the languages of the world (Vol. 196)*. Chicago: University of Chicago Press.

- Chomsky, N. (1993). Lectures on government and binding: The pisa lectures. 1981. *Mouton de Gruyter, Berlin and New York*.
- Chomsky, N. (1995). The minimalist program, cambridge, massachussets.
- Chomsky, N. (2000). Minimalist inquiries: The framework (mitopl 15). *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, pages 89–155.
- Cinque, G. (1999). *Adverbs and functional heads: A cross-linguistic perspective*. Oxford University Press on Demand.
- Comrie, B. (1976). *Aspect: An introduction to the study of verbal aspect and related problems*, volume 2. Cambridge university press.
- Condoravdi, C. (2001). Temporal interpretation of modals-modals for the present and for the past. In *The construction of meaning*. Citeseer.
- Copeland, B. J. (2002). The genesis of possible worlds semantics. *Journal of Philosophical logic*, 31(2):99–137.
- Darzi, A. and Kwak, S. (2015). Syntax and semantics of subjunctive clauses in persian. *Lingua*, 153:1–13.
- Davis, H., Matthewson, L., and Rullmann, H. (2009). Out of control?marking as circumstantial modality in stʔátʔimcets. *Cross-linguistic semantics of tense, aspect and modality*, pages 205–244.
- Davisa, H., Louiea, M., Matthewsona, L., Paulb, I., Petersona, T., and Reis-Silvaa, M. A. Perfective aspect and circumstantial modality: A cross-linguistic approach.
- Demirdache, H. and Uribe-Etxebarria, M. (2008). Scope and anaphora with time arguments: The case of ʔperfect modals? *Lingua*, 118(11):1790–1815.

- Den Dikken, M. (2007). Phase extension contours of a theory of the role of head movement in phrasal extraction. *Theoretical linguistics*, 33(1):1–41.
- Dobrovie-Sorin, C. (2001). Head-to-head merge in balkan subjunctives and locality. *Comparative syntax of Balkan languages*, pages 44–73.
- Dowty, D. R. (1979). *Word meaning and Montague grammar: The semantics of verbs and times in generative semantics and in Montague's PTQ*, volume 7. Springer Science & Business Media.
- Fakih, A.-H. A. (2016). Agreement in standard arabic vso and svo word orders: a feature-based inheritance approach. *Theory and practice in language studies*, 6(1):21–33.
- Farkas, D. (1992). On obviation. *Lexical matters*, 1:85–109.
- Fassi Fehri, A. (1993). Issues in the structure of arabic clauses and words (vol. 29). *Studies in natural language and linguistic theory*.
- Fassi Fehri, A. (2003). Arabic perfect and temporal adverbs. *Perfect explorations*, pages 69–100.
- Fassi Fehri, A. (2012). *Key features and parameters in Arabic grammar*. J. Benjamins Publishing Company.
- Hacquard, V. (2006). *Aspects of modality*. PhD thesis, Massachusetts Institute of Technology.
- Hacquard, V. (2007). Speaker-oriented vs. subject-oriented modals: A split in implicative behavior. In *Proceedings of Sinn und Bedeutung*, volume 11, pages 305–319. Citeseer.
- Hacquard, V. (2009). On the interaction of aspect and modal auxiliaries. *Linguistics and Philosophy*, 32(3):279–315.

- Hacquard, V. (2010). On the event relativity of modal auxiliaries. *Natural language semantics*, 18(1):79–114.
- Hacquard, V. (2011). Modality.—[in:] klaus von heusinger, claudia maienborn, paul portner (eds.): *Semantics: an international handbook of natural language meaning*. Berlin: Mouton de Gruyter, pages 1484–1515.
- Hacquard, V. (2014). Actuality entailments. *Under review for Companion to Semantics*. Eds. L. Matthewson, C. Meier, H. Rullmann, TE Zimmermann. London: Wiley.
- Hacquard, V., Blaszczak, J., Giannakidou, A., Klimek-Jankowska, D., and Migdalski, K. (2016). Modals: Meaning categories? *Mood, aspect, modality revisited: New answers to old questions*, pages 45–74.
- Hallman, P. (2015). The arabic imperfective. *Brill's Journal of Afroasiatic Languages and Linguistics*, 7(1):103–131.
- Hallman, P. (2016). The universal perfect in syrian arabic. *Brill's Journal of Afroasiatic Languages and Linguistics*, 8(1):76–100.
- Hallman, P. (2017). Participles in syrian arabic. *Perspectives on Arabic Linguistics XXIX*, pages 153–179.
- Hassanein, A. (2006). *Modern Standard Arabic Grammar: A Concise Guide*. American Univ in Cairo Press.
- Hiraiwa, K. (2001). Multiple agree and the defective intervention constraint in japanese. *MIT working papers in linguistics*, 40(40):67–80.
- Homer, V. (2011a). French modals and perfective: A case of aspectual coercion. In

- Proceedings of the 28th West Coast Conference on Formal Linguistics*, pages 106–114. Citeseer.
- Homer, V. (2011b). *Polarity and modality*. PhD thesis, University of California, Los Angeles.
- Hornstein, N. (1999). Movement and control. *Linguistic inquiry*, 30(1):69–96.
- Iatridou, S. (1993). On nominative case assignment and a few related things. *MIT working papers in linguistics*, 19:175–196.
- Iatridou, S., Anagnostopoulou, E., and Izvorski, R. (2001). Observations about the form and meaning of the perfect. *Current Studies in Linguistics Series*, 36:189–238.
- Izvorski, R. (1997). The present perfect as an epistemic modal. In *Semantics and Linguistic Theory*, volume 7, pages 222–239.
- Jackendoff, R. S. (1971). Modal structure in semantic representation. *Linguistic Inquiry*, 2(4):479–514.
- Joseph, B. D. and Joseph, B. D. (1983). *The synchrony and diachrony of the Balkan infinitive: A study in areal, general and historical linguistics*, volume 1. Cambridge University Press.
- Karawani, H. and Zeijlstra, H. (2013). The semantic contribution of the past tense morpheme kaan in palestinian counterfactuals. *Journal of Portuguese Linguistics*, 12(1).
- Kawari, K. (2011). *Alwaseet fi Al-Nafiou*. Lebanon: Daar Ibn Hazm.
- Kinberg, N. (1992). Semi-imperfectives and imperfectives: A case study of aspect and tense in arabic participial clauses. *Lingua*, 86(4):301–330.

- Klein, W. (1994). *Time in languages*. Routledge.
- Krapova, I. (2001). Subjunctives in bulgarian and modern greek. *Comparative syntax of Balkan languages*, pages 105–126.
- Kratzer, A. (1977). What ?must?and ?can?must and can mean. *Linguistics and philosophy*, 1(3):337–355.
- Kratzer, A. (1981). The notional category of modality. words, worlds, and contexts. eik-meyer and rieser, hrsg.
- Kratzer, A. (1991). *Semantics: An international handbook of contemporary research*. Walter de Gruyter.
- Kratzer, A. (1998). More structural analogies between pronouns and tenses. In *Semantics and linguistic theory*, volume 8, pages 92–110.
- Kratzer, A. (2012). *Modals and conditionals: New and revised perspectives*, volume 36. Oxford University Press.
- Kratzer, A. and Heim, I. (1998). *Semantics in generative grammar*. Blackwell Oxford.
- Kripke, S. A. (1963). Semantical analysis of modal logic i normal modal propositional calculi. *Mathematical Logic Quarterly*, 9(5-6):67–96.
- Landau, I. (2001). *Elements of control: Structure and meaning in infinitival constructions*, volume 51. Springer Science & Business Media.
- Landau, I. (2004). The scale of finiteness and the calculus of control. *Natural Language & Linguistic Theory*, 22(4):811–877.

- Lewis, D. (1973). Counterfactuals and comparative possibility. In *Ifs*, pages 57–85. Springer.
- Makkawi, A. (2015). *Participles as non-verbal predicates*. MA Thesis: The University of Manitoba.
- Mari, A. and Martin, F. (2007). Tense, abilities and actuality entailment. In *Proceedings of the Amsterdam Colloquium*, pages 151–156.
- Mari, A. and Martin, F. (2008). Perfective and imperfective in french kinds of abilities and actuality entailment (and some notes on epistemic readings).
- Matthewson, L. (2005). *When I was small-I was kwikws: A grammatical analysis of St'át'imcets oral narratives*. Vancouver: UBC Press.
- Matthews, P. H. (1991). Morphology (cambridge textbooks in linguistics). *New York: Cambridge University*.
- Matthewson, L. (2006). Temporal semantics in a superficially tenseless language. *Linguistics and Philosophy*, 29(6):673–713.
- Matthewson, L., Davis, H., and Rullmann, H. (2007). Evidentials as epistemic modals: Evidence from st'át'imcets. *Linguistic variation yearbook*, 7(1):201–254.
- McCawley, J. D. (1981). Notes on the english present perfect. *Australian journal of linguistics*, 1(1):81–90.
- Meziani, A. (1983). Modality in english and moroccan arabic. *IRAL-International Review of Applied Linguistics in Language Teaching*, 21(4):267–282.
- Michalski, M. (2011). On the function of the verbal particle la-qad in modern standard arabic. *Folia Orientalia*, 48:99–113.

- Mitchell, T. F. (1978). Educated spoken arabic in egypt and the levant, with special reference to participle and tense. *Journal of Linguistics*, 14(2):227–258.
- Mohammad, M. A. (2000). *Word order, agreement and pronominalization in Standard and Palestinian Arabic*, volume 181. John Benjamins Publishing.
- Moshref, O. (2012). *Corpus study of tense, aspect, and modality in diglossic speech in Cairene Arabic*. PhD thesis, University of Illinois at Urbana-Champaign.
- Nugraha, T. C., Cristiana, D., and Hidayat, S. (2013). Arabic and indonesian modality: A contrastive analysis.
- Ouhalla, J. (2005). Agreement features, agreement and antiagreement. *Natural Language & Linguistic Theory*, 23(3):655–686.
- Parsons, T. (1990). *Events in the Semantics of English*, volume 334. MIT press Cambridge, MA.
- Partee, B. (1973). Some structural analogies between tenses and pronouns in english. *Journal of Philosophy*, 70(18):601–609.
- Peterson, T. (2008). The ordering source and graded modality in gitksan epistemic modals. In *Sinn und Bedeutung*, volume 13.
- Philippaki-Warbuton, I. (1987). The theory of empty categories and the pro-drop parameter in modern greek. *Journal of linguistics*, 23(2):289–318.
- Piñón, C. (2003). Being able to. In *WCCFL 22 Proceedings*, pages 384–397. Cascadilla Press Somerville.
- Piñón, C. (2009). Another look at the actuality entailment of certain modal verbs. *Generativity: Interpretation and Uses I, Paris, ENS, May*, pages 11–13.

- Pinón, C. (2011). The pragmatics of actuality entailment. In *Workshop Aspect and Modality in Lexical Semantics, Stuttgart*, volume 30.
- Portner, P. (2000). The (temporal) semantics and (modal) pragmatics of the perfect (pre-print). Georgetown University.
- Portner, P. (2003). The (temporal) semantics and (modal) pragmatics of the perfect. *Linguistics and Philosophy*, 26(4):459–510.
- Portner, P. (2009). *Modality*, volume 1. Oxford University Press.
- Rizzi, L. (1997). The fine structure of the left periphery. In *Elements of grammar*, pages 281–337. Springer.
- Roussou, A. (2001). Control and raising in and out of subjunctive complements. *Comparative syntax of Balkan languages*, 74:104.
- Rubinstein, A. (2012). *Roots of modality*. PhD thesis, University of Massachusetts Amherst.
- Rullmann, H., Matthewson, L., and Davis, H. (2008). Modals as distributive indefinites. *Natural Language Semantics*, 16(4):317–357.
- Ryding, K. C. (2005). *A reference grammar of modern standard Arabic*. Cambridge university press.
- Smith, C. S. (2013). *The parameter of aspect*, volume 43. Springer Science & Business Media.
- Soltan, U. (2007). *On formal feature licensing in minimalism: Aspects of Standard Arabic morphosyntax*. PhD thesis.

- Suleiman, Y. (2013). *Arabic grammar and linguistics*. Routledge.
- Terzi, A. (1997). Pro and null case in finite clauses. *The Linguistic Review*, 14(4):335–360.
- Tsujimura, M. (2003). Wcfl22 proceedings. *Somerville, MA: Cascadilla*.
- Vendler, Z. (1976). Verbs and times. *The philosophical review*, 66(2):143–160.
- Von Fintel, K. and Iatridou, S. (2008). How to say ought in foreign: The composition of weak necessity modals. In *Time and modality*, pages 115–141. Springer.
- Werkmann, A. (2014). *On modal strength in Croatian*. Ottawa University Dissertation.
- Wightwick, J. (2017). *Arabic verbs & essentials of grammar*. McGraw Hill Professional.
- Wolfgang, K. (1994). Time in language. *London and New York: Routledge*.
- Wright, W. and Caspari, C. P. (1964). A grammar of the arabic language: translated from the german of caspari, and edited with numerous additions and corrections.
- Wurmbrand, S. (2002). Syntactic versus semantic control. In *Studies in comparative Germanic syntax: Proceedings from the 15th workshop on comparative Germanic syntax*, volume 53, page 93. John Benjamins Publishing.
- Zayed, S. (1983). *A pragmatic approach to modality and the modals: With application to literary Arabic*. PhD thesis, University of Edinburgh.