Free Choice Items: The view from Farsi

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Abstract

Free choice items are quantificational determiner phrases (DPs) with seemingly variable quantificational force: in downward entailing contexts, free choice items contribute existential quantification, but in modal contexts they yield truth conditions stronger than those expected from existential DPs.

An influential line of research (Chierchia, 2013) takes free choice items to be existential quantifiers that introduce into the semantic derivation a set of alternative meanings, which are used by an exhaustivity operator to strengthen truth conditions.

This thesis probes into the nature of the exhaustification process associated with free choice items through the analysis of a number of DPs in Farsi (Indo-Iranian) that exhibit core free choice item behavior, but with some modulations.

Chapters 2 and 3 focus on *yek-i* DPs. The behavior of these items suggests that the alternatives that they introduce can be pruned under the threat of deriving a contradiction or weakening the meaning of the sentence that they are contained in. It also suggests that exhaustification can be selective: that different types of alternatives can be the target of different types of exhaustivity operators. Chapters 4 and 5 analyze *har-i* DPs. These items show prototypical free choice item behavior, unless they are inflected in the accusative. This behavior is argued to follow from a drastic restriction of the set of alternatives to a singleton set. Finally, Chapter 6 examines *hame-i* DPs. The quantificational force of these DPs oscillates between existential and universal. This behavior is argued to follow from the types of alternatives that these items introduce.

Abrégé

Les éléments à choix libre sont des syntagmes déterminatifs (SD) quantificateurs dont la force semble variable: dans les contextes à implication descendante, ils contribuent à une quantification existentielle, mais dans les contextes modaux, ils aboutissent à des conditions de vérité plus fortes que celles attendues des SD existentiels.

Une ligne de recherche influente (Chierchia, 2013) considère les éléments à choix libre comme des quantificateurs existentiels qui introduisent dans la dérivation sémantique un ensemble de significations alternatives, utilisées par un opérateur d'exhaustivité pour renforcer les conditions de vérité.

Cette thèse examine la nature du processus d'exhaustivité associé aux éléments à choix libre en analysant un certain nombre de SD en Farsi (langue Indo-Iranienne) qui présentent un comportement central d'élément à choix libre, mais avec quelques modulations.

Les chapitres 2 et 3 se concentrent sur les SD *yek-i*. Le comportement de ces éléments suggère que les alternatives qu'ils introduisent peuvent être élaguées sous peine de contradiction ou d'affaiblissement du sens de la phrase dans laquelle ils sont contenus. Cela suggère également que l'exhaustivité peut être sélective : différents types d'alternatives peuvent être la cible de différents types d'opérateurs d'exhaustivité. Les chapitres 4 et 5 analysent les SD *har-i*. Ces éléments présentent un comportement prototypique d'élément à choix libre, sauf s'ils sont fléchis à l'accusatif. Ce comportement découlerait d'une restriction drastique de l'ensemble des alternatives à un ensemble singleton. Enfin, le chapitre 6 examine les SD *hame -i*. La force quantificatrice de ces SD oscille entre existentielle et universelle. Ce comportement découlerait des types d'alternatives que ces éléments introduisent.

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List of abbreviations

#	Infelicitous structure
*****	Ungrammatical structure
1	First person
2	Second person
3	Third person
ACC	Accusative marker
ALT	Alternative
D-ALT	Domain alternative
DE	Downward entailing
DP	Determiner phrase
EFCI	Existential free choice item
EZ	Ezafe marker
EXH-D-ALT	Pre-exhaustified domain alternative
FCI	Free choice item
IND	Indefinite
INDIC	Indicative
LF	Logical form
NEG	Negation
PL	Plural
SG	Singular
SUBJ	Subjunctive
UFCI	Universal free choice item

Contribution to original knowledge

This is a manuscript-based thesis, with chapters structured to incorporate previously published work in the following way:

- Chapter 1 is new.
- Chapter 2 largely reproduces the content of Alonso-Ovalle and Moghiseh 2019a, with the exception of Section 2.5, which is new.
- Chapter 3 is new.
- Chapter 4 reproduces content from Alonso-Ovalle and Moghiseh 2019b.
- In Chapter 5, the content is primarily reproduced from Alonso-Ovalle and Moghiseh 2021, while Section 5.2.4 is new.
- Chapter 6 reproduces the content of Alonso-Ovalle and Moghiseh 2022.

The introductory chapter explains the interrelations between the chapters and how they fit within the broader scope of the thesis.

Contribution of authors

In the co-authored publications included in this thesis, listed below, the authors' names are listed in alphabetical order. In these collaborative works, the author of the thesis is a co-first author.

1. Alonso-Ovalle, L. and E. Moghiseh (2019a). Contradiction-free strengthening and alternative discharge: The case of Farsi *-i* indefinites. In M. Espinal, E. Castroviejo, M. Leonetti, L. McNally, and C. Real-Puigdollers (Eds.), *Proceedings of the 23rd Sinn und Bedeutung*, pp. 1–18.

2. Alonso-Ovalle, L. and E. Moghiseh (2019b). Neutralizing free choice items via maximal domain restriction: Farsi *i-* indefinites. In K. Blake, F. Davis, K. Lamp, and J. Rhyne (Eds.), *Proceedings of the 29th Semantics and Linguistic Theory*, pp. 686–705.

3. Alonso-Ovalle, L. and E. Moghiseh (2021). Numeral *any*: the view from Farsi. In J. Rhyne, K. Lamp, N. Dreier, and C. Kwon (Eds.), *Proceedings of the 30th Semantics and Linguistic Theory*, pp. 485–503.

4. Alonso-Ovalle, L. and E. Moghiseh (2022). Universal force from exhaustification: Farsi *hame*-i DPs. In J. R. Starr, J. Kim, and B. Öney (Eds.), *Proceedings of the 32nd Semantics and Linguistic Theory*, pp. 619–638.

Contents

Chapter 1

Introduction

1.1 Free Choice Items

This thesis explores a variety of quantificational determiner phrases whose interpretation is sensitive to the environment in which they occur. Items of such sort exist across languages. DPs headed by English *any* ('*any* DPs') belong to this category.

In downward entailing (DE) contexts, *any* DPs are interpreted as existential quantifiers. The sentence in (1) with an *any* DP, for instance, conveys that no question was answered, just as its counterpart with the regular existential determiner *a* in (2) does. The truth-conditions for both (1) and (2) can be stated as in (3), where *any* contributes existential quantification under negation.

(1) Nobody answered any question.

(2) Nobody answered a question.

(3) $\neg\exists x\exists y[\textsc{person}(x) \wedge \textsc{question}(y) \wedge \textsc{answer}(x,y)]$

The truth-conditions of the sentence in (1) could also be stated as in (4), where the *any* DP scopes over negation and contributes universal quantification.

(4) $\forall y[\textsc{question}(y) \rightarrow \neg\exists x[\textsc{person}(x) \wedge \textsc{answer}(x,y)]]$

Therefore, the interpretation of (1) could be due to either a narrow scope existential *any*

DP, as in (3), or a wide scope universal *any* DP, as seen in (4). However, as demonstrated in Ladusaw 1979, adopting the universal analysis of *any* DPs proves unfeasible. The interpretations in (3) and (4) are logically equivalent.[1] Yet, such equivalence does not hold in all cases. A clear distinction between the existential and universal analysis becomes apparent when examining the behavior of *any* DPs in other environments. An instance of this is found in cases involving the adverb of quantification *rarely*, which Ladusaw 1979 interprets as meaning 'usually not'.[2] For illustration, consider the sentence in (5). The narrow scope existential analysis predicts the reading expressed by (6-a), and the wide scope universal analysis the one in (6-b).

(5) The IRS rarely audited any cook last week. (based on Ladusaw (1979, p. 102))

(6) a. It is usually not the case that there is some cook whom the IRS audited last week. rarely $>$ $\exists$

b. Every cook is such that it is usually the case that the IRS didn't audit them last week. $\forall$ $>$ rarely

Now consider the scenario in (7). The reading in (6-a) is false in the scenario in (7), since whenever the IRS conducted an audit last week, they always audited a cook. On the other hand, the reading in (6-b) is true in the same scenario, since for every cook x, the IRS didn't audit x in 4 out of 5 audits. Given that the sentence in (5) is judged to be false in the scenario in (7), the narrow scope existential analysis yields an interpretation that matches the predicted truth-value, but the wide scope analysis doesn't. Therefore, this suggests an existential analysis of *any* DPs. For a detailed discussion along the lines of this argument, refer to Chapter 6.

(7) *Scenario*: There are five cooks ($\{c_1, \ldots c_5\}$). The IRS conducted five audits last

[1] (3) and (4) are logically equivalent because negations are 'anti-additive' functions (Zwarts, 1998), for which the equality in (i) holds. The equality in (i) says that the narrow scope disjunction with respect to function f is equivalent to the wide scope conjunction with respect to f.

(i) $f(A \vee B) = f(A) \wedge f(B)$

[2] See Chapter 6 for an explanation of why *rarely* is not anti-additive.

week, one audit per weekday. The cooks were the subject of these audits, with each audit involving a different cook. These five audits were the only audits conducted by the IRS last week.

So there are valid reasons to consider treating *any* DPs as existential quantifiers. Yet, when scoping under modals, *any* DPs convey meanings stronger than those of regular existentials. The sentence in (8-b) with an *any* DP requires *all* books to be permitted options for Mary to read. This requirement is known in the literature as a 'free choice' effect , and items, like *any* DPs, that trigger this effect are called free choice items (FCIs). The sentence in (8-b) can be paraphrased as 'for every book x, Mary can read x'.[3] In contrast, the counterpart of (8-b) with the regular existential *a*, given in (8-a), doesn't require all books to be permitted options. Hence, (8-b) is false in contexts where there is a book such that Mary is not allowed to read, while (8-a) is not.

(8) a. Mary can read a book.
b. Mary can read any book.

The interpretation that the sentence in (8-b) conveys cannot be ascribed to the lexical meaning of *any* DPs, since it disappears in some contexts. The deviance of following (9) with (10) illustrates this. In (9), *any* is interpreted under the scope of a sentential negation, a DE operator. If the free choice effect was truth conditional, (9) would convey that Mary is not allowed to read just any book, therefore, would be compatible with the continuation in (10) specifying that she is allowed to read a particular book. But (10) is incompatible with (9). Interpreting *any* as an existential quantifier under the scope of negation predicts the sentence in (9) to convey that there are no books that Mary can read. Under that interpretation, the sentence in (10) contradicts (9).

(9) Mary cannot read any book.

(10) #. . . she can read Ablomov.

[3] Menéndez-Benito 2005 argues that a more accurate paraphrase is : 'for every book x, Mary can read x and no other books'.

The distribution of *any* DPs is restricted. As shown above, *any* DPs are licensed in DE contexts (1) and in sentences containing a possibility modal (8-b), but not in positive episodic sentences (11) or in sentences containing a necessity modal (12).

(11) *Mary read any book.

(12) *Mary must read any book.

Based on their distribution and interpretation, the literature has identified two types of FCIs: Existential (EFCIs) and Universal (UFCIs) (Chierchia, 2013). German *irgendein* is an EFCI and English *any* a UFCI. EFCIs, like UFCIs, are licensed in DE contexts, where they are interpreted as a plain existential, and in sentences containing a possibility modal, where they trigger a free choice effect. Unlike UFCIs, EFCIs are licensed in sentences with a necessity modal and in positive episodic sentences. When scoping under necessity modals, *irgendein*, for instance, conveys existential force and triggers a free choice effect. The sentence in (13), as an example, makes the existential claim that Mary is required to marry a doctor, and additionally conveys that every doctor is a permitted option.

(13) Mary muss irgendeinen Arzt heiraten.
Mary has-to IRGENDEIN doctor marry
'Mary has to marry a doctor—any doctor.'

(Kratzer and Shimoyama, 2002, P. 11)

In unembedded sentences, EFCIs express a modal meaning component, either an *epistemic* modal component or an *agent indifference* meaning component (Alonso-Ovalle and Menéndez-Benito, 2015a). Some EFCIs like Spanish *algún* convey an epistemic modal component—they make an existential claim and convey that the speaker does not know which individual satisfies the claim. For instance, the sentence in (14) makes the existential claim that María married a doctor, and additionally conveys that the speaker does not know which doctor María married.

(14) María se casó con algún médico.
María se married with ALGÚN doctor
'María married some doctor or other.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

Others like Spanish *cualquiera* signal an agent indifference meaning component—they convey that the agent made a random choice. For instance, the sentence in (15) makes the existential claim that the agent bought a book, and additionally conveys that they made the choice at random, meaning that they could have bought any other book.

(15) Juan compró un libro cualquiera.
Juan bought UN book CUALQUIERA
≈ 'Juan bough a random book .'

(Alonso-Ovalle and Menéndez-Benito, 2018, p. 2)

What is behind the variable interpretation of FCIs and the contrast between them in their distribution? A line of research takes the attested interpretation in DE contexts as the baseline and derives the attested interpretation and distribution by assuming that sentences containing FCIs compete with alternative propositions which grammar uses to strengthen their basic existential meaning. The grammatical strengthening mechanism simply says that the proposition expressed by the sentences containing FCIs is true and every stronger alternative to them is false. An analysis along these lines was presented in Chierchia 2013.

According to the alternative and strengthening-based theory of FCIs developed in Chierchia 2013, FCIs are existential quantifiers. They introduce into the semantic derivation two types of propositional alternatives: (i) scalar alternatives and (ii) domain alternatives which must themselves get strengthened. These alternatives, scalar and strengthened ('pre-exhaustified') domain alternatives, need to be *obligatorily* factored into the meaning using a grammatical exhaustivity operator, which strengthens the basic existential assertion that FCIs make by excluding any alternatives that the basic assertion does not entail. This assumption explains both the distribution and interpretation of FCIs. In what follows, we will illustrate how the analysis derives the free choice effect

and the fact that FCIs are deviant when unembedded.

The two types of alternatives can be exhaustified separately via distinct exhaustivity operators, O_{σ} for scalar alternatives and $O_{\text{EXH-D}}$ for pre-exhaustified domain alternatives. The exhaustivity operator, which is responsible for strengthening, takes a proposition ϕ, and strengthens it by conjoining it with the negation of all the relevant alternative propositions to ϕ that are not entailed by ϕ, as defined in (16). For ease of exposition, we work with a single exhaustivity operator, O_{ALT}, to exclude the alternatives at once. While simplifying our discussion, this maintains the integrity of the result similar to the process when two separate exhaustivity operators consecutively exclude the alternatives, for the case discussed here.[4,5]

(16) $[\![O_{\text{ALT}}[\phi]]\!] = \lambda w.[\![\phi]\!](w) \wedge \forall p \in [\![\phi]\!]^{\text{x-ALT}}[p(w) \rightarrow [\![\phi]\!] \subseteq p]$

Let's provide an illustration. Consider the LF in (17-b) for the sentence in (11), repeated below in (17-a). The subscript $[+\sigma,+D]$ signals that both scalar and pre-exhaustified domain alternatives are 'active' and must be exhaustified. Assuming a domain of quantification which contains two books, $\{b_1, b_2\}$, the IP in (17-b) denotes the proposition in (17-c) which conveys that Mary read at least one book.[6]

(17) a. * Mary read any book.

b. LF: $O_{\text{ALT}}[_{\text{IP}}$ any$_{[+\sigma,+D]}$book $\lambda 1$ Mary read $t_1]$

c. $[\![[_{\text{IP}}$Mary read any book$_{[+\sigma,+D]}]]\!]$ = $b_1 \vee b_2$

As said before, FCIs introduce alternative meanings. The alternatives turn propositional by combining with the other constituents of a sentence via pointwise functional application. The scalar alternatives are determined by replacing the existential force of the FCI with universal force. The set of scalar alternatives to (17-c), in (18-a), contains the

[4] See Chapter 3 for an argument for using the two types of exhaustivity operators.

[5] We use different interpretation functions: $[\![.]\!]$ maps a linguistic expression to a semantic object; $[\![.]\!]^{\alpha\text{-ALT}}$ maps linguistic expressions to sets of semantic objects (alternatives), where $[\![.]\!]^{\sigma\text{-ALT}}$ is used for the scalar alternatives, $[\![.]\!]^{\text{D-ALT}}$ for the domain alternatives, and $[\![.]\!]^{\text{EXH-D-ALT}}$ for the so-called 'pre-exhaustified' domain alternatives.

[6] 'b_n' abbreviates the proposition that Mary read book$_n$.

single proposition that Mary read both books. The domain alternatives, given in (18-b), are determined by restricting the domain of quantification of the existential quantifier to subdomains of the original domain. The domain alternatives then must be strengthened, forming the pre-exhaustified domain alternatives, before getting factored into the meaning. Strengthening each domain alternative involves conjoining it with the negation of any other alternative in the set of domain alternatives that is 'innocently excludable'.[7] The relevant set of pre-exhaustified domain alternatives is given in (18-c).

(18) a. $[\![[_{\text{IP}}\ldots]]\!]^{\sigma\text{-ALT}}$ $\{b_1 \wedge b_2\}$

b. $[\![[_{\text{IP}}\ldots]]\!]^{\text{D-ALT}} =$ $\{b_1, b_2\}$

c. $[\![[_{\text{IP}}\ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

The scalar alternative, in (18-a), and the pre-exhaustified domain alternatives, in (18-c), are all stronger than the assertion in (17-c), therefore they need to be excluded, i.e negated. Excluding the scalar alternatives gives us the proposition in (19-a) which entails that one of the pre-exhaustified domain alternatives must be true.

(19) a. $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \Leftrightarrow (b_1 \wedge \neg b_2) \vee (b_2 \wedge \neg b_1)$

Negating the pre-exhaustified domain alternatives in (18-c) yields the propositions in (20), which, when conjoined, amounts to $b_1 \leftrightarrow b_2$ conveying that either Mary read both books, or that she didn't read any book. In conjunction with the assertion, this gives us the proposition in (21) entailing that the scalar alternatives must be true, which, in fact, contradicts the scalar implicature.

(20) a. $\neg(b_1 \wedge \neg b_2) \Leftrightarrow \neg b_1 \vee\ b_2 \Leftrightarrow b_1 \rightarrow b_2$

b. $\neg(b_2 \wedge \neg b_1) \Leftrightarrow \neg b_2 \vee\ b_1 \Leftrightarrow b_2 \rightarrow b_1$

(21) $(b_1 \vee b_2) \wedge (b_1 \leftrightarrow b_2) \Leftrightarrow b_1 \wedge b_2$

[7] A proposition q is an alternative to p that is innocently excludable, in case every way of conjoining p with as many negated alternatives to p as consistency with p allows for entails ¬q (Fox 2007; Alonso-Ovalle 2008).

Exhaustification with respect to both types of alternatives, therefore, leads to a contradiction, as (22) shows. This accounts for the deviance of unembedded sentences.

(22) $[\![(17\text{-b})]\!] = (b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \wedge (b_1 \leftrightarrow b_2) \Leftrightarrow \bot$

A modal intervening between the exhaustivity operator and the FCI will rescue the derivation of a contradiction. In such a case the free choice interpretation will emerge. For illustration, consider the sentence in (23), repeated from (13), with the LF in (24). ,

(23) Mary muss irgendeinen Arzt heiraten.
Mary has-to IRGENDEIN doctor marry
'Mary has to marry a doctor—any doctor.'

Assuming a domain with two doctors, $\{d_1, d_2\}$, the IP in the LF denotes the proposition in (25-a), that Mary is required to marry one of the two doctors, and contributes the scalar alternative, in (25-b), which conveys that Mary is required to marry both doctors. The domain alternatives and the strengthened version of them are given in (25-c) and (25-d), respectively. The alternatives, scalar alternative and pre-exhaustified domain alternatives, are stronger than the assertion in (25-a), therefore, they must be exhaustified. Exhaustification delivers the proposition in (25-e), that Mary is required to marry a doctor, and she is not required to marry both doctors, and that she is required to marry d_1 only if she is required to marry d_1. This entails the proposition that Marry is allowed to marry either doctor. Exhaustification, therefore, accounts for the attested free choice effect of FCIs in modal contexts.

(24) LF: $O_{ALT}\Box$ [$_{IP}$ irgendein doctor$_{[+\sigma,+D]}$ $\lambda 1$ Mary marry t_1]

(25) a. $[\![\Box[_{IP}\ldots]]\!] = \Box(d_1 \vee d_2)$

b. $[\![\Box[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \{\Box(d_1 \wedge d_2)\}$

c. $[\![\Box[_{IP}\ldots]]\!]^{\text{D-ALT}} = \{\Box d_1, \Box d_2\}$

d. $[\![\Box[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} = \{\Box d_1 \wedge \neg\Box d_2, \Box d_2 \wedge \neg\Box d_1\}$

e. $[\![O_{ALT}\Box[_{IP}\ldots]]\!] = \Box(d_1 \vee d_2) \wedge \neg\Box(d_1 \wedge d_2) \wedge (\Box d_1 \leftrightarrow \Box b_2)$
$\Leftrightarrow \Box(d_1 \vee d_2) \wedge \neg\Box(d_1 \wedge d_2) \wedge \Diamond d_1 \wedge \Diamond d_2$

1.2 Overview of the thesis

The preceding section outlined the defining characteristics of FCIs. FCIs, at their core, have existential semantics but trigger a free choice effect in modal contexts, conveying truth conditions stronger than those of plain existential DPs. Additionally, when unembedded, FCIs are either ungrammatical or convey a modal meaning component. Building upon this, my investigation shifts focus to DPs in Farsi, an Indo-Iranian language, which show some core properties of FCIs while also depart from them in significant ways.

Chapter 2 explores a variety of DPs in Farsi that trigger free choice effects, yet lack a detectable modal meaning component when unembedded. Instead, they convey a uniqueness meaning component, presenting a departure from typical FCIs.

In Chapter 3, our attention turns to the observation that this uniqueness meaning component embeds under modality, yielding theoretical implications.

Chapters 4 and 5 shed light on another type of DPs in Farsi, which, akin to FCIs, are existential at core and trigger free choice effects. However, these DPs lose their free choice effect when combined with specific morphology, highlighting a nuanced interplay between morphology and semantic interpretation. Furthermore, unlike their counterparts in other languages, these items display a more restricted scope.

Finally, in Chapter 6, we see another variety of DPs in Farsi, whose quantification force oscillates between existential and universal. While these DPs contribute existential force DE context, they convey universal force when unembedded.

By examining these patterns, I aim to provide insights into the semantics of DPs in Farsi and contribute to the growing cross-linguistic literature on FCIs. I will show that these patterns can be captured with the theory sketched earlier by addressing the following questions.

(26) a. Can the alternatives that FCIs activate ever be *deactivated*?
b. In which ways can the derivation of a contradiction be avoided?
c. What is the interplay between alternatives of different types? Are they independent?

d. Is the scope of the FCIs restricted?

e. What is the nature of the alternatives?

The rest of this chapter is organized as follows. Section 1.2.1 provides a short survey of quantificational DPs in Farsi. Section 1.2.2 offers an overview of the upcoming chapters of the thesis.

1.2.1 Farsi *-i* DPs

In Farsi, there are different forms of DPs that express existential quantification.

Bare NPs, which denote number neutral properties (Deal and Farudi, 2007; Modarresi and Simonenko, 2007), convey existential quantification, as shown in (27).

(27) Leili sib xarid.
Leili apple bought-3SG
'Leili bought an apple/apples.' (Krifka and Modarresi, 2016, p. 875)

Existential force can also be expressed through NPs marked with the enclitic *-i*, as seen in (28). In Farsi, the enclitic *-i* is used to mark indefiniteness.

(28) Ketab-i xarid-am.
book-IND bought-1SG
'I bought a book.' (Modarresi and Simonenko, 2007, p. 181)

Existential quantification can be expressed with the addition of determiners, too. The determiner *yek*[8] ('one') can be added to either bare NPs or to NPs marked with enclitic *-i*, and the result still conveys existential quantification, as the examples below illustrate. I call the former DPs '*yek* DPs', and the latter '*yek -i* DPs'.

(29) Ye ketab xarid-am.
one book bought-3SG
'I bought a book.'

[8]Farsi *yek* is realized as *ye* in the informal register. The Farsi data reported in this thesis come from the informal register. Our informants are native speakers of Tehrani Farsi, a dialect spoken in the Tehran province.

(30) Ye ketab-i xarid-am.
one book-IND bought-1SG
'I bought a book.' (Modarresi and Simonenko, 2007, p. 1)

Other determiners beyond *ye* can combine with NPs marked with enclitic *-i*. For instance, the determiner *har* can combine with NPs marked with enclitic *-i*. I call these DPs *'har -i* DPs'. In positive episodic sentences, as in (31), *har -i* DPs can have universal force: (31) conveys that Roya read *every* book that was on her desk.

(31) Roya har ketab-i ke roo miz-esh boode bashe xund-e.
Roya HAR book-IND that on table-POSS.3SG was SUBJ read-3.SG
'Roya read any book that was on her desk.'

Adding *hame* to NPs with enclitic *-i*, which forms DPs that I call *'hame -i* DPs', also conveys universal quantification, but this time over types of entities, as the translation of (32) hints at.

(32) Roya hame ketab-i xund.
Roya HAME book-IND read-3.SG
'Roya read all types of books.'

This thesis investigates the behavior of *yek -i* DPs, as in (30), which show core properties of EFCIs, *har -i* DPs, as in (31), which show core properties of UFCIs, and *hame -i* DPs, as in (32), that oscillate between existential and universal force, depending on the monotonicity properties of the environment that they are in.

1.2.2 Overview of the chapters

1.2.2.1 Contradiction-free strengthening via alternative pruning: Farsi *yek -i* DPs

The theoretical contribution of this chapter is to address the first two questions posed in (26), repeated below in (33).

(33) a. Can the alternatives that FCIs activate ever be *deactivated*?
b. In which ways can the derivation of a contradiction be avoided?

The chapter argues, on the basis of the behavior of Farsi *yek -i* DPs, that the alternatives that FCIs activate can be *partially* deactivated as a last resort strategy to avoid the derivation of a contradiction. Chapter 2 surveys the interpretation of *yek -i* DPs. It shows that they pattern with EFCIs in DE and modal contexts.

In DE contexts, *yek -i* DPs like other EFCIs, are interpreted as regular existentials, conveying a plain existential interpretation, as the translation of the sentence in (34), containing the Farsi counterpart of the DE propositional attitude verb *to doubt* shows.

(34) shak dar-am Forood ye film-i dide bash-e.
doubt have-1SG Forood one film-IND seen be-3SG
'I doubt that Forood has watched any movies.' doubt $>\exists$

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

When scoping under modals, either possibility or necessity modals, *yek -i* DPs, like other EFCIs, trigger a free choice effect. For instance, the sentence in (35) with a necessity modal requires every book to be a permitted option for Forood to buy. The deviance of following (35) with (36) which excludes a book as a permitted option, and therefore, is incompatible with free choice effect, shows this point.

(35) Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3SG
'Forood must buy a book — any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 6)

(36) ...#amma ne-mitun-e ketab-e b_1 o bexar-e)
...but NEG-can-3SG book-EZ b_1 ACC buy-3SG)
'...but he cannot buy b_1.'

In unembedded sentences, *yek -i* DPs depart from other EFCIs and, surprisingly, pattern with regular existentials. Unlike other EFCIs that are grammatical in unembedded sentences, where they convey modality, *yek -i* DPs have no detectable modal meaning component. Unlike other EFCIs, like Spanish *un NP cualquiera* and German *irgendein*, *yek -i* DPs do not convey agent indifference. The sentence in (38), for instance, while making

the existential claim that the agent bought a book, can felicitously describe the scenario in (37), because it does not convey that the agent bought it indiscriminately. The Spanish counterpart of (38) with *un NP cualquiera*, in contrast, would be false in (37).

(37) *Scenario* : Forood wanted to buy *The Iliad* and did so. He wouldn't have bought any other book. (38) = ✓

(38) Forood dirooz ye ketab-i xarid.
Forood yesterday one book-IND bought-3SG
'Forood bought a book yesterday.'

Unembedded *yek -i* DPs do not convey epistemic modality, either. Sentences containing a *yek -i* DP can be followed with a *namely* continuation naming an individual in the extension of the NP that satisfies the existential claim, as (39) illustrates. In contrast, other EFCIs, like *algún* and *irgendein*, do not allow for this type of continuation.

(39) Forood dirooz ye ketab-i xarid be esm-e Iliad.
Forood yesterday one book-IND bought-3SG to name-EZ Iliad
'Forood bought a book yesterday, namely *The Iliad*.'

(Alonso-Ovalle and Moghiseh, 2019a, P. 8)

Unembedded *yek -i* DPs simply contribute a uniqueness meaning component conveying that exactly one individual in the extension of the NP satisfies the existential claim. Hence, it would be odd for the addressee to ask 'how many?' after the sentence in (38). The loss of FCI status of *yek -i* DPs in unembedded sentences is puzzling. The goal in this chapter is to account for this puzzling case.

Under Chierchia's analysis of FCIs, once alternatives are active, they cannot be deactivated, but rather, they must be used up by an exhaustivity operator. In unembedded contexts, excluding both types of alternatives, as we saw with the LF in (17-b), leads to a contradiction. The derivation of a grammatical contradiction explains the deviance of UFCIs like *any* DPs in positive episodic sentences[9].

[9]See von Fintel 1993; Gajewski 2002; Chierchia 2013, among others, for the grammatical derivation of a contradiction as the basis for ungrammaticality.

The derivation of a contradiction also accounts for the behaviour of those EFCIs that, like *irgendein*, convey a modal meaning component in unembedded contexts. As illustrated in (24), with a modal intervening between between the exhaustivity operator and the FCI, exhaustification will yield a contingent proposition. The derivation of a contradiction can then be avoided by positing a covert necessity modal, as in (40-a), as a last resort strategy (Kratzer and Shimoyama, 2002; Chierchia, 2013). The argument of the exhaustivity operator in (40-a) makes the claim in (40-b). Under the epistemic reading of the necessity modal, conveys that Maria must have bought a book. The alternatives are not entailed by the assertion, and therefore they must be excluded. Excluding the alternatives, then, derives the contingent proposition in (41), which conveys that Maria must have bought a book and it is not the case that she must have bought both books and moreover that she must have bought b_1 only if, as far as the speaker knows, she bought b_2. This entails the proposition that Maria might have bought b_1 and she might have bought b_2. Exhaustification, therefore, derives the attested interpretation of EFCIs like *irgendein* that convey modality in unembedded contexts.

(40) a. LF: $O_{ALT}\Box[_{IP}$ irgendeinen$_{[+\sigma,+D]}$book $\lambda 1$ Maria bought $t_1]$

b. $[\![\ \Box[_{IP}\ldots]]\!] =$ $\Box(b_1 \vee b_2)$

c. $[\![\Box[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} =$ $\Box(b_1 \wedge b_2)$

d. $[\![O_\sigma\Box[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{\Box b_1 \wedge \neg\Box b_2, \neg\Box b_1 \wedge \Box b_2\}$

(41) $[\![$(40-a)$]\!] =$ $\Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2)$

$\Rightarrow \quad \Diamond b_1 \wedge \Diamond b_2 \wedge \Diamond\neg b_1 \wedge \Diamond\neg b_2$

Modal insertion, however, does not derive the behavior of *yek -i* DPs in unembedded sentences. In these contexts, *yek -i* DPs don't have any detectable modal component and instead they convey a uniqueness meaning component.

The chapter proposes that the behavior of *yek -i* DPs can be derived if (i) modal insertion is not a universally available strategy and (ii) some FCIs allow for a regulated deactivation of some of the alternatives that they introduce under the threat of the derivation of a contradiction, as a last resort strategy. For illustration, consider the Farsi

counterpart of the sentence in (42-a) and its LF in (42-b). As we have seen in unembedded sentences, excluding both the scalar and the pre-exhaustified domain alternatives leads to a contradiction.

(42) a. Forood bought ye book-i.

b. LF: $O_{ALT}[_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood bought t_1]

c. $[\![[_{IP}\ldots]]\!]$ = $b_1 \vee b_2$

d. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{b_1 \wedge b_2\}$

e. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

However, exhaustification with respect to either set, the scalar or the pre-exhaustified domain alternatives, yields a contingent proposition. Exhaustification with respect to the scalar alternative alone yields the proposition that Forood bought only one book, in (43-a), aligning with the attested meaning. Exhaustification with respect to the pre-exhaustified domain alternatives alone yields the coherent meaning that Forood bought both books, represented in (43-b). This, however, doesn't align with the attested meaning.

(43) a. $[\![O_\sigma[_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood bought $t_1]]\!]$ = $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)$

b. $[\![O_{\text{EXH-D}}[_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood bought $t_1]]\!]$ =

$((b_1 \vee b_2) \wedge (b_1 \leftrightarrow b_2)) \Leftrightarrow (b_1 \wedge b_2)$

If partial exhaustification— exhaustification with respect to either scalar or pre-exhaustified domain alternatives— is a possible strategy to avoid deriving a contradiction, it needs to be restricted to scalar alternatives. This is because only partial exhaustification with scalar alternatives yields the attested uniqueness meaning component of unembedded *yek -i* DPs. As seen in (43-b), partial exhaustification with the pre-exhasutified domain alternatives delivers a contingent proposition, but one that is equivalent to the scalar alternative, given in (42-d). Chapter 2 contends that partial exhaustification with respect to pre-exhaustified domain alternatives is ruled out on the basis of the Exhaustification Economy principle in Chierchia 2013, outlined in (44), which restricts exhaustification if

it delivers one of the grammatically determined alternatives.

(44) *Chierchia's Exhaustification Economy Principle*
Exhaustification is not allowed if it yields a meaning logically equivalent to one of the potential alternatives. (Chierchia, 2013, p.129)

1.2.2.2 Local exhaustification of scalar alternatives

Chapter 3 addresses the question in (26-c), repeated below in (45).

(45) What is the interplay between alternatives of different types? Are they independent?

This chapter argues that the two types of alternatives that FCIs introduce, the scalar and the pre-exhaustified domain alternatives, are independent and that they must be exhaustified separately via separate exhaustivity operators. This argument is based on the behavior of *yek -i* DPs under modals.

When interpreted under modals, *yek -i* DPs unlike other EFCIs, convey an embedded uniqueness meaning component. For illustration, consider the sentence in (46), repeated from (35), with a deontic necessity modal. On the narrow scope reading of the *yek -i* DP, the sentence, besides a free choice effect, triggers a uniqueness meaning component expressing that Forood is required to buy *one and only one* book: in all worlds compatible with what Forood is permitted to buy, he buys *exactly one* book. The observation is that following (46) with (47) is odd. The continuation in (47) simply conveys that the agent is allowed buy one or more than one, up to three books, and, therefore, contradicts what (46) conveys, that is the agent is not allowed to buy more than one book.

(46) Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3SG
'Forood must buy a book — any book.'

(47) . . . , # va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'# . . . and that he is allowed to buy at most three books.'

To explain the embedded uniqueness meaning component, I argue in this chapter that *yek -i* DPs require that the alternatives get exhaustified independently of the scalar ones obligatorily under modals.

1.2.2.3 Neutralizing Free Choice Items via Maximal Domain Restriction: Farsi *har -i* DPs

Chapter 4 turns to the question posed in (26-b), repeated below in (48).

(48) In which ways can the derivation of a contradiction be avoided?

This chapter proposes an alternative method, based on the behavior of Farsi *har -i* DPs, to avoid the derivation of a contradiction: neutralizing the alternatives via domain restriction. Chapter 4 shows that *har -i* DPs share the core properties of UFCIs.

Like other UFCIs, *har -i* DPs are deviant in positive episodic sentences, as in (49).

(49) *Roya har ketab-i xund.
Roya HAR book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

In sentences containing necessity modals, *har -i* DPs pattern with other UFCIs in that they are deviant, as (50) shows.

(50) *Roya bayad har ketab-i bexun-e.
Roya must HAR book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

In sentences containing possibility modals, *har -i* DPs just like other UFCIs, are licensed and convey a free choice effect requiring each individual in the extension of the NP to be a permitted option, as in (51).

(51) Roya mitun-e har ketab-i bexun-e.
Roya can-3.SG HAR book-IND read-3.SG
'Roya can read any book.' (Alonso-Ovalle and Moghiseh 2019b, p. 690)

We will see a puzzle: *har -i* DPs, as well as *yek -i* DPs, lose their FCI status when they combine with the accusative marker: they don't convey a free choice effect and they are licensed in contexts where they are ruled out in the absence of the accusative marker. In combination with *-ro*, *har -i* DPs are licensed in positive episodic sentences. The sentence in (52), for instance, is not deviant and conveys that Roya read all books in a certain group of books.

(52) Roya har ketab-i ro xund.
Roya each book-IND ACC read-3.SG
'Roya read each book (in a certain group of books).'

Under the scope of a necessity modal, *har -i* DPs are acceptable when marked with accusative marker *-ro*. The sentence in (53), for instance, is not deviant. It conveys that there is a certain group of books each of which Roya must read, not that Roya must read a book and that any book is a permitted option for her.

(53) Roya bayad har ketab-i ro bexun-e.
Roya must each book-IND ACC read-3.SG
'There is a certain group of books each of which Roya must read.'

When they combine with *-ro*, the free choice effect is not detectable in sentences containing a possibility modal. For instance, the sentence in (54) conveys that there is a certain group of books that Roya is allowed to read, not that she is allowed to read any book, as its counterpart without *-ro* in (51) does.

(54) Roya mitun-e har ketab-i ro bexun-e.
Roya can-3.SG each book-IND ACC read-3.SG
'There is a particular group of books each of which Roya can read.'

The chapter shows that the loss of FCI behavior follows from Chierchia's analysis under some assumptions about the semantic effect of the accusative marker in Farsi. For illustration, consider the LF in (55). In (55), we propose that *-ro* denotes a variable ranging over subset selection functions returning a singleton of the extension of the NP. The

assertion that the sister of O_{ALT} makes depends on the value of the singleton domain selection function.

(55) LF: O_{ALT} har [ro_i [book -i]] $\lambda 1$ [Roya read t_1]

Assume a domain with three books ($\{b_1, b_2, b_3\}$). Suppose that the singleton domain contains the atomic individual b_1. As noted before, *har -i* DPs require at least one plural individual in the extension of the NP to have the VP property. The proposition in (56) conveys that there is a plural individual x in $\{b_1\}$ that Roya read. The domain doesn't contain any plural individual, the proposition, thus, is a contradiction. Therefore, propositions expressed based on singleton subsets containing atomic individuals are deemed implausible assertions.

(56) $\lambda w.\exists x[x \in \{b_1\} \wedge \textsc{plural}(x) \wedge \textsc{read}_w(R, x)]$

Moving on to the second possibility, there are four singleton subsets of the original domain that passes the plurality requirement of the *har -i* DPs, given in (57). Suppose that the singleton domain selection function returns the singleton subset containing the plural individual $b_1 \oplus b_2$. At the assertion level, the argument of the exhaustivity operator in (55) denotes the propositions in (58).

(57) $\{b_1 \oplus b_2\}, \{b_1 \oplus b_3\}, \{b_2 \oplus b_3\}, \{b_1 \oplus b_2 \oplus b_3\}$

(58) $\lambda w.\exists x[x \in \{b_1 \oplus b_2\} \wedge \textsc{plural}(x) \wedge \textsc{read}_w(R, x)]$

We now move on to the alternatives. As noted before, the domain alternatives result from restricting the domain to any of its subsets. Because the domains are already singleton sets, the only possible subdomains to consider are improper subdomains which are equivalent to the domains in (57). Therefore, the domain alternative for the assertion in (58), for instance, would be equivalent to the assertion itself. Furthermore, since, for each possible assertion, there is only one domain alternative, there will be one pre-exhaustified domain alternative, which would be equivalent to the domain alternative, and accordingly, to the assertion, as seen in (59).

(59) $\{\lambda w.\exists x[x \in \{b_1 \oplus b_2\} \wedge \textsc{plural}(x) \wedge \textsc{read}_w(R,x)]\}$

Because the domains are restricted to singletons, for each possible assertion, the corresponding scalar alternatives will also be equivalent to the assertion itself, as exemplified in (60).

(60) $\lambda w.\forall x[x \in \{b_1 \oplus b_2\} \rightarrow \textsc{read}_w(R,x)]$

For each possible assertion, then, both scalar and pre-exhaustified domain alternatives are equivalent to the assertion itself, and therefore, they are non-excludable. Consequently, in the LF in (55), exhaustification becomes vacuous, merely resulting in the argument of O_{ALT}. Related to the question in (48), this chapter illustrates that neutralizing the alternatives is a viable means to avoid deriving a contradiction.

1.2.2.4 Obligatory wide scope: Farsi *har -i* DPs

Chapter 5 answers the question posed in (26-d), repeated below in (61).

(61) Is the scope of the FCIs restricted?

On the basis of the behavior of *har -i* DPs, the chapter argues that the scope of FCIs is restricted. In particular, Farsi *har -i* DPs cannot scope under modals.

We know from previous discussions that EFCIs and UFCIs contrast under the scope of necessity modals. EFCIs are licensed and trigger a free choice effect, whereas UFCIs are deviant in such contexts. To explain this contrast, Chierchia 2013 assumes that UFCIs, in contrast to EFCIs, must scope over modals. With the wide scope construal of FCIs, exhaustification always results in a contradiction with necessity modals, because it replicates the effect of exhaustification in unembedded sentences. To illustrate this point, consider (62-a). The assertion in (62-b), together with the negated pre-exhaustified domain alternatives in (62-d), the third conjunct in (62-e), conveys that Mary reads all book in *all* permitted worlds. This contradicts the negated scalar alternative in (62-c), the second conjunct in (62-e), which conveys that Mary does not read all books in all permitted

worlds, as highlighted in (62-e).

(62) a. LF: $O_{ALT}[_{IP}$ any$_{[+\sigma,+D]}$book $\lambda 1$ $\Box$ [Mary read t_1]]

b. $[\![[_{IP}\ldots]]\!]$ = $\Box b_1 \vee \Box b_2$

c. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{\Box b_1 \wedge \Box b_2\}$

d. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{\Box b_1 \wedge \neg\Box b_2, \Box b_2 \wedge \neg\Box b_1\}$

e. $[\![$(62-a)$]\!]$ = $(\Box b_1 \vee \Box b_2) \wedge \neg(\Box b_1 \wedge \Box b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2) \Leftrightarrow \bot$

As reported in the literature, UFCIs combined with numerals, like '*any two books*', unlike their counterparts without numerals, are licensed with necessity modals and trigger a free choice effect (Dayal 2005, 2013; Chierchia 2013). The sentence in (63), for instance, claims that Mary must read two books and that every two books is a permitted option.

(63) Mary must read any two books.

To capture the contrast between UFCIs and their numeral counterparts, Chierchia posits that the numeral component prompts the wide scope construal to be violated while permitting the narrow scope construal. As for the question in (61), Chierchia hypothesizes that FCIs, by default, take scope over modals. However, when these items belong to a scale comprising more than two members, like numerals which form a scale of the form $<$one, two, three,$\ldots>$, they take scope under modals. This applies to items that are associated with numeric scale, like EFCIs and the numeral counterparts of UFCIs.

Chapter 5 expands the empirical investigation to Farsi, revealing that the contrast observed between UFCIs and their numeral counterparts might not universally hold. The presence of the numeral component does not affect the distribution of *har -i* DPs: *har -i* DPs, which pattern with other UFCIs, and their numeral counterpart ('numeral *har*') pattern alike. Unlike numeral *any*, but just like plain *any* DPs and *har -i* DPs, numeral *har* is deviant in sentences containing a necessity modal, as (334) shows.

(64) * Roya bayad har do ta ketab-i bexun-e.
Roya must HAR two CL book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2021, p. 488)

To explain this contrast, Chapter 5 proposes that *har -i* DPs do not tolerate scoping under modals.

1.2.2.5 Universal force from exhaustification: Farsi *hame -i* DPs

To answer the question posed in (26-e), repeated below in (65), Chapter 6 focuses on *hame -i* DPs, whose interpretation, just like FCIs, is sensitive to the environments in which they occur.

(65) What is the nature of the alternatives?

The chapter proposes that *hame -i* DPs introduce domain alternatives, but not scalar alternatives. Farsi *hame -i* DPs quantify over types. The quantificational force of *hame -i* DPs oscillates between existential and universal.

In positive episodic sentences, *hame -i* DPs convey universal force. For instance, the sentence in (66) claims that for each (contextually relevant) type of (contextually relevant) hole P, Forood fell in a hole of type P.

(66) Forood too hame chale-i oftad.
Forood in hame hole-IND fell.3SG
'Forood fell in all types of holes.'

In DE contexts, *hame -i* DPs can contribute existential force. The sentence in (67), for instance, can convey that the speaker wins the bet as soon as Forood falls in some type of hole or other.

(67) Age Forood too hame chale-i bioft-e, shart ro mibar-am.
if Forood in hame hole-IND fall-3SG, bet ACC win-1SG
'If Forood falls in *hame* hole-*i*, I win the bet.'

To capture the oscillation in quantificationl force of *hame -i* DPs, this chapter argues that *hame -i* DPs are existential quantifiers that trigger domain but not scalar alternatives. For a brief illustration, consider the LF in (68-a) for the sentence in (66). Assuming a domain containing two types of holes ($\{h_1, h_2\}$), the argument of the exhaustivity operator

denotes the disjunction in (68-b) (where f_n stands for the proposition that Forood fell in hole of type h_n), and contributes the pre-exhaustified domain alternatives in (68-c). Excluding the alternatives yields the universal claim in (68-d), matching the attested interpretation.

(68) a. LF: $O_{ALT}[_{IP}$ hame hole-$i_{[+D]}$ $\lambda 1$ Forood fell in $t_1]$

b. $[\![[_{IP}\ldots]]\!] =$ $f_1 \vee f_2$

c. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{f_1 \wedge \neg f_2, f_2 \wedge \neg f_1\}$

d. $[\![$(68-a)$]\!] =$ $(f_1 \vee f_2) \wedge (f_1 \leftrightarrow f_2) \Leftrightarrow f_1 \wedge f_2$

1.2.2.6 Conclusion

Finally, Chapter 7 concludes with a brief summary of the thesis.

Chapter 2

Contradiction-free strengthening via alternative pruning: Farsi *yek -i* DPs

2.1 Introduction

EFCIs, like German *irgendein*, are quantificational DPs that are interpreted as an existential quantifier in DE contexts, where they are grammatical. For instance, the sentence in (69), using *irgendein*, conveys that no question was answered, similar to its English counterpart using a regular existential, in (70).

(69) Niemand hat irgendeine Frage beantwortet.
Nobody has IRGENDEINE question answered
'Nobody answered a question.' (Aloni and Port, 2015, p. 121)

(70) Nobody answered a question.

But when they scope under a modal, EFCIs convey meanings that are stronger than those of regular existentials. For illustration, consider the pair of German sentences in (71). Both sentences convey that Mary is required to marry a doctor. However, while the sentence in (71-a) with the regular existential *ein* can felicitously describe a scenario where not all doctors are permitted options for Mary to marry, its counterpart in (71-b) with *irgendein* cannot: (71-b) requires all doctors to be permitted options. This requirement is known in the literature as a free choice effect , and items, like *irgendein*, that

trigger this effect are called EFCIs.

(71) a. Mary muss einen Arzt heiraten.
Mary has-to EIN doctor marry
'Mary has to marry a doctor.'

b. Mary muss irgendeinen Arzt heiraten.
Mary has-to IRGENDEIN doctor marry
'Mary has to marry a doctor—any doctor.'

(Kratzer and Shimoyama, 2002, P. 11)

Different varieties of EFCIs have received attention in the semantics literature. Moving beyond German *irgendein* (Kratzer and Shimoyama 2002; Aloni 2007b, 2012; Lauer 2010; Aloni and Port 2015), these include Spanish *algún* (Alonso-Ovalle and Menéndez-Benito 2010, 2011, 2015a) and *un NP cualquiera* (Alonso-Ovalle and Menéndez-Benito 2013, 2018), Italian *un NP qualsiasi* (Chierchia 2013; Aloni and van Rooij 2007) and *un qualche* (Zamparelli 2007; Chierchia 2013; Aloni and Port 2015), Romanian *vreun* and *un oarecare* (Fălăuş 2014, 2015; Farkas 2006), French *un NP quelconque* (Jayez and Tovena 2002, 2006), Greek *kapjos* (Giannakidou and Quer 2013), Sinhala *wh-də* and *wh-hari* (Slade 2015), the Chinese *wh*-words (Chierchia and Liao 2015), and Czech *-si* (Šimík 2013).

The empirical investigation of EFCIs revealed a contrast between these items with respect to their behavior in unembedded sentences. There are two possibilities. Some EFCIs, like Romanian *vreun*, are ungrammatical in unembedded sentences (Fălăuş, 2014), as (72) shows.

(72) *Monica s-a întâlnit cu vreun prieten.
Monica REFL-have.3SG met with VREUN friend.MASC
'Monica met a friend.' (Fălăuş, 2014, p. 122)

In contrast, other EFCIs are grammatical in unembedded sentences and convey a modal meaning component (Alonso-Ovalle and Menéndez-Benito, 2015b). Cross-linguistically, these items can convey two types of modal meaning components, an *epistemic* modal component or an *agent indifference* meaning component (Alonso-Ovalle and Menéndez-Benito, 2015a). Some EFCIs convey an epistemic modal component—they make an exis-

tential claim and convey that the speaker does not know which individual satisfies the claim. Examples of this type of EFCI include *algún* (Alonso-Ovalle and Menéndez-Benito 2015a), *irgendein* (Kratzer and Shimoyama 2002; Aloni and Port 2015), and *un qualche* (Chierchia 2013; Aloni and Port 2015), among others. To illustrate, the sentence in (73), with Spanish *algún*, makes the existential claim that María married a doctor, and additionally conveys that the speaker does not know which doctor María married. Therefore, it cannot be felicitously followed with a *namely* continuation naming the individual that satisfies the existential claim, as (74) shows.

(73) María se casó con algún médico.
María se married with ALGÚN doctor
'María married some doctor or other.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

(74) María se casó con algún médico, (# en concreto con el Dr. Smith.)
María se married with ALGÚN doctor, in particular with the Dr. smith
'María married some doctor or other, namely Dr. Smith.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

Others, like *un NP cualquiera* (Alonso-Ovalle and Menéndez-Benito 2018), *irgendein* (Kratzer and Shimoyama 2002; Buccola and Haida 2017), and *un NP qualsiasi* (Chierchia 2013), among others, signal an *agent indifference* meaning component—they convey that the agent made a random choice. This is illustrated by the sentences in (75), with *cualquiera*, and (76), with *irgendein*. These sentences make the existential claim that the agent bought a book, and additionally convey that they made the choice at random, i.e. that they could have bought any other book. Some EFCIs, like *irgendein*, can convey this type of modality as well as epistemic modality (Kratzer and Shimoyama 2002; Buccola and Haida 2017).

(75) Juan compró un libro cualquiera.
Juan bought UN book CUALQUIERA
≈ 'Juan bough a random book .'

(Alonso-Ovalle and Menéndez-Benito, 2018, p. 2)

(76) Hans hat irgendein Buch gekauft.
Hans has *irgendein* book bought
≈ 'Hans bought a random book.' (Buccola and Haida, 2017, p. 165)

In this chapter, we show the existence of a third possibility, which seems to pose a challenge to the current theories of EFCIs. We probe into the interpretation and distribution of Farsi *yek -i* DPs, which are formed by adding the determiner *yek* ('one') to NPs marked with enclitic *-i*, as in (77).

(77) Ye ketab-i xarid-am.
one book-IND bought-1SG
'I bought a book.' (Modarresi and Simonenko, 2007, p. 1)

Yek -i DPs share some core characteristics of EFCIs. In DE contexts, *yek -i* DPs are interpreted like regular existentials, conveying a plain existential interpretation. This is illustrated by the sentence in (78), which contains the Farsi counterpart of the DE propositional attitude verb *to doubt*. The sentence in (78) conveys that the speaker doubts that Forood has watched any movies.

(78) shak dar-am Forood ye film-i dide bash-e.
doubt have-1SG Forood one film-IND seen be-3SG
'I doubt that Forood has watched any movies.' doubt $>\exists$
(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

When scoping under modal operators, *yek -i* DPs, like other EFCIs, trigger interpretations that are stronger than those that regular existentials trigger. For illustration, consider the sentences in (80) which make an existential claim conveying that Forood is required to buy a book. We can see that the two sentences differ in their interpretation with the help of the scenario in (79). The sentence in (80-a) with the regular indefinite *yek* DPs, formed by adding *yek* to bare NPs, can felicitously describe the scenario. The sentence in (80-b) with a *yek* DP, in contrast, is false in the same scenario because it requires all books to be permitted options.

(79) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Forood is required to buy a book and he is allowed to buy b_1, he is allowed to buy b_2, and he is allowed to buy b_3, but he is not allowed to buy b_4 or b_5.

(80-a) = ✓, (80-b) = ✗

(80) a. Forood bayad ye ketab bexar-e.
Forood must one book buy-3SG
'Forood must buy a book.'

b. Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3SG
'Forood must buy a book — any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 6)

While *yek -i* DPs pattern with other EFCIs in DE and modal contexts, they contrast with all other EFCIs in unembedded contexts, and pattern with regular existentials. First, *yek -i* DPs are grammatical when unembedded. In this, they contrast with Romanian *verun*. Second, unembedded *yek -i* DPs have no detectable modal meaning component, unlike the other EFCIs that are grammatical when unembedded.

In unembedded contexts, *yek -i* DPs do not convey agent indifference. For instance, the sentence in (82), which makes an existential claim that the agent bought a book, can felicitously describe the scenario in (81). If *yek -i* DPs could convey agent indifference, the sentence in (82) would be deviant in the scenario in (81). The Spanish counterpart of (82) with *un NP cualquiera*, in contrast, would be false in (81).

(81) *Scenario* : Forood wanted to buy *The Iliad* and did so. He wouldn't have bought any other book. (82)= ✓

(82) Forood dirooz ye ketab-i xarid.
Forood yesterday one book-IND bought-3SG
'Forood bought a book yesterday.'

Unembedded *yek -i* DPs do not convey epistemic modality, either. Unlike other unembedded EFCIs which convey epistemic modality, like *algún*, *yek -i* DPs allow *namely* continuations naming an individual in the extension of the NP that satisfies the existential

claim, as (83) illustrates.

(83) Forood dirooz ye ketab-i xarid be esm-e Iliad.
Forood yesterday one book-IND bought-3SG to name-EZ Iliad
'Forood bought a book yesterday, namely *The Iliad*.'

(Alonso-Ovalle and Moghiseh, 2019a, P. 8)

In unembedded sentences, *yek -i* DPs simply contribute a uniqueness meaning component conveying that exactly one individual in the extension of the NP satisfies the existential claim.

Conveyance of a modal component in unembedded sentences is the hallmark of all EFCIs that are grammatical in such sort of sentences. The lack of this meaning with unembedded *yek -i* DPs is surprising and, at the same time, raises a question: what lies behind the contrast between unembedded *yek -i* DPs and other EFCIs? The main goal of this chapter is to answer this question. To do so, we provide a formal account of *yek -i* DPs, adopting the alternative- and exhaustification-based theory of FCIs developed in Chierchia 2013, as the basic framework. The second goal is to contribute to a line of research that aims to identify possible cross-linguistic variations among EFCIs.

Adopting Chierchia's theory of FCIs, *yek -i* DPs are taken to be existential quantifiers that introduce alternatives into their semantic derivation. These alternatives must be obligatorily exhaustified. We will see that exhaustification derives the behavior of *yek -i* DPs in modal and DE contexts, since *yek -i* DPs do not differ form other EFCIs in these contexts. With respect to the behavior of *yek -i* DPs in unembedded sentences, we argue that the absence of modal meaning component is accounted for by imposing a requirement on the alternatives that *yek -i* DPs introduce which allows for alternative pruning when exhaustification yields a contradiction.

The rest of the chapter is organized as follows. First, in Section 2.2, we survey the distribution and interpretation of *yek -i* DPs, which reveals a puzzle: *yek -i* DPs, which pattern with other EFCIs in DE contexts and in modal contexts, lose their FCI status when they appear in unembedded sentences. Then, Section 2.3 sets out the preliminaries of the adopted framework, the alternative-based theory of FCIs developed in Chierchia

(2013), which argues that EFCIs introduce alternatives which must be obligatorily factored in the meaning. We will see in that section that Chierchia's theory, as expected, can capture the behavior of *yek -i* DPs in modal and DE contexts, where they pattern with other EFCIs. Section 2.4 focuses on the behavior of *yek -i* DPs in unembedded sentences, where, as we have seen, these DPs depart from other EFCIs.. We will see that the behavior can be accounted for if we assume the possibility of alternative pruning under certain conditions. In Section 2.5, we get back to the contrast between epistemic modals and deontic modals. Section 2.6 concludes.

2.2 The Puzzle: Loss of free choice item status

This section presents a puzzle by focusing on the behavior of Farsi *yek -i* DPs. We provide in detail the interpretation and distribution of *yek -i* DPs. We show that, as anticipated above, *yek -i* DPs pattern with EFCIs in DE contexts (Section 2.2.1) and in modal contexts (Section 2.2.2), but depart from other EFCIs in that that they do not convey modality in unembedded contexts (Section 2.2.3). We conclude the empirical investigation with the claim that *yek -i* DPs seem to represent a new profile of EFCIs (Section 2.2.4). Then, we show that the modal inferences of *yek -i* DPs embedded under modals and their uniqueness meaning component are both derived via competition with stronger alternatives (Section 2.2.5). Finally, we provide a summary of the discussion (Section 2.2.6).

2.2.1 Downward entailing contexts

Like Spanish *algún* or German *irgendein*, but unlike Italian *un NP qualsiasi*, *yek -i* DPs are felicitous in DE contexts, where they contribute narrow scope existential force. For instance, the sentence in (84), repeated from (78), conveys that the speaker doubts that Forood has watched a movie and (85) conveys that Forood will a get gift if he reads at least one book.

(84) shak dar-am Forood ye film-i dide bash-e.
doubt have-1SG Forood one film-IND seen be-3SG
'I doubt that Forood has watched any movies.' doubt $>\exists$

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

(85) age Forood ye ketab-i bexun-e, ye jaize migir-e.
if Forood one book-IND read-3SG one gift take-3SG
'If Forood reads a book, he gets a gift.' if [. . . $\exists$ . . .] then . . .

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

Yek -i DPs show restrictions in the type of DE contexts that they can appear in. Like *algún*, as in (87), or *irgendein*, as seen in (88), *yek -i* DPs cannot be interpreted under sentential negation, as (86) shows.[10]

(86) *Forood ye ketab-i na-xarid.
Forood one book-IND NEG-bought-3SG
'Forood did not buy any book.' *$\neg >\exists$

(87) *No he leído algún libro.
not have read ALGÚN book
'I have not read any books.'

(88) *Ich hab nicht irgendein Buch gelesen.
I have not IRGENDEIN book read
'I didn't read any book.' (Chierchia, 2013, p. 250)

2.2.2 Modal contexts

Yek -i DPs are grammatical when they scope under modals. Like *algún* or *irgendein*, but unlike *vreun*, *yek -i* DPs do not show restrictions with respect to the type of modals that they can combine with. They are grammatical under deontic modals, as in (89-a), with a possibility modal, and, as seen in (89-b), with a necessity modal.

[10] If *irgendein* is focused, (88) is interpreted as 'I didn't read just any book' (Kratzer and Shimoyama, 2002). This reading, in contrast, is not available for (87) and (86).

(89) a. Forood mitun-e ye ketab-i bexar-e.
Forood can-3SG one book-IND buy-3SG
'Forood can buy a book—any book.'

b. Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3SG
'Forood must buy a book and he can buy any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

Likewise, *yek -i* DPs are grammatical under epistemic modals, as in (90-a), with a possibility modal, and, as seen in (90-b), with a necessity modal.

(90) a. Forood mitun-e ye ketab-i xarid-e bash-e.
Forood can-be ye book-IND bough-3SG be-3SG
'Forood might have bought a book.'

b. Forood bayad ye ketab-i xarid-e bash-e.
Forood must one book-IND buough-3SG be-3SG
'Forood must have bought a book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 6)

EFCIs differ, not only with respect to the type of modals they allow for, but also with respect to the inferences that they trigger when embedded under modals. As pointed out, some EFCIs, like *irgendein*, trigger a free choice effect requiring total variation between the individuals in the domain of quantification. This conveys that *each* individual in the extension of the NP is a possibility. For instance, the sentence in (91) with *irgendein* interpreted under the modal requires every doctor to be a permitted option for Mary to marry. Hence, the sentence is deviant in scenarios where not all doctors are permitted options. Other EFCIs, like *algún*, trigger a weaker inference, a 'modal variation' effect (von Fintel, 2000; Alonso-Ovalle and Menéndez-Benito, 2010), requiring partial variation between the individuals in the domain. This requires that there be *at least two* individuals in the extension of the NP that satisfy the existential claim. For instance, the sentence in (92) with *algún* scoping under the modal, requires at least two doctors to be permitted options for María to marry. Hence, the sentence can felicitously describe scenarios where not all doctors are permitted options.

(91) Mary muss irgendeinen Arzt heiraten.
Mary has-to IRGENDEIN doctor marry
'Mary has to marry a doctor—any doctor.'

(Kratzer and Shimoyama, 2002, P. 11)

(92) María tiene que casarse con algún médico.
María has to marry with ALGÚN doctor
'Mary has to marry some doctor or other.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 10)

We now move on to the interpretations that *yek -i* DPs trigger when they scope under deontic modals (Section 2.2.2.1) and epistemic modals (Section 2.2.2.2).

2.2.2.1 *Yek -i* DPs with deontic modals

When scoping under deontic modals, both possibility and necessity modals, *yek -i* DPs differ from Farsi regular existential *yek* DPs in that they convey a free choice effect, like *irgendein*, but unlike *algún*. For illustration, consider the scenario in (93) where not all books are permitted options. The sentence in (94) with the regular indefinite *yek* DP under a possibility modal can felicitously describe the scenario in (93). In contrast, its counterpart with a *yek -i* DP, as in (95), repeated from (89-a), cannot, because it conveys that Forood is allowed to buy any of the five books. If *yek -i* DPs were just contributing an existential force under the scope of the possibility modal, as *yek* DPs do, the sentence in (95) would be true in the scenario in (93), as (94) is.

(93) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Forood is allowed to buy b_1, he is allowed to buy b_2, and he is allowed to buy b_3, but he is not allowed to buy b_4 or b_5. (94) = ✓, (95) = ✗

(94) Forood mitun-e ye ketab bexar-e.
Forood can-3SG one book buy-3SG
'Forood can buy a book.' (Alonso-Ovalle and Moghiseh, 2019a, p. 6)

(95) Forood mitun-e ye ketab-i bexar-e.
Forood can-3SG one book-IND buy-3SG
'Forood can buy a book — any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 6)

This observation can be further supported by the following pair of examples. A continuation incompatible with free choice effect is consistent with *yek* DPs, as in (96), but inconsistent with *yek -i* DPs, as the deviance of (97) shows.

(96) Forood mitun-e ye ketab bexar-e, (amma ne-mitun-e ketab-e b_1 o
Forood can-3SG one book buy-3SG, (but NEG-can-3SG book-EZ b_1 ACC
bexar-e)
buy-3SG)
'Forood can buy a book, but he cannot buy b_1.'

(97) Forood mitun-e ye ketab-i bexar-e, (# amma ne-mitun-e ketab-e b_1 o
Forood can-3SG one book-IND buy-3SG, (but NEG-can-3SG book-EZ b_1 ACC
bexar-e)
buy-3SG)
'Forood can buy any book, but he cannot buy b_1.'

(Alonso-Ovalle and Moghiseh, 2019a, P. 6)

When scoping under deontic necessity modals, *yek -i* DPs trigger a free choice effect as they do under deontic possibility modals. To see that this is the case, consider the scenario in (98). The sentence in (99) with the regular existential *yek* DP is true in the scenario in (98) where not all books are permitted options. In contrast, the counterpart of (99) with a *yek -i* DP in (100), repeated from (80-b), is false because it requires all books to be permitted options. The sentence in (100) conveys that Forood is required to buy a book, and, additionally, that any book is a permitted option for him to buy.

(98) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Forood is required to buy a book and he is allowed to buy b_1, b_2, and b_3, but he is not allowed to buy b_4 or b_5.

(99) = ✓, (100) = ✗

(99) Forood bayad ye ketab bexar-e.
Forood must one book buy-3SG
'Forood must buy a book.' (Alonso-Ovalle and Moghiseh, 2019a, P. 7)

(100) Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3SG
'Forood must buy a book–any book.'
(Alonso-Ovalle and Moghiseh, 2019a, P. 7)

Likewise, following (100) with a continuation that excludes some books as permitted options, and therefore, is incompatible with free choice effect, leads to a contradiction, as (102) shows. In contrast, the counterpart of (102) with a *yek* DP is perfectly consistent, as (101) shows.

(101) Forood bayad ye ketab bexar-e, (amma ne-mitun-e ketab-e b_1 o
Forood must one book buy-3SG, (but NEG-can-3SG book-EZ b_1 ACC
bexar-e)
buy-3SG)
'Forood must buy a book, but he cannot buy b_1.'

(102) Forood bayad ye ketab-i bexar, (# amma ne-mitun-e ketab-e b_1 o
Forood must one book-IND buy-3SG, (but NEG-can-3SG book-EZ b_1 ACC
bexar-e)
buy-3SG)
'Forood must buy a book, any book, but he cannot buy b_1.'

From these examples, we conclude that when *yek -i* DPs scope under deontic modal, they trigger a free choice effect requiring each individual in the extension of the NP to be a possibility.

2.2.2.2 *Yek -i* DPs with epistemic modals

When scoping under epistemic modals, like *irgendein* or *un qualche*, but unlike *un qualsiasi*, (Aloni and Port, 2015; Chierchia, 2013), *yek -i* DPs do not require all individuals in the extension of the NP to be possibilities, that is, they do not trigger a free choice effect. Instead, they trigger a weaker inference than free choice effect: they trigger a modal

variation effect requiring that at least two individuals in the extension of the NP be possibilities. For instance, the sentence in (104), with a *yek -i* DP taking narrow scope below an epistemic possibility modal, can felicitously describe the scenario in (103) which make it clear that not all but at least two books are possible options.

(103) *Scenario:* There are only five books ($\{b_1 \ldots b_5\}$). The speaker is convinced that Forood hasn't bought b_4 or b_5, but for all he knows, Forood could buy any of the other books, or even none of the books. (104) = ✓

(104) Forood mitune-e ye ketab-i xarid-e bash-e.
Forood can-be ye book-IND bough-3SG be-3SG
'Forood might have bought a book.'

If *yek -i* DPs required that all individuals in the extension of the NP be possibilities when scoping under epistemic modals, the sentence in (104) would be judged false in the scenario in (103). However, the sentence is true. We can see the same point with the help of the felicitous discourse in (105), which is incompatible with free choice.

(105) Forood mitun-e ye ketab-i xarid-e bash-e. Amma ketab-e b_1 o
Forood can-be ye book-IND bough-3SG be-3SG. But book-EZ b_1 ACC
na-xarid-e.
NEG-bought-3SG
'Forood might have bought a book. But, he hasn't bought b_1.'

The modal variation effect is also detectable when *yek -i* DPs take narrow scope under an epistemic necessity modal. The sentence in (90-b), repeated below in (107), for instance, is a felicitous description of the scenario in (106), where there are at least two books that Forood could buy, and can be continued with a sentence that excludes some of the epistemically possible options, as (108) shows.

(106) *Scenario:* There are only five books ($\{b_1 \ldots b_5\}$). The speaker is convinced that Forood has bought a book, but knows that he hasn't bought b_4 or b_5. (107) = ✓

(107) Forood bayad ye ketab-i xarid-e bash-e.
Forood must one book-IND buough-3SG be-3SG
'Forood must have bought a book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 6)

(108) Forood bayad ye ketab-i xarid-e bash-e. Amma ketab-e b_1 o
Forood must one book-IND buough-3SG be-3SG. But book-EZ b_1 ACC
na-xarid-e.
NEG-bought-3SG
'Forood must have bought a book. But, he hasn't bought b_1'

These examples lead us to conclude that *yek -i* DPs trigger a modal variation effect requiring at least two individuals in the extension of the NP to be a possibility, when they scope under epistemic modals.

In short, *yek -i* DPs pattern with other EFCIs in downward entailing and modal context. However, as we will see in Section 2.2.3, they depart from other EFCIs in unembedded sentences.

The previous literature has not classified *yek -i* DPs as FCIs, most likely because they did not investigate the behavior of these items in modal contexts. There are however hints about their status as EFCIs in previous work. For instance, Jasbi (2016) shows that *yek -i* DPs impose an anti-singleton constrain on the extension of their NP: the extension of their NP must contain more than one entity. The example in (109), from Jasbi 2016, makes the point: the conditional in (109-b) is deviant because the *yek -i* DPs in its antecedent ranges over a singleton domain.

(109) a. *Scenario:* Mr. and Ms. Karimi have two daughters and a son. In this family, ...

b. # age ye pesar-i ezdevaj kon-e, pesar-e mojarad na-dar-im.
if one boy-IND marry do-3SG, boy-EZ single NEG-have-1PL
'If a son marries, then we won't have any single son.' (Jasbi, 2016, p. 249)

If *yek -i* DPs are EFCIs, the anti-singleton constraint is in fact expected: if the extension of the NP were a singleton, there would be no modal inference, since modal inference require that at least two individuals in the extension of the NP be possibilities.

Before turning to the next section, it should be noted that *yek -i* DPs, unlike other EFCIs, like *algún*, contribute an embedded uniqueness meaning component, when they are interpreted under modal operators (Moghiseh, 2020). We set this issue aside for now, but Chapter 3 will be devoted to this.

2.2.3 Unembedded sentences

This section is devoted to the behavior of *yek -i* DPs in unembedded sentences, with the aim of showing that *yek -i* DPs differ from other EFCIs documented to date. Section 2.2.3.1 shows that unlike other EFCIs that are grammatical in unembedded sentences, *yek -i* DPs do not convey modality (Alonso-Ovalle and Moghiseh, 2019a). In Section 2.2.3.2, we see that unembedded *yek -i* DPs contribute a uniqueness component conveying that exactly one individual in the extension of the NP satisfies the existential claim.

2.2.3.1 Unembedded *yek -i* DPs do not convey modality

EFCIs differ with respect to their distribution in unembedded sentences. While some EFCIs, like *algún*, are grammatical in unembedded contexts, as (110-a) shows, others, like *vreun*, are ungrammatical in these contexts, as (110-b) shows.

(110) a. María se casó con algún médico.
María se married with ALGÚN doctor
'María married some doctor or other.'
(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

b. *Monica s-a întâlnit cu vreun prieten.
Monica REFL-have.3SG met with VREUN friend.MASC
'Monica met a friend.' (Fălăuş, 2014, p. 122)

Like *algún*, but unlike *vreun*, *yek -i* DPs are grammatical in unembedded sentences, as seen in (111).

(111) Forood dirooz ye ketab-i xarid.
Forood yesterday one book-IND bought-3SG
'Forood bought a book yesterday.' (Alonso-Ovalle and Moghiseh, 2019a, p. 7)

In contrast with other EFCIs that are grammatical in unembedded sentences, *yek -i* DPs do not convey modality (Alonso-Ovalle and Moghiseh, 2019a). As discussed above, EFCIs that are grammatical in unembedded contexts convey a modal meaning component. Some EFCIs, like *algún*, convey an epistemic modal component in unembedded contexts. For instance, the sentence in (110-a) conveys that María married some doctor, and additionally conveys that the speaker does not know which doctor. Others, like *un NP cualquiera*, convey an agent indifference component, conveying that the agent makes an indiscriminate choice. The sentence in (112), for instance, makes an existential claim that Juan grabbed a book, and additionally conveys that he made the choice at random.

(112) Juan compró un libro cualquiera.
Juan bought UN book CUALQUIERA
≈ 'Juan grabbed a book at random.'

(Alonso-Ovalle and Menéndez-Benito, 2018, p. 2)

Unlike other EFCIs, unembedded *yek -i* DPs do not convey agent indifference. The sentence in (114), for instance, while making the existential claim that the agent bought a book, can felicitously describe the scenario in (113), because it does not convey that the agent bought it indiscriminately. The Spanish counterpart of (114) with *un NP cualquiera*, in contrast, would be false in (113).

(113) *Scenario* : Forood wanted to buy *The Iliad* and did so. He wouldn't have bought any other book. (114) = ✓

(114) Forood dirooz ye ketab-i xarid.
Forood yesterday one book-IND bought-3SG
'Forood bought a book yesterday.'

As we have seen in the introduction, Unembedded *yek -i* DPs do not convey epistemic modality, either. Sentences containing a *yek -i* DP can be followed with a *namely* continuation naming an individual in the extension of the NP that satisfies the existential claim, as (115) illustrates. In contrast, other EFCIs, like *algún*, do not allow for this type of continuation, as seen in (116).

(115) Forood dirooz ye ketab-i xarid be esm-e Iliad.
Forood yesterday one book-IND bought-3SG to name-EZ Iliad
'Forood bought a book yesterday, namely *The Iliad*.'

(Alonso-Ovalle and Moghiseh, 2019a, P. 8)

(116) María se casó con algún médico, # en concreto con el Dr. Smith.
María se married with ALGÚN doctor, in particular with the Dr. Smith
'# María married some doctor or other, namely Dr. Smith.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

In the same vein, the dialogue in (117), from Alonso-Ovalle and Moghiseh 2019a, where the addressee asks the speaker about the identity of the entity that satisfies the existential claim, is felicitous. The Spanish counterpart of (117) with *algún*, in contrast, is deviant, as (118) shows.

(117) A: Forood dirooz (ye) ketāb-i xarid.
Forood yesterday (one) book-IND bought-3SG
'Forood bought a book yesterday.'

B: Kodum o?
Which ACC
'Which one?'

(118) A: Forood compró algún libro ayer.
Forood bought ALGÚN book yesterday
'Forood bought some book yesterday.'

B: #¿cuál?
which
'# Which one?'

Aloni and Port (2015) show that asking 'guess who?' after a sentence containing *irgendein*, as in (119), is deviant. The Farsi counterpart of (119) with a *yek -i* DP, in contrast, is felicitous, as (120) shows.

(119) Irgendein student hat angerufen.# Rat mal wer?
some student has called Guess PRT who?
'# Some student called. Guess who?' (Aloni and Port, 2015, p. 119)

(120) Forood dirooz ye ketab-i xarid. Hads bezan chi?
Forood yesterday one book-IND bought-3SG guess hit what
'Forood bought a book yesterday. Guess which?'

Finally, Chierchia (2013) shows that discourses like (121), where the individual satisfying the existential claim is previously mentioned, are deviant with *irgendein*, as in (121). In contrast, they are fine with *yek -i* DPs, as in (122).

(121) John hat geschummelt. #Deshalb ist irgendein Student aus deiner Klasse
John has cheated. Therefore is IRGENDEIN student from your class
ein Betrueger.
a cheater
'John cheated. Therefore a student in your class is a cheater.'

(Chierchia, 2013, p. 251)

(122) Forood ketab-e Iliad-o xarid. Bana-bar-in Forood ye ketab-i
Forood book-EZ Iliad-ACC bought-3SG therefore Forood ye book-IND
xarid-e.
bought-3.SG-PP
'Forood bought *The Iliad*. Therefore, Forood has bought a book.'

(Alonso-Ovalle and Moghiseh, 2019a, P. 8)

From these examples, we conclude that *yek -i* DPs have no detectable modal component when they are unembedded.

2.2.3.2 Unembedded *yek -i* DPs convey uniqueness

In unembedded sentences, *yek -i* DPs, unlike *algún*, contribute a uniqueness component conveying that exactly one individual in the extension of the NP satisfies the existential claim. For illustration, consider the pair of sentences in (123) where more than one individual satisfies the existential claim. While the sentence in (123-a), with *algún*, is felicitous, its counterpart with a *yek -i* DP as in (123-b), is deviant.

(123) a. Forood compró algún libro ayer, una novela y un libro de poesía.
Forood bought ALGÚN book yesterday, a novel and a book of poetry
'Forood bought some book yesterday, a novel and a poetry book.'

b. Forood dirooz ye ketab-i xarid, # ye roman va ye ketab-e sher.
Forood yesterday one book-IND bought-3SG, one novel and one book-EZ poetry
'# Forood bought a book yesterday, a novel and a poetry book.'

Further evidence suggesting that unembedded *yek -i* DPs contribute a uniqueness meaning component comes from the fact asking 'how many?' after a positive episodic sentence containing a *yek -i* DP leads to deviance, as the dialogue in (124) shows. The question is inappropriate because the first sentence already conveys that Forood bought one book. The Spanish counterpart of (124) with *algún*, in contrast, is felicitous, as seen in (125).

(124) A: Forood dirooz ye ketab-i xarid.
Forood yesterday one book-IND bought-3SG
'Forood bought a book yesterday.'

B: #Chand ta katab xarid?
how-many CL book bought-3SG
#'How many books did he buy?'

(125) A: Ayer, Juan compró algún libro viejo.
yesterday, Juan bought-3SG ALGÚN book old
≈ 'Yesterday, Juan bought some old books.'

B: ¿Cuántos libros viejos compró?
how-many books old bought-3SG
'How many books did he buy?'

2.2.4 A new profile of EFCIs

Based on the data provided so far, it seems that *yek -i* DPs instantiate a new profile of EFCIs. *Yek -i* DPs pattern with other EFCIs in DE and modal contexts, but, oddly

enough, with regular existentials in unembedded sentences. Like other EFCIs, *yek -i* DPs are interpreted as plain existentials in DE contexts. But when *yek -i* DPs scope under modals, they trigger meanings stronger than those of regular existentials: they trigger a free choice effect when scoping under deontic modals, but a modal variation effect when scoping under epistemic modals. When looking at the behaviour of *yek -i* DPs in unembedded sentences, we see the emergence of what seems to be, possibly, a new profile of EFCIs. When unembedded, *yek -i* DPs depart from other EFCIs, but behave like regular existentials: they do not convey modality, but convey a uniqueness component. This raises the question that how we can account for the contrast between *yek -i* DPs and other EFCIs. To answer this question, first we need to identify the status of the modal inference and the uniqueness component of *yek -i* DPs, that is, whether they are part of the lexical meaning of *yek -i* DPs or they are derived through competition with stronger alternatives. The next section is devoted to this issue.

2.2.5 Uniqueness and modal components are derived via competition

Kratzer and Shimoyama 2002 claim that the modal inference of *irgendein* is derived via competition with stronger alternatives. Alonso-Ovalle and Menéndez-Benito 2010 argue that the same is true for *algún*. In this section, we argue that both the uniqueness meaning component and the modal component of *yek -i* DPs are also derived through competition with stronger alternatives.

What suggests that the uniqueness meaning component of *yek -i* DPs is not part of their lexical meaning, but rather it is derived via competition, is the fact that this uniqueness meaning component disappears in DE contexts. The infelicity of the sentence in (126) shows this point. [11]

[11] To rescue the sentence in (126), the numeral *ye* needs to be focused. In that event, the sentence is felicitous and conveys that if Forood buys one book, he pays $10, but he pays $15 if he buys two books. We will assume that emphasis on *ye* marks embedded exhaustification and that this is a dispreferred possibility.

(126) Age Forood ye ketab-i bexar-e, $10 mid-e, # amma age do-ta bexar-e, $15 mid-e.
if Forood one book-IND buy-3SG $10 give-3SG, but if two-CL buy-3SG $15 give-3SG
'# If Forood buys any book, he pays $10, but if he buys two, he pays $15.'

If the uniqueness meaning component were truth conditional, sentence (126) would be true. This is, however, not the case. The sentence feels contradictory. This is expected if the uniqueness component is not part of the content of the first *if* -clause, in which case the first conditional is expected to convey that Forood pays $10 in any scenario where he buys at least one book.

The modal component of *yek -i* DPs is derived via competition as well, since it also disappears in DE contexts. The fact that (127) cannot be followed with (128) illustrates this. As we have seen before, *yek -i* DPs trigger a free choice effect when they scope under deontic modals. If the free choice effect was truth conditional, (127) would convey that the speaker doubts that Forood is required to buy *just any* books, therefore, would be compatible with the continuation in (128) specifying that he is required to buy a particular book.

(127) Shak dar-am Forood bayad ye ketab-i bexar-e.
doubt have-1SG Forood must one film-IND buy-3SG
' I doubt that Forood must buy any books.'

(128) . . . , # bayad Oblomov ro bexar-e.
must Oblomov ACC buy-3SG
'# . . . he must buy Oblomov.'

2.2.6 Interim summary

Table 2.1 summarizes the properties of *yek -i* DPs and compares them with other EFCIs. As we can see, *yek -i* DPs seem to instantiate a new profile of EFCIs. *Yek -i* DPs show some core properties of EFCIs: in DE contexts, they contribute plain existential force, but in modal contexts, they convey meanings stronger than those of regular existentials. When they scope under deontic modals, they trigger a free choice effect requiring all

individual in the domain of quantification be permitted options, but a modal variation effect requiring at least two individuals in the domain of quantification be possibilities, when they scope under epistemic modal. Oddly enough, they lose their FCI status in unembedded contexts. Unlike other EFCIs that are grammatical in episodic sentences, unembedded *yek -i* DPs do not convey modality. Like regular existentials, but unlike some EFCIs, like *algún*, unembedded *yek -i* DPs convey uniqueness in unembedded sentences. The uniqueness component of *yek -i* DPs as well as their modal inference are derived via competition, since they disappear in DE contexts.

Given the contribution of *yek -i* DPs in DE contexts and their strengthened interpretations under modals, in line with the literature, we take *yek -i* DPs as existentials that get strengthened conveying a uniqueness meaning component and either a free choice effect, with deontic modals, or a modal variation effect, with epistemic modals. Due to the contrast between the regular existential *yek* DPs and *yek -i* DPs in their interpretation under modals, one can conclude that the suffix *-i* trigger strengthening of the basic existential claim that *yek -i* DPs make. The strengthening of a basic existential interpretation in modal contexts is a distinctive property of EFCIs. We turn next to the issue of where *yek -i* DPs fit in a theory of EFCIs that relies on strengthening of a core existential interpretation, adopting the exhaustification- and alternative-based theory of EFCIs developed in Chierchia 2013 as basic framework.

contexts / EFCIS	*modal*		DE	*unembedded*
	epistemic	*deontic*		
irgendein	strengthened		∃x	modality
algún	strengthened		∃x	modality
vreun	strengthened	*	∃x	*
un qualsiasi	strengthened		*	modality
yek -i DPs	strengthened		∃x	uniqueness/no modality

Table 2.1: *Yek -i* DPs compared to other EFCIs

We finish this section with a puzzle: Why do *yek -i* DPs lose their FCI status in unembedded contexts? The next two sections address this question.

2.3 Deriving the behavior of *yek -i* DPs in DE and modal contexts

As we saw, EFCIs are interpreted as plain existentials in DE contexts, but convey meanings stronger than those that regular existentials trigger under modal operators. Taking the interpretation of EFCIs in DE contexts as baseline motivates theories that rely on strengthening of a basic existential interpretation in modal contexts. A theory along such lines was presented in Chierchia 2013, which was reviewed in Chapter 1. This theory is built to derive the behavior of EFCIs in DE and modal contexts, and, therefore, can simply extend to *yek -i* DPs if we just focus our attention to these contexts. This is so, because, as we have seen, *yek -i* DPs pattern with other EFCIs in DE and modal contexts.

This section is organized as follows. Section 2.3.1 sets out the preliminaries of the analysis providing a review of Chierchia's theory which we rely on to capture the behavior of *yek -i* DPs. Then, we see that Chierchia's theory of EFCIs, as expected, can derive the behavior of *yek -i* DPs in modal contexts (Section 2.3.2) and DE contexts (Section 2.3.3) as it derives the behavior of other EFCIs. Section 2.3.4 summarizes the discussion. We will then, in Section 2.4, turn the focus on the puzzle by focusing on the behavior of *yek -i* DPs in unembedded contexts. This is where *yek -i* DPs depart from other EFCIs.

2.3.1 Preliminaries of the analysis

The basic idea in Chierchia's framework, which was reviewed in Chapter 1, is that EFCIs are existential quantifiers that introduce into the semantic derivation two types of propositional alternatives: (i) scalar alternatives and (ii) pre-exhaustified domain alternatives. These alternatives must be factored into the meaning using their corresponding grammatical exhaustivity operator, O_{σ} for scalar alternatives and $O_{\text{EXH-D}}$ for pre-exhaustified domain alternatives, to strengthen the basic existential assertion that EFCIs make. For ease of exposition, we will work with a single exhaustivity operator, O_{ALT}, excluding the alternatives at once in this chapter, but we will revise this assumption in Chapter 3.

Like other EFCIs, we take *yek -i* DPs to be existential quantifiers that introduce scalar

and domain alternatives. We assume, as illustrated in (129), that the extension of NPs can include both atomic and non-atomic individuals, and that singular marking selects the atomic individuals from the extension of the NP (Scontras, 2022). We further assume that *yek -i* DPs require NPs with singular marking which is interpreted in the semantics, as in (130). The denotation of a *yek -i* DP is given in (131): it denotes the set of properties that are true of at least one atomic individual in a given domain D, where D is a variable over functions from worlds to sets of individuals.[12]

(129) $[\![[_{\text{NP}}\,\text{book}]]\!]^{w} = \left\{ b_1, b_2, b_1 \oplus b_2 \right\}$

(130) $[\![\text{SG}\,[_{\text{NP}}\,\text{book}]]\!]^{w} = \{b_1, b_2\}$

(131) $[\![\text{ye SG NP-i(D)}]\!] = \lambda P_{\langle e,st\rangle}.\lambda w.\exists x[[\![\text{SG NP}]\!]^{w}(x) \wedge |x| \geq 1 \wedge \mathbf{D}_{w}(x) \wedge P_{w}(x)]$

EFCIs are scalar items, and, therefore, they introduce scalar alternatives (Chierchia, 2013). *Yek -i* DPs are composed of the suffix *-i* and a scalar term, namely the numeral *ye* ('one'), which is the lowest point on the numeral scale. The numeral contributes a set of scalar alternatives using the other numerals on the scale. The scalar alternatives, given in (132), are obtained by considering stronger cardinality claims that, for each subdomain $\mathbf{D}'_{w}$, a larger number of individuals in $\mathbf{D}'_{w}$ have property P.

(132) $[\![\text{ye SG NP-i(D)}]\!]^{\sigma\text{-ALT}} =$

$$\{\lambda P.\lambda w.\exists x[[\![\text{ NP}]\!]^{w}(x) \wedge |x| \geq n \wedge \mathbf{D}'_{w}(x) \wedge P_{w}(x)] \mid \mathbf{D}'_{w} \subseteq \mathbf{D}_{w} \wedge n > 1\}$$

EFCIs activate domain alternatives, and, so do *yek -i* DPs. Farsi NPs marked with the suffix *-i* have been linked to the introduction of domain alternatives in previous work. Based on the behavior of *-i* marked NPs in DE contexts, Deal and Farudi (2007) proposed that the suffix *-i* is responsible for introducing domain alternatives. The domain alternatives of *yek -i* DPs, given in (133), are determined by replacing $\mathbf{D}_{w}$ with $\mathbf{D}'_{w}$, where $\mathbf{D}'_{w} \subseteq \mathbf{D}_{w}$, to restrict the domain of quantification to subdomains of $\mathbf{D}_{w}$.

[12] $\mathbf{D}_{w}$ is the value of D at the evaluation world w.

(133) $[\![\text{ye sG NP-i(D)}]\!]^{\text{D-ALT}} =$

$$\{\lambda P.\lambda w.\exists x[[\![\text{sG NP}]\!]^w(x) \wedge |x| \geq 1 \wedge \mathbf{D}'_w(x) \wedge P_w(x)] \mid \mathbf{D}'_w \subseteq \mathbf{D}_w\}$$

The domain alternatives, as Chierchia proposed for EFCIs, then must be exhaustified to form the pre-exhaustified domain alternatives. These alternatives are determined by strengthening each domain alternative, which involves conjoining each of them with the negation of as many other domain alternatives as consistency allows.

For illustration, consider the LF in (134-a). Assuming the domain of quantification in (134-b), the IP in (134-a) denotes the proposition in (134-c) that Forood bought b_1 or b_2.[13] The set of scalar alternatives in (134-d) contains the single proposition that Forood bought both books. The relevant set of domain alternatives and pre-exhaustified domain alternatives is given in (134-e) and (134-f).

(134) a. LF: $[_{\text{IP}}$ ye book-$i_{[+\sigma,+\text{D}]}$ $\lambda 1$ Forood bought t_1 $]$

b. $[\![\text{book}]\!] =$ $\{b_1, b_2\}$

c. $[\![[_{\text{IP}}\ldots]]\!] =$ $b_1 \vee b_2$

d. $[\![[_{\text{IP}}\ldots]]\!]^{\sigma\text{-ALT}} =$ $\{b_1 \wedge b_2\}$

e. $[\![[_{\text{IP}}\ldots]]\!]^{\text{D-ALT}} =$ $\{b_1, b_2\}$

f. $[\![[_{\text{IP}}\ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

This setup is built to account for two core properties shared by EFCIs: their behavior in (i) DE contexts, where they are interpreted as an existential, and (ii) in modal contexts, where they convey a free choice effect. As we saw in Section 2.2, *yek -i* DPs share these two core properties with other EFCIs, and therefore this setup can simply extend to *yek -i* DPs. In the next two subsections, we show how Chierchia's analysis works with *yek -i* DPs in these contexts.

[13] In (134), 'b_n' stands for the proposition that Forood bought book$_n$.

2.3.2 Deriving the behavior of *yek -i* DPs in modal contexts

This subsection spells out the predictions of Chierchia's analysis for the behavior of *yek -i* DPs under deontic possibility modals (Section 2.3.2.1) and deontic necessity modals (Section 2.3.2.2).

2.3.2.1 Possibility modals

Recall that with deontic modals, *yek -i* DPs trigger a free choice effect on their narrow scope reading, with possibility modals. This is illustrated by the deviance of the discourse in (135), repeated form (97), which is inconsistent with free choice effect.

(135) Forood mitun-e ye ketab-i bexar-e, (# amma ne-mitun-e ketab-e b_1 o
Forood can-3SG one book-IND buy-3SG, (but NEG-can-3SG book-EZ b_1 ACC
bexar-e)
buy-3SG)
'Forood can buy any book, but he cannot buy b_1.'

(Alonso-Ovalle and Moghiseh, 2019a, P. 6)

Exhaustification derives the free choice effect of *yek -i* DPs under deontic possibility modals. Consider the sentence in (136), repeated form (95), with the LF in (137).

(136) Forood mitun-e ye ketab-i bexar-e.
Forood can-3SG one book-IND buy-3SG
'Forood can buy a book—any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

Assuming a domain of quantification which contains two books, $\{b_1, b_2\}$, the complement of O_{ALT} contributes the existential claim in (138-a), that Forood is allowed to buy one of the two books. The scalar alternative, in (138-b), conveys that Forood is allowed to buy both books. The set of domain alternatives, in (138-c), contains two propositions: that Forood is allowed to read b_1, that Forood is allowed to read b_2. The domain alternatives need to be strengthened before they are factored into the meaning. The set of pre-exhaustified domain alternatives is given in (138-d). The scalar alternative, in

(138-b), and the pre-exhaustified domain alternatives, in (138-d), are all stronger than the assertion in (138-a), therefore, they must be excluded. Negating the pre-exhaustified domain alternatives in (138-d) yields the propositions in (139), which, when conjoined, amounts to $\Diamond b_1 \leftrightarrow \Diamond b_2$ conveying that either Forood is permitted to buy b_1 and he is also permitted to buy b_2, or that he is not permitted to buy either book. This, together with the assertion in (138-a) enriched with the scalar implicature, expresses the proposition in (140) that Forood is allowed to buy a book and that he is not allowed to buy more than one book and that either book is a permitted option. This corresponds to the attested free choice effect.

(137) LF: $O_{ALT}\Diamond$ [$_{IP}$ ye book-i$_{[+\sigma,+D]}$ λ1 Forood buy]

(138) a. $[\![\Diamond[_{IP}\ldots]]\!]$ = $\Diamond(b_1 \vee b_2)$

b. $[\![\Diamond[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{\Diamond(b_1 \wedge b_2)\}$

c. $[\![\Diamond[_{IP}\ldots]]\!]^{\text{D-ALT}}$ = $\{\Diamond b_1, \Diamond b_2\}$

d. $[\![\Diamond[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{\Diamond b_1 \wedge \neg\Diamond b_2, \Diamond b_2 \wedge \neg\Diamond b_1\}$

(139) a. $\neg(\Diamond b_1 \wedge \neg\Diamond b_2) \Leftrightarrow \neg\Diamond b_1 \vee \Diamond b_2 \Leftrightarrow \Diamond b_1 \rightarrow \Diamond b_2$

b. $\neg(\Diamond b_2 \wedge \neg\Diamond b_1) \Leftrightarrow \neg\Diamond b_2 \vee \Diamond b_1 \Leftrightarrow \Diamond b_2 \rightarrow \Diamond b_1$

(140) $[\![O_{ALT}\Diamond[_{IP}\ldots]]\!]$ = $\Diamond(b_1 \vee b_2) \wedge \neg\Diamond(b_1 \wedge b_2) \wedge (\Diamond b_1 \leftrightarrow \Diamond b_2)$

2.3.2.2 Necessity modals

Likewise, as we have seen before, *yek -i* DPs trigger a free choice effect on their narrow scope reading with deontic necessity modals. The deviance of the discourse in (141), repeated from (102), points to this.

(141) Forood bayad ye ketab-i bexar-e, (# amma ne-mitun-e ketab-e b_1 o bexar-e)
Forood must one book-IND buy-3SG, (but NEG-can-3SG book-EZ b_1 ACC buy-3SG)
'Forood must buy a, any book, but he cannot buy b_1.'

Exhaustification derives the free choice effect of *yek -i* DPs under deontic necessity

modals as well. To illustrate, consider the sentence in (142), repeated form (89-b), with the LF in (143).

(142) Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3SG
'Forood must buy a book and he can buy any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

Assuming a domain with two books, $\{b_1, b_2\}$, the IP in the LF denotes the proposition in (144-a), that Forood is required to buy one of the two books, and contributes the scalar alternative, in (144-b), which conveys that Forood is required to buy both books. The domain alternatives and the strengthened version of them are given in (144-c) and (144-d), respectively. The alternatives, scalar alternative and pre-exhaustified domain alternatives, are stronger than the assertion in (144-a), therefore, they must be exhaustified. Exhaustification delivers the proposition in (144-e), that Forood is required to buy a book, and he is not required to buy both books, and that any book is a permitted option. Again, exhaustification derives the attested free choice effect, as it does with deontic possibility modals.[14]

(143) LF: $O_{ALT}\Box$ [$_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood buy t_1]

(144) a. $[\![\Box[_{IP}\ldots]]\!] = \Box(b_1 \vee b_2)$

b. $[\![\Box[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \{\Box(b_1 \wedge b_2)\}$

c. $[\![\Box[_{IP}\ldots]]\!]^{\text{D-ALT}} = \{\Box b_1, \Box b_2\}$

d. $[\![\Box[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} = \{\Box b_1 \wedge \neg\Box b_2, \Box b_2 \wedge \neg\Box b_1\}$

e. $[\![O_{ALT}\Box[_{IP}\ldots]]\!] = \Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2)$
$\Leftrightarrow \Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge \Diamond b_1 \wedge \Diamond b_2$

As very briefly noted in Section 2.2.2, *yek -i* DPs in addition to the modal inferences they

[14] The reasoning to get $\Diamond b_1 \wedge \Diamond b_2$ in (144-e) is as follows: Given $\Box(b_1 \vee b_2)$ and $\neg\Box(b_1 \wedge b_2)$, $\Box b_1 \leftrightarrow \Box b_2$ implies $\neg\Box b_1 \wedge \neg\Box b_2$. This holds because if , for instance, $\Box b_1$ were true, then $\Box b_2$ would also have to be true, contradicting $\neg\Box(b_1 \wedge b_2)$. $\neg\Box b_1 \wedge \neg\Box b_2$, which is equivalent to $\Diamond\neg b_1 \wedge \Diamond\neg b_2$, implies $\Diamond b_1 \wedge \Diamond b_2$ given $\Box(b_1 \vee b_2)$. This is because in any world where $\neg b_1$ is true, b_2 must be true, and similarly, in any world where $\neg b_2$ is true, b_1 must be true.

give rise to, contribute an embedded uniqueness meaning component under modals. As we will see in Chapter 3, this meaning component is detectable in sentences containing a deontic possibility modal. (140) yields a meaning that is stronger than the attested interpretation of *yek -i* DPs with possibility modals. In sentences containing a necessity modals, the embedded uniqueness meaning component requires that in all worlds, exactly one individual in the extension of the NP satisfy the existential claim. We will see in Chapte 3 that this requirement is detectable with *yek -i* DPs being interpreted under deontic necessity modals. (144-e), therefore, yields a meaning that is weaker than the attested interpretation of *yek -i* DPs with necessity modals. For throughout discussion of this issue, see Chapter 3.

The system discussed above derives the free choice effect of *yek -i* DPs under modals with deontic interpretations. We have seen in Section 2.2.2.2 that under epistemic modals, *yek -i* DPs do not trigger a free choice effect. Instead, they trigger a weaker inference than a free choice effect, namely a modal variation effect which requires that at least two individual in the extension of the NP be possibilities. Hence, in this case, the system we described above makes wrong predictions. The questions that arises are what yields the free choice effect and modal variation effect, and also how to account for the contrast we saw between deontic and epistemic modals. We leave aside discussing what literature suggests to answer the questions, but will get back to this in Section 2.5. Now, let us move on to DE contexts.

2.3.3 Deriving the behavior of *yek -i* DPs in DE contexts

Recall that, like Spanish *algún* or German *irgendein*, but unlike Italian *un* NP *qualsiasi*, *yek -i* DPs are felicitous in downward entailing contexts, where they contribute an apparent narrow scope existential component. The sentence in (145), repeated from (85), conveys that if Forood reads at least one book, any book, he will a get gift.

(145) age Forood ye ketab-i bexun-e, ye jaize migir-e.
if Forood one book-IND read-3SG one gift take-3SG
'If Forood reads a book, he gets a gift.' if [...∃...] then ...

(Alonso-Ovalle and Moghiseh, 2019a, p. 5)

For illustration, consider the LF of the sentence in (145) represented in (146-a). Assuming a domain with two books ($\{b_1, b_2\}$), the IP in (146-a) makes the claim that if Forood reads b_1 or b_2, he will get a gift, in (146-b), and activates the scalar alternative, in (146-c), and the domain alternatives, in (146-d). The set of pre-exhaustified domain alternatives is given in (146-e). The scalar alternative, in (146-c), is entailed by the assertion, therefore it cannot be excluded.[15] The pre-exhaustified domain alternatives are not entailed by the assertion, so they must be excluded. Exhaustification, however, is vacuous. The negation of the alternatives in (146-e) yields the propositions in (147). Conjoining them amounts to $(b_1 \rightarrow g) \leftrightarrow (b_2 \rightarrow g)$, which is entailed by $(b_1 \rightarrow g) \wedge (b_2 \rightarrow g)$, which is also entailed by the assertion in (146-b). Exhaustification, therefore, has no effect: it simply returns the assertion in (146-b), as shown in (148).[16]

(146) a. LF: $O_{ALT}[_{IP}$ if ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood reads t_1, he gets a gift$]$

b. $[\![[_{IP}\ldots]]\!] = (b_1 \vee b_2) \rightarrow g$

c. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \{(b_1 \wedge b_2) \rightarrow g\}$

d. $[\![[_{IP}\ldots]]\!]^{\text{D-ALT}} = \{b_1 \rightarrow g, b_2 \rightarrow g\}$

e. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} = \{b_1 \rightarrow g \wedge \neg(b_2 \rightarrow g), b_2 \rightarrow g \wedge \neg(b_1 \rightarrow g)\}$

(147) a. $\neg((b_1 \rightarrow g) \wedge \neg(b_2 \rightarrow g)) \Leftrightarrow \neg(b_1 \rightarrow g) \vee (b_2 \rightarrow g) \Leftrightarrow (b_1 \rightarrow g) \rightarrow (b_2 \rightarrow g)$

b. $\neg((b_2 \rightarrow g) \wedge \neg(b_1 \rightarrow g)) \Leftrightarrow \neg(b_2 \rightarrow g) \vee (b_1 \rightarrow g) \Leftrightarrow (b_2 \rightarrow g) \rightarrow (b_1 \rightarrow g)$

(148) $[\![O_{ALT}[_{IP}\ldots]]\!] = (b_1 \vee b_2) \rightarrow g$

[15] Sketch of the proof that $(b_1 \wedge b_2) \rightarrow g$ is entailed by $(b_1 \vee b_2) \rightarrow g$: Suppose that $(b_1 \vee b_2) \rightarrow g$. Suppose further that $\neg((b_1 \wedge b_2) \rightarrow g)$, which is equivalent to $(b_1 \wedge b_2) \wedge \neg g$. Since, by assumption, $(b_1 \wedge b_2)$ and $(b_1 \vee b_2) \rightarrow g$, and given that $(b_1 \wedge b_2)$ implies $b_1 \vee b_2$, we arrive at the contradiction $g \wedge \neg g$. This contradiction would not follow if $(b_1 \wedge b_2) \rightarrow g$ were not entailed by $(b_1 \vee b_2) \rightarrow g$.

[16] In this thesis, I adopt the view that conditionals are downward monotone, following Chierchia 2013. For a pragmatic derivation of the well-known non-monotonic behavior of conditionals see von Fintel 2001. The discussion regarding these viewpoints extends beyond the scope of my thesis.

Chierchia (2013) captures the contrast between FCIs in their behavior in DE context by assuming that items like Italian *un* NP qualsiasi, which are deviant in DE contexts, select a presuppositional exhaustivity operator (O^{ps}) which requires the result of exhaustification to be properly stronger than its argument. This requirement will be always violated in DE contexts as sketched above, and, therefore, items that select a presuppositional exhaustivity operator are ruled out in these contexts. In contrast, items which are felicitous in DE contexts and contribute a narrow scope existential force, like *algún* or *irgendein*, select a regular exhaustivity operator which allows vacuous exhaustification. We will pursue the same line by assuming that *yek -i* DPs select the regular exhaustivity operator, as *irgendein* does.

2.3.4 Interim summary

Yek -i DPs pattern with other EFCIS in DE and modal contexts, and, therefore, Chierchia's alternative-based theory of EFCIs can derive the behavior of *yek -i* DPs in these contexts as it derives the behavior of other EFCIs. We turn next to the behavior of *yek -i* DPs in unembedded contexts, where they depart from other EFCIs.

2.4 Accounting for the puzzle of loss of FCI status

This section is devoted to the puzzle of *yek -i* DPs losing their FCI status in unembedded sentences. As we saw, *yek -i* DPs, unlike some EFCIs, like *vreun*, are acceptable in unembedded sentences, but, unlike other EFIs that are grammatical in these environments, *yek -i* DPs have no detectable modal component. The question that arises is what lies behind this contrast. To answer this question, we start with the predictions of the alternative-based theory of EFCIs with respect to the behavior of EFCIs in unembedded sentences (Section 2.4.1). Then, we discuss these predictions with respect to the behavior of *yek -i* DPs in unembedded sentences and propose the hypothesis that what lies behind the contrast between *yek -i* DPs and other EFCIs is that *yek -i* DPs allow for alternative pruning (alternative 'deactivation'), and, consequently, for exhaustification with respect

to some but not all types of alternatives ('partial' exhaustification) (Sections 2.4.2 and 2.4.3). Finally, we conclude the section with a summary (Section 2.4.4).

2.4.1 Modal insertion and modality

Under Chierchia's alternative-based analysis, in the absence of DE or modal operators, when EFCIs are unembedded, exhaustification will always yield a contradiction. For illustration, consider the German counterpart of the sentence in (149-a) with the LF in (149-b). Assuming a domain with two books ($\{b_1, b_2\}$), the argument of the exhaustivity operator makes the existential claim in (149-c). The scalar and pre-exhaustified domain alternatives, given in (149-d) and (149-e), are stronger than the assertion, therefore they need to be excluded. Excluding the scalar alternatives gives us the proposition in (150-a) entailing that one of the pre-exhaustified domain alternatives must be true. Excluding the pre-exhaustified domain alternatives gives us the proposition in (150-b) entailing that the scalar alternatives must be true, which, in fact, contradicts the scalar implicature. Exhaustification with respect to both types of alternatives, therefore, leads to a contradiction, as (151) shows.

(149) a. Maria bought irgendeinen book.

b. LF: $O_{ALT}[_{IP}$ irgendeinen$_{[+\sigma,+D]}$book $\lambda 1$ Maria bought $t_1]$

c. $[\![[_{IP}\ldots]]\!]$ = $b_1 \vee b_2$

d. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ $\{b_1 \wedge b_2\}$

e. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

(150) a. $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \Leftrightarrow (b_1 \wedge \neg b_2) \vee (b_2 \wedge \neg b_1)$

b. $(b_1 \vee b_2) \wedge (b_1 \leftrightarrow b_2) \Leftrightarrow b_1 \wedge b_2$

(151) $[\![$(149-a)$]\!]$ = $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \wedge (b_1 \leftrightarrow b_2) \Leftrightarrow \bot$

Deriving a contradiction, however, is in favour of Chierchia's analysis in accounting for the modal meaning component of those EFCIs that are grammatical in unembedded contexts. Chierchia avoids deriving a contradiction, as a last resort strategy, by inserting

a covert necessity modal between the exhaustivity operator and the FCI, as in (152-a). The argument of the exhaustivity operator in (152-a) makes the claim in (152-b). If the necessity modal is epistemic, (152-b) conveys that Maria must have bought a book. The alternatives are not entailed by the assertion, therefore they must be excluded. Excluding the alternatives, then, derives the contingent proposition in (153), which conveys a free choice effect. Under the epistemic reading of the necessity modal, (153) conveys that Maria must have bought a book and it is not the case that she must have bought both books and moreover that she must have bought b_1 only if, as far as the speaker knows, she bought b_2. This entails the proposition that Maria might have bought b_1 and she might have bought b_2. Exhaustification, therefore, derives the detected speaker's ignorance of EFCIs in unembedded contexts.

(152) a. LF: $O_{ALT}\Box[_{IP}$ irgendeinen$_{[+\sigma,+D]}$book $\lambda 1$ Maria bought $t_1]$

b. $[\![\ \Box[_{IP}\ldots]]\!] =$ $\Box(b_1 \vee b_2)$

c. $[\![\Box[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} =$ $\Box(b_1 \wedge b_2)$

d. $[\![O_\sigma\Box[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{\Box b_1 \wedge \neg\Box b_2, \neg\Box b_1 \wedge \Box b_2\}$

(153) $[\![$(152-a)$]\!] =$ $\Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2)$
$\Rightarrow \quad \Diamond b_1 \wedge \Diamond b_2 \wedge \Diamond\neg b_1 \wedge \Diamond\neg b_2$

Summing up, in the absence of a DE or modal operators, exhaustification with respect to both the scalar and the pre-exhaustified domain alternatives derives a contradiction. This contradiction can be rescued by inserting a covert necessity modal as a last resort strategy. Modal insertion makes exhaustification consistent and delivers a modal meaning component. With this strategy in place, the behavior of items, like *irgendeien* or *algún*, that are grammatical in unembedded contexts, where they convey modality, is accounted for. Modal insertion, however, does not derive the behavior of *yek -i* DPs in unembedded context since, as discussed, they are grammatical in these contexts but have no detectable modal component. This raises the question of why unembedded *yek -i* DPs, unlike *irgendein*, have no modal meaning component, and, yet, they are grammatical and convey uniqueness. The next two subsections aim to answer this question.

2.4.2 Covert modal insertion is not freely available across languages

To answer the question we ended previous subsection with, let us go back to the case of Romanian *vreun*. We have seen in Section 2.2.3 that *vreun* is ungrammatical in unembedded contexts. The example in (154), repeated from (72), shows this.

(154) *Monica s-a întâlnit cu vreun prieten.
Monica REFL-have.3SG met with VREUN friend.MASC
'Monica met a friend.' (Fălăuş, 2014, p. 122)

What causes the contrast between *vreun* and *irgendein*-type EFCIs in unembedded contexts? As we saw, under Chierchia's approach, in the absence of a DE or a modal operator, derivation of a contradiction is inevitable, unless rescued by the insertion of a covert modal. Based on the ungrammaticality of *vreun* in unembedded contexts, Fălăuş (2015) suggests that the insertion of a covert modal, as a last resort strategy, might not be allowed in Romanian, or at least with *vreun*. In the absence of an intervening modal, unembedded *vreun* would be predicted to derive a contradiction. As a result, the contrast between *vreun* and *irgendein*-type EFCIs in unembedded contexts could be due to whether modal insertion is available or not: with modal insertion, EFCIs are grammatical, but convey a modal component; without modal insertion, an unavoidable contradiction is derived, which could give rise to ungrammaticality of *vreun* (Gajewski, 2002).

If we grant that modal insertion is not always available across languages or across items, we can pursue the same line of reasoning, as for *vreun*, and suggest that modal insertion is not an option, if not in Farsi, at least not with Farsi *yek -i* DPs. This possibility, of course, explains why unembedded *yek -i* DPs have no modal component. But it does not explain why unembedded *yek -i* DPs are grammatical.

2.4.3 Pruning alternatives to avoid contradiction

To capture the behavior of *yek -i* DPs in unembedded contexts, where they do not convey modality but convey uniqueness, we propose that some EFCIs allow alternative pruning ('deactivation'), as a last resort strategy, under the threat of deriving a contradiction.

Exhaustification, therefore, takes place with respect to some but not all the alternatives. Let explore this process using the Farsi counterpart of the sentence in (155-a) and its LF in (155-b). As we have seen, strengthening the assertion, in (155-c), via the exclusion of the scalar alternative, in (155-d), and the pre-exhaustified domain alternatives, in (155-e), leads to a contradiction, in (156).

(155) a. Forood bought ye book-i.

b. LF: $O_{ALT}[_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood bought t_1]

c. $[\![[_{IP}\ldots]]\!] = b_1 \vee b_2$

d. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \{b_1 \wedge b_2\}$

e. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} = \{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

(156) $[\![(155\text{-b})]\!] = (b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \wedge (b_1 \leftrightarrow b_2) \Leftrightarrow \bot$

While exhaustification with respect to both sets of alternatives leads to a contradiction, exhaustification with respect to either set, the scalar or the pre-exhaustified domain alternatives (partial exhaustification), results in a contingent proposition. However, partial exhaustification yields two distinct interpretations. Exhaustification with respect to the scalar alternative alone yields the proposition that Forood bought only one book, in (157-b). Exhaustification with respect to the pre-exhaustified domain alternatives alone yields the coherent meaning that Forood bought both books, represented in (157-c).

(157) a. LF: $O_{ALT}[_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood bought t_1]

b. $[\![(157\text{-a})]\!] = (b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)$

c. $[\![(157\text{-a})]\!] = ((b_1 \vee b_2) \wedge (b_1 \leftrightarrow b_2)) \Leftrightarrow (b_1 \wedge b_2)$

Taking partial exhaustification as a possible strategy to avoid the derivation of a contradiction immediately gets us the grammaticality of unembedded *yek -i* DPs. But, what about their uniqueness component? As we saw above, partial exhaustification leads to two interpretations. Among the two interpretations, only the one which comes about via scalar exhaustification corresponds to the attested interpretation of unembedded *yek -i* DPs. Partial exhaustification, therefore, needs to be restricted to scalar alternatives, since

that yields the attested interpretation.

Restricting partial exhaustification to the scalar alternatives can be motivated. There is a crucial difference between partial domain exhaustification and partial scalar exhaustification: partial domain exhaustification delivers a contingent proposition, in (157-c), for instance, but one that is equivalent to the scalar alternatives, in (155-d). Chierchia (2013) argues that exhaustification should be restricted if it delivers one of the grammatically determined alternatives. This restriction is forced by the economy principle given in (158), which, as a result, rules out partial exhaustification with respect to the pre-exhaustified domain alternatives.

(158) *Chierchia's Exhaustification Economy Principle*
Exhaustification is not allowed if it yields a meaning logically equivalent to one of the potential alternatives. (Chierchia, 2013, p.129)

While the availability of rescue strategies, covert modal insertion and partial exhaustification, needs to be better understood, the point is that taking partial exhaustification as a possible strategy guided by the economy principle in (158), with the modal insertion being optional, the behavior of *yek -i* DPs in unembedded context is predicted under Chierchia's framework: the absence of the covert modal explains the lack of mdality with unembedde *yek -i* DPs, and partial exhaustification, which, motivated by the principle in (158), targets the scalar alternatives, explains the uniqueness component.

Before concluding this section, let's briefly comment on a notational consequence of partial exhaustification. As noted before, within Chierchia's framework DPs lexically specify which alternatives are active. This is indicated in the LFs by means of a subscript: a $[+\alpha,+\beta]$ subscript indicates that both $[\alpha]$ and $[\beta]$ alternatives are active, $[+\alpha,-\beta]$ signals $[\alpha]$-alternatives are active and $[\beta]$-alternatives are inactive. As mentioned before, when alternatives are active, they must be used up by an exhaustivity operator. By virtue of that, the structure in (157-a), repeated in (159), that we relied on to advance our discussion on partial exhaustification, doesn't allow partial exhaustification. Instead it requires exhaustification with respect to both types of alternatives. For partial scalar exhaustification, domain alternatives need to be deactivated, as in (160-a), and for partial

domain exhaustification, scalar alternatives need to be deactivated, as in (160-b).

(159) $O_{ALT}[_{IP}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood bought t_1]

(160) a. $O_{ALT}[_{IP}$ ye book-$i_{[+\sigma,-D]}$ $\lambda 1$ Forood bought t_1]

b. O_{ALT} $[_{IP}$ ye book-$i_{[-\sigma,+D]}$ $\lambda 1$ Forood bought t_1]

As a last note in this section, we take $[-\alpha]$ to mean that $[\alpha]$-alternatives need not be exhaustified. We assume that inactive alternatives remain visible in the pragmatics proper, and, therefore, to the Exhaustification Economy Principle.

2.4.4 Interim summary

Adopting the alternative-based theory of EFCIs developed in Chierchia (2013), we analyzed *yek -i* DPs as existential quantifiers with obligatorily activated propositional alternatives, scalar and pre-exhaustified domain alternative. We assumed that modal insertion is not possible in the case of *yek -i* DPs, exhaustification, therefore, derives a contradiction when *yek -i* DPs are unembedded. We proposed that the alternatives that *yek -i* DPs introduce can be pruned ('deactivated')under the threat of deriving a contradiction. An Economy Principle forces deactivation of the domain alternatives. Exhaustification with respect to the scalar alternatives derives the uniqueness component of unembedded *yek -i* DPs.

2.5 An open question: epistemic modals vs. deontic modals

We have seen in Section 2.2.2, that, when interpreted under modals, *yek -i* DPs oscillate between two types of modal inferences, a free choice effect and a modal variation effect, on the type of the modals they combine with: when scoping under deontic modals, *yek -i* DPs, like German *irgendein* or Italian *un qualsiasi*, but unlike Spanish *algún*, trigger a free choice effect; in contrast, when scoping under epistemic modals, *yek -i* DPs, like *irgendein* or *algún*, but unlike *un qualsiasi*, trigger a modal variation effect. This section discusses the source of this contrast between deontic modals and epistemic modals. We start in

Section 2.5.1 with the issue of free choice effect and modal variation effect distinction. Then, we turn to why *yek -i* DPs swing between free choice effect and modal variation effect in Section 2.5.2 .

2.5.1 Free choice effect vs. modal variation effect: different domain alternatives

We have seen that, while some items like *yek -i* DPs and *irgendein* trigger a free choice effect when they scope under modals, other items like *algún* or *vreun* trigger a modal variation effect. Building on the proposal in Alonso-Ovalle and Menéndez-Benito (2010) for *algún*, and in Fălăuş (2014) for *vreun*, Chierchia (2013) takes the difference between modal inferences, free choice effect vs. modal variation effect, that EFCIs trigger to come from the difference between the domain alternatives they induce. The *large* domain alternatives, which include every possible subset of the domain of quantification, accounts for the free choice effect. In contrast, the *small* domain alternatives, including only the singleton subsets of the domain accounts for the modal variation effect. The choice between small and large domain alternative is a lexical property of EFCIs. Let us illustrate these through some examples to see how Chierchia integrates this into the alternative-based theory. Starting with the large domain alternatives, consider the sentence in (161), repeated from (89-a), with the LF in (162) .

(161) Forood mitun-e ye ketab-i bexar-e.
Forood can-3SG one book-IND buy-3SG
'Forood can buy a book—any book.'

Assume a domain with three books ($\{b_1, b_2, b_3\}$). Note that to see the effect of the size of the domain alternatives, there must be at least three individuals in the domain of quantification. With domains containing just two individuals, the subsets of the domain are singletons, and, as a result, modal variation effect and free choice effect turn out to be equivalent. Getting back to the illustration, with three books in the domain, we get the assertion in (163-a). For ease of readability, we put aside the scalar alternatives,

since they do not play any role in deriving the modal inferences. The set of domain alternatives, which include every subset of the domain of quantification, and the set of pre-exhaustified domain alternatives are given in (163-b) and (163-c), respectively.

(162) LF: $O_{ALT}\Diamond$ [$_{IP}$ ye book-i$_{[+\sigma,+D]}$ λ1 Forood buy t_1]

(163) a. $[\![\Diamond[_{IP}\ldots]]\!] = \Diamond(b_1 \vee b_2 \vee b_3)$

b. $[\![\Diamond[_{IP}\ldots]]\!]^{D\text{-}ALT} = \left\{ \begin{array}{c} \Diamond b_1, \Diamond b_2, \Diamond b_3, \\ \Diamond(b_1 \vee b_2), \Diamond(b_1 \vee b_3), \Diamond(b_2 \vee b_3) \end{array} \right\}$

c. $[\![\Diamond[_{IP}\ldots]]\!]^{EXH\text{-}D\text{-}ALT} = \left\{ \begin{array}{c} \Diamond b_1 \wedge \neg\Diamond b_2 \wedge \neg\Diamond b_3, \Diamond b_2 \wedge \neg\Diamond b_1 \wedge \neg\Diamond b_3, \\ \Diamond b_3 \wedge \neg\Diamond b_1 \wedge \neg\Diamond b_2, \\ \Diamond(b_1 \vee b_2) \wedge \neg\Diamond b_3, \Diamond(b_1 \vee b_3) \wedge \neg\Diamond b_2, \\ \Diamond(b_2 \vee b_3) \wedge \neg\Diamond b_1 \end{array} \right\}$

The pre-exhaustified domain alternatives in (163-c) are stronger than the assertion in (163-a), therefore, they need to be excluded. The alternatives are related by the entailment. Negating the weakest alternatives yields the propositions in (164). Supposing that $\Diamond b_1$ is true, then the antecedentes of the conditionals in (164-a) and (164-b) are true. This, consequently, requires the consequent of the conditionals, $\Diamond b_1, \Diamond b_2$, and $\Diamond b_3$ to be true. Exhaustification delivers the proposition in (165), which conveys that Forood is allowed to buy a book, and that each book in the relevant domain is a possible option for him to buy. This reading corresponds to the free choice effect.

(164) a. $\neg(\Diamond(b_1 \vee b_2) \wedge \neg\Diamond b_3) \Leftrightarrow \neg\Diamond(b_1 \vee b_2) \vee \Diamond b_3 \Leftrightarrow \Diamond(b_1 \vee b_2) \rightarrow \Diamond b_3$

b. $\neg(\Diamond(b_1 \vee b_3) \wedge \neg\Diamond b_2) \Leftrightarrow \neg\Diamond(b_1 \vee b_3) \vee \Diamond b_2 \Leftrightarrow \Diamond(b_1 \vee b_3) \rightarrow \Diamond b_2$

c. $\neg(\Diamond(b_2 \vee b_3) \wedge \neg\Diamond b_1) \Leftrightarrow \neg\Diamond(b_2 \vee b_3) \vee \Diamond b_1 \Leftrightarrow \Diamond(b_2 \vee b_3) \rightarrow \Diamond b_1$

(165) $[\![O_{ALT}\Diamond[_{IP}\ldots]]\!] = \Diamond(b_1 \vee b_2 \vee b_3) \wedge \Diamond b_1 \wedge \Diamond b_2 \wedge \Diamond b_3$

Let's explore the effect of small domain alternatives. Consider the Spanish counterpart of the sentence in (166-a), with the LF in (166-b). Assuming a domain with three books, we get the assertion in (167-a), and the domain alternatives in (167-b), which include singletons. Negating the pre-exhaustified domain alternatives in (167-c) delivers the

propositions in (168). Consequently, if we assume that $\Diamond b_1$ is true, it follows that at least one of the $\Diamond b_2$ or $\Diamond b_3$ must also hold. Put differently, at least two of these alternatives must be true. This aligns with the modal variation effect.

(166) a. Forood can buy *algún* book.

b. LF: $O_{ALT}\Diamond$ [$_{IP}$ algún book$_{[+\sigma,+D]}$ $\lambda 1$ Forood buy t_1]

(167) a. $[\![\Diamond[_{IP}\ldots]]\!] = \Diamond(b_1 \vee b_2 \vee b_3)$

b. $[\![\Diamond[_{IP}\ldots]]\!]^{D\text{-}ALT} = \{\Diamond b_1, \Diamond b_2, \Diamond b_3\}$

c. $[\![\Diamond[_{IP}\ldots]]\!]^{EXH\text{-}D\text{-}ALT} = \{\Diamond b_1 \wedge \neg\Diamond b_2 \wedge \neg\Diamond b_3, \Diamond b_2 \wedge \neg\Diamond b_1 \wedge \neg\Diamond b_3, \Diamond b_3 \wedge \neg\Diamond b_1 \wedge \neg\Diamond b_2\}$

(168) a. $\neg(\Diamond b_1 \wedge \neg\Diamond b_2 \wedge \neg\Diamond b_3) \Leftrightarrow \Diamond b_1 \rightarrow (\Diamond b_2 \vee \Diamond b_3)$

b. $\neg(\Diamond b_2 \wedge \neg\Diamond b_1 \wedge \neg\Diamond b_3) \Leftrightarrow \Diamond b_2 \rightarrow (\Diamond b_1 \vee \Diamond b_3)$

c. $\neg(\Diamond b_3 \wedge \neg\Diamond b_1 \wedge \neg\Diamond b_2) \Leftrightarrow \Diamond b_3 \rightarrow (\Diamond b_1 \vee \Diamond b_2)$

(169) $[\![O_{ALT}\Diamond[_{IP}\ldots]]\!] = \Diamond(b_1 \vee b_2 \vee b_3) \wedge ((\Diamond b_1 \wedge \Diamond b_2) \vee (\Diamond b_1 \wedge \Diamond b_3) \vee (\Diamond b_2 \wedge \Diamond b_3))$

The assertion, together with the negated scalar alternative and the negated pre-exhaustified domain alternative delivers the proposition in (169) requiring that if some alternative is true, at least some other alternative must be true, that is at least two of the alternatives must be true. This is the modal variation effect.

2.5.2 Oscillation between free choice effect and modal variation effect

As we have seen, *yek -i* DPs like *irgendein*, on their narrow scope reading with respect to deontic modals, trigger a free choice effect. This is illustrated by the example in (170). When scoping under epistemic modals, *yek -i* DPs like *irgendein*, trigger a modal variation effect, as (171) shows.

(170) Forood mitun-e ye ketab-i bexar-e.
Forood can-3SG one book-IND buy-3SG
'Forood can buy a book—any book.'

(171) Forood mitun-e ye ketab-i xarid-e bash-e. Amma ketab-e b_1 o
Forood can-be ye book-IND bought-3SG be-3SG. But book-EZ b_1 ACC
na-xarid-e.
NEG-bought-3SG
'Forood might have bought a book. But, he hasn't bought b_1.'

If we assume that the domain alternatives of *yek -i* DPs are determined by considering every subdomain of the domain of quantification, as in (172), repeated from (133), we expect to always get a free choice effect when *yek -i* DPs scope under modals. On the other hand, if we assume that the domain alternatives of *yek -i* DPs are determined by considering the singleton subdomain, as in (173), we would always expect the derivation of a modal variation effect when *yek -i* DPs are interpreted under modals. Either way, exhaustification makes wrong predictions.

(172) $[\![\text{ye SG NP-i(D)}]\!]^{\text{D-ALT}} =$

$$\{\lambda P.\lambda w.\exists x[[\![\text{SG NP}]\!]^w(x) \wedge |x| \geq 1 \wedge \mathbf{D}'_w(x) \wedge P_w(x)] \mid \mathbf{D}'_w \subseteq \mathbf{D}_w\}$$

(173) $[\![\text{ye NP-i}]\!]^{\text{D-ALT}} =$

$$\{\lambda P.\lambda w.\exists x[[\![\text{SGNP}]\!]^w(x) \wedge |x| \geq 1 \wedge \mathbf{D}'_w(x) \wedge P_w(x)] \mid \mathbf{D}'_w \subseteq \mathbf{D}_w \wedge \mid \mathbf{D}'_w \mid = 1\}$$

To get the right match between modals and the interpretation of *yek -i* DPs, we need to assume that these items introduce different alternatives in different modal domains. We will assume, like Chierchia 2013 does for other EFCIs like *irgendein*, that *yek -i* DPs have large domain alternatives. However, the large domain alternatives are optional, which means that depending on the contexts, *yek -i* DPs could switch between large or small domain alternatives, and that different modals induce the introduction of different alternatives. Of course this leads one to question how exactly this happens. At the moment, we do not have much more to say on this topic. Since the issue is orthogonal to the main point of the chapter, and, as far as we can tell, largely still an open issue in the field, we will leave it open here, for now.

2.6 Conclusion

This chapter has documented a new profile of EFCIs by investigating the behavior of Farsi *yek -i* DPs, and argued that an alternative-based theory can uniformly account for the behavior of *yek -i* DPs. We showed that *yek -i* DPs pattern with other EFCIs in DE and modal contexts, but, oddly enough, with regular existential in unembedded sentences. Like other EFCIs, *yek -i* DPs are interpreted as plain existentials in DE contexts. When *yek -i* DPs are interpreted under modals, they convey meanings stronger than those of regular existentials. In unembedded sentences, *yek -i* DPs depart from other EFCIs: unlike *vreun*, they are grammatical, but, unlike grammatical unembedded EFCIs, like *irgendein*, they do not convey modality. Instead, they behave like regular existentials in that they convey a uniqueness component.

Adopting the exhaustification- and alternative-based theory of EFCIs presented in Chierchia 2013, *yek -i* DPs were analyzed as existential quantifiers that introduce scalar and pre-exhaustified domain alternatives which must be obligatorily exhaustified. Under this analysis, EFCIs in unembedded sentences are expected to derive a pathological meaning, a contradiction, resulting from the exclusion of the alternatives that these items introduce. Previous literature relied on the insertion of a covert modal as a last resort strategy to avoid the derivation of a contradiction. This strategy leads to the derivation of a modal meaning component. This chapter, based on the behavior of unembedded *yek -i* DPs, proposed the possibility of alternative pruning, and accordingly partial exhaustification (with respect to the scalar alternatives), as another last resort strategy to avoid contradiction. Consequently, the chapter addressed the first two questions posed in the introductory chapter, namely: (i) Can the alternatives that FCIs activate ever be deactivated?; (ii) In which ways can the derivation of a contradiction be avoided?

If the analysis provided in this chapter is on the right track, then EFCIs seem to vary along two new parameters, depending on the rescue strategy they allow to avoid the derivation of a contradiction: (i) whether or not they allow for modal insertion, and (ii) whether or not they allow for partial exhaustification. These parameters of variation lead to the following typology: *vreun* exemplifies a case of EFCIs that allow neither for covert

modal insertion nor for partial exhaustification. The *irgendein*-type EFCIs (EFCIs which convey a modal meaning component in unembedded contexts) represents cases which allow for modal insertion, but not for partial exhaustification. And, *yek -i* DPs exemplify a case of EFCIs that allow for partial exhaustification, but not for modal insertion. This is summarized in Table 2.2.

	Modal insertion	Partial Exh
vreun	–	–
irgendein-type EFCIs	+	–
yek -i DPs	–	+

Table 2.2: The typology of EFCIs based on the rescue strategy they allow to avoid contradiction.

Chapter 3

Local exhaustification of scalar alternatives

3.1 Introduction

Chapter 2 identified a variety of EFCIs in Farsi, referred to as *yek -i* DPs. The chapter showed that *yek -i* DPs share two core properties of EFCIs. First, in DE contexts, they are interpreted as an existential quantifier, as the translation of the sentence in (174), containing the Farsi counterpart of the DE propositional attitude verb *to doubt*, shows.

(174) shak dar-am Forood ye film-i dide bash-e.
doubt have-1.SG Forood one film-IND seen be-3.SG
'I doubt that Forood has watched any movies.' doubt $>\exists$
(Alonso-Ovalle and Moghiseh, 2019a, p.5)

Secondly, when interpreted under modals, *yek -i* DPs trigger a meaning stronger than those that regular existentials trigger. For instance, under deontic modals, *yek -i* DPs induce a free choice effect, requiring all individuals in the domain of quantification to be permitted options. To illustrate, consider the sentence in (175). This sentence makes an existential claim that Forood is required to buy a book, while additionally conveying that each book in the domain of quantification is a permitted option for Forood to buy. Hence, following (175) with a continuation which excludes some books as permitted options, and consequently is incompatible with free choice, results in a contradiction, as (176) shows.

(175) Forood bayad ye ketab-i bexar-e.
Forrod must one book-IND buy-3.SG
'Forrod must buy one book–any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p.7)

(176) Forood bayad ye ketab-i bexar, (# amma ne-mitun-e ketab-e
Forood must one book-IND buy-3.SG, (but NEG-can-3.SG book-EZ
ablomov o bexar-e)
Ablomov ACC buy-3.SG)
'Forood must buy a book, any book, but he cannot buy *Ablomov*.'

As briefly noted but left open, in Chapter 2, Section 2.2.2, when interpreted under modals, *yek -i* DPs, unlike other EFCIs, trigger an additional meaning component, namely an *embedded uniqueness* meaning component. To illustrate this point, consider the sentence in (175). Under the narrow scope reading of *yek -i* DPs, apart from triggering a free choice effect, the sentence triggers a uniqueness meaning component. This component expresses that Forood is required to buy *one and only one* book: in all worlds compatible with what Forood is permitted to buy, he buys *exactly one* book. The observation is that following (175) with (177) is odd. The continuation in (177) simply conveys that the agent is allowed buy one, or more than one, up to three books, and, therefore, contradicting the assertion in (175) that the agent is not allowed to buy more than one book.

(177) . . . , # va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'# . . . and that he is allowed to buy at most three books.'

What accounts for the embedded uniqueness meaning component triggered by *yek -i* DPs under modals? This chapter aims to address this question by extending the exhaustification- and alternative-based theory of FCIs developed in Chierchia 2013. As reviewed in Chapter 1, this theory analyzes FCIs as existential quantifiers introducing scalar and pre-exhaustified domain alternatives, which must be obligatorily exhaustified. More specifically, we will see in this chapter that the investigation of *yek -i* DPs can inform us on the interplay between the two types of alternatives, scalar and pre-exhaustified domain alternatives. This will answer the third question posed in the intro-

ductory chapter, namely: What is the interplay between alternatives of different types? Are they independent?

In Chapter 2, by adopting the exhaustification- and alternative-based theory of FCIs developed in Chierchia 2013, *yek -i* DPs were analyzed as existential quantifiers that introduce scalar and pre-exhaustified domain alternatives which must be obligatorily exhaustified. Adopting this framework, I argue in the current chapter that the observed embedded uniqueness meaning component of *yek -i* DPs comes about through exhaustification of scalar alternatives separately from pre-exhaustified domain alternatives and *obligatorily* below the modal. The core idea in this chapter is that *yek -i* DPs force local exhaustification of scalar alternatives, a property which distinguishes *yek -i* DPs from other EFCIs.

The rest of the chapter is organized as follows. Section 3.2 shows that *yek -i* DPs trigger an embedded uniqueness meaning component, focusing on deontic modals. Section 3.3 briefly reviews the analysis of *yek -i* DPs provided in Chapter 2 with a focus on its predictions for modal contexts. Section 3.4 focuses on the uniqueness meaning component of *yek -i* DPs and argues that *yek -i* DPs require scalar alternatives to be exhaustified locally. Section 3.5 concludes.

3.2 The Puzzle: Embedded uniqueness meaning component in modal contexts

Yek -i DPs trigger an embedded uniqueness meaning component when they are interpreted under modals, both possibility and necessity modals. This teases apart these DPs from other EFCIs, like Spanish *algún* or German *irgendein*, which do not necessarily convey an embedded uniqueness meaning.

Under necessity modals, the uniqueness meaning component conveys that in all compatible worlds, exactly one individual in the extension of the NP satisfies the existential claim. We can see this with the help of the scenario in (178) which is compatible with a free choice interpretation, but not with a uniqueness meaning component. While the

sentences in (179-a), with *algún*, and (179-b), with *irgendein*, can be a felicitous description of the scenario in (178), their Farsi counterpart with a *yek -i* DP, in (180), repeated from (175), is false, because it conveys that Forood is allowed to buy *one and only one* book, meaning that he is not allowed to buy more than one book: in all worlds compatible with what Forood is permitted to buy, he buys *exactly one* book.

(178) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Forood is required to buy a book, and any book is a permissible option for him to buy. He is allowed to buy one or more than one book. (179) = ✓, (180) = ✗

(179) a. Forood tiene que comprar algún libro.
Forood has that buy ALGÚN book
'Forood has to buy some book / some books.'

b. Forood muss irgendein Buch kaufen.
Forood must IRGENDEIN book buy
'Forood must buy a book–any book.'

(180) Forood bayad ye ketab-i bexar-e.
Forrod must one book-IND buy-3.SG
'Forrod must buy one book–any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p.7)

If *yek -i* DPs did not necessarily convey uniqueness, the sentence in (180) would be true and appropriate in the context in (178). The same point can be supported with the help of the continuation in (181), which expresses that Forood is allowed to buy one, two, or, at most, three books. Unlike the pair of sentences in (179), which are compatible with this type of continuation, (180) is not. Following (180) with the continuation in (181) leads to oddity.

(181) . . . , # va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'# . . . and that he is allowed to buy at most three books.'

Under possibility modals, *yek -i* DPs yield an embedded uniqueness meaning component, as well. The uniqueness meaning component under possibility modals conveys

that in some compatible worlds exactly one individual in the extension of the NP satisfies the existential claim. The infelicity of (183) in the scenario in (182) highlights this.

(182) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Forood is required to buy two books, and any book is a permissible option for him to buy. (183)=✗

(183) Forood mitun-e ye ketab-i bexar-e.
Forrod can-3.SG one book-IND buy-3.SG
'Forood can buy a book — any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p.6)

It must be noted that the uniqueness meaning component under possibility modals, predicts (183) to be a felicitous description of scenarios where the addressee is permitted to buy one or more than one book, matching the intuitions. This point is supported with the fact that the sentence in (183) can be felicitously followed with the continuation in (184), which conveys that the addressee is allowed to buy one, two, or, at most, there books.

(184) ..., va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'...and that he is allowed to buy at most three books.'

The sentence in (183) is compatible with the addressee not being permitted to buy more than one book, as well. Hence, (183) can be felicitously followed by the continuation in (185).

(185) ..., va inke ne-mitun-e bishta az ye doone ketab bexar-3.
and that NEG-can-3.SG more from one CL book buy-3.SG
'...and that he is not allowed to buy more than one book.'

These examples illustrate that *yek -i* DPs contribute an embedded uniqueness component when they are interpreted under modals.

To account for the pattern just illustrated, the status of the uniqueness meaning component that *yek -i* DPs trigger under deontic necessity modals needs to be investigated.

Just like we saw with the uniqueness meaning component of unembedded *yek -i* DPs, the uniqueness meaning component that *yek -i* DPs trigger under deontic modals disappears in DE contexts, and, so we will take it to be derived via exhaustification. The sentence in (186), for instance, conveys that the speaker doubts that Forood must buy any books. Therefore, it cannot be appropriately continued with the continuation in (187).

(186) shak dar-am Forood bayad ye ketab-i bexar-e.
doubt have-1.SG Forood must one book-IND buy-3.SG
' I doubt that Forood must buy any books.'

(187) . . . , # bayad do-ta bexar-e.
must two-CL buy-3.SG
'# . . . he must buy two.'

To sum up, *yek -i* DPs trigger an embedded uniqueness meaning component when they scope under modals. This meaning component is derived via competition with stronger alternatives since it disappears in DE environments. I conclude this section with a puzzle: What accounts for the data pattern observed? The rest of this chapter aims to address this question.

3.3 *Yek -i* DPs in modal contexts: a review of the analysis

This section lays out the shortcomings of the analysis of *yek -i* DPs presented in Chapter 2. Adopting the exhaustification- and alternative-based theory of FCIs developed in Chierchia 2013, *yek -i* DPs like other EFCIs, were analyzed as existential quantifiers introducing into the semantic derivation two types of propositional alternatives: scalar alternatives, and pre-exhaustified domain alternatives. These alternatives must be factored into the meaning, via corresponding exhaustivity operators (O_{σ} for scalar alternatives and $O_{\text{EXH-D}}$ for pre-exhaustified domain alternatives), to strengthen the basic existential assertion that EFCIs make. As we saw in the chapter, excluding alternatives above the modal can derive the attested modal inference, namely the free choice effect, that *yek -i*

DPs trigger in modal contexts. Exhaustification in this manner, however, as we will see in this section, falls short in capturing the attested scalar inference, namely the uniqueness meaning component, that *yek -i* DPs trigger under modals. Section 3.3.1 shows that with possibility modals, exhaustification yields a meaning stronger than what is attested. In contrast, with necessity modals, as Section 3.3.2 shows, exhaustification results in a weaker meaning. Section 3.3.3 provides a summary of this pattern.

3.3.1 Possibility modals

In Chapter 2, we saw that exhaustification above the modal can derive the attested modal inference of *yek -i* DPs in modal contexts. For a brief illustration of this, consider the LF in (188-a) with a possibility modal. Note that in this LF and the LF in (194-a), as in Chapter 2, I use a single exhaustivity operator, O_{ALT}, to exclude both scalar and pre-exhaustified alternatives at once. I do so for ease of exposition, and also, because the result it yields would be the same as that where the alternatives are exhaustified via separate exhaustivity operators above the modal.

Let's get back to the LF in (188-a). Assuming a domain with two books, $\{b_1, b_2\}$, the complement of O_{ALT} denotes the disjunctive proposition in (188-b) and contribute the scalar alternative, in (188-c), and the pre-exhaustified domain alternatives, given in (188-d). The alternatives are stronger than the assertion, so they must be excluded. Negating the pre-exhaustified domain alternatives in (188-d) delivers the propositions in (189), which, put together, amount to $\Diamond b_1 \leftrightarrow \Diamond b_2$.

(188) a. LF: $O_{ALT}\Diamond$ [$_{IP}$ ye book-i$_{[+\sigma,+D]}$ $\lambda 1$ Forood buy]

b. $[\![\Diamond[_{IP}\ldots]]\!]$ = $\Diamond(b_1 \vee b_2)$

c. $[\![\Diamond[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{\Diamond(b_1 \wedge b_2)\}$

d. $[\![\Diamond[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{\Diamond b_1 \wedge \neg\Diamond b_2, \Diamond b_2 \wedge \neg\Diamond b_1\}$

(189) a. $\neg(\Diamond b_1 \wedge \neg\Diamond b_2) \Leftrightarrow \neg\Diamond b_1 \vee \Diamond b_2 \Leftrightarrow \Diamond b_1 \rightarrow \Diamond b_2$

b. $\neg(\Diamond b_2 \wedge \neg\Diamond b_1) \Leftrightarrow \neg\Diamond b_2 \vee \Diamond b_1 \Leftrightarrow \Diamond b_2 \rightarrow \Diamond b_1$

Exhaustification yields the proposition in (190). The assertion (the first conjunct), con-

joined with the scalar implicature (the second conjunct) conveys that there is some world where Forood buys a book and no world where he buys more than one book. Conjoining this with the domain implicature (the third conjunct) adds the modal inference that in some world he buy b_1 if and only if he buys b_2 in some world.

(190) $[\![O_{ALT} \Diamond [_{IP} \ldots]]\!] = \Diamond(b_1 \vee b_2) \wedge \neg\Diamond(b_1 \wedge b_2) \wedge (\Diamond b_1 \leftrightarrow \Diamond b_2)$

The proposition in (190) aligns with the attested modal inference that *yek -i* DPs trigger under possibility modals, but no with their scalar inference.

Recall that when interpreted under deontic modals, either possibility or necessity, *yek -i* DPs trigger a free choice effect, which requires all individuals in the domain of quantification to be permitted options. Under the deontic interpretation of the modal, the proposition in (190) conveys that Forood is allowed to buy a book and that he is not allowed to buy more than one book, and, additionally, that either book is a permitted option. This corresponds to the attested free choice effect that *yek -i* DPs trigger under deontic possibility modals, but is stronger than the attested interpretation. To see this, consider the sentence in (192), repeated from (183). As we saw in Section 3.2, when interpreted under possibility modals, *yek -i* DPs convey an embedded uniqueness meaning component, as the infelicity of (192) in the scenario in (191) shows. The uniqueness component under possibility modals conveys that in some worlds compatible with what the agent is permitted to do, exactly one individual in the extension of the NP satisfies the existential claim. Hence, (192) can be felicitously followed with the continuation in (193), which expresses that Forood is allowed to buy one, two, or at most, three books. The truth conditions in (190), however, predict this continuation to result in oddity, contrary to the intuition.

(191) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Forood is required to buy two books, and any book is a permissible option for him to buy. (192)=✗

(192) Forood mitun-e ye ketab-i bexar-e.
Forrod can-3.SG one book-IND buy-3.SG
'Forood can buy a book — any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p.6)

(193) . . . , va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'. . . and that he is allowed to buy at most three books.'

We turn next to the predictions of the analysis sketched above for the interpretation of *yek -i* DPs with necessity modals.

3.3.2 Necessity modals

Consider the LF in (194-a). With a domain of two books, $\{b_1, b_2\}$, the complement of O_{ALT} denotes the proposition in (194-b). The scalar alternative, in (194-c), and the pre-exhaustified domain alternatives, in (194-d), are stronger than the assertion, so they must be exhaustified. Exhaustification delivers the proposition in (194-e).

(194) a. LF: $O_{ALT}\Box$ [$_{IP}$ ye book-i$_{[+\sigma,+D]}$ λ1 Forood buy t_1]

b. $[\![\Box[_{IP}\ldots]]\!]$ = $\Box(b_1 \vee b_2)$

c. $[\![\Box[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{\Box(b_1 \wedge b_2)\}$

d. $[\![\Box[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{\Box b_1 \wedge \neg\Box b_2, \Box b_2 \wedge \neg\Box b_1\}$

e. $[\![O_{ALT}\Box[_{IP}\ldots]]\!]$ = $\Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2)$
$\Leftrightarrow \Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge \Diamond b_1 \wedge \Diamond b_2$

Under the deontic interpretation of the modal, (194-e) conveys that Forood is required to buy a book, and he is not required to buy both books, and, additionally, that any book is a permitted option. This delivers the free choice effect that *yek -i* DPs trigger in deontic modal contexts, but not the embedded uniqueness meaning component. As we saw before, when *yek -i* DPs occur under necessity modals, they trigger an embedded uniqueness meaning component, conveying that in all compatible worlds exactly one individual in the extension of the NP satisfies the existential claim. The sentence in (195),

repeated from (175), therefore, cannot be felicitously followed with the the continuation in (196). The truth conditions derived in (194) are too weak: they predict the continuation to be felicitous, contradicting the intuition.

(195) Forood bayad ye ketab-i bexar-e.
Forrod must one book-IND buy-3.SG
'Forrod must buy one book–any book.'

(Alonso-Ovalle and Moghiseh, 2019a, p.7)

(196) . . . , # va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'# . . . and that he is allowed to buy at most three books.'

3.3.3 Interim summary

The basic setup, which involves wide scope scalar and pre-exhaustified domain exhaustification above the modal, makes wrong predictions for the interpretation of *yek -i* DPs under modals. With possibility modals, exhaustification delivers a meaning stronger than attested. With necessity modals, exhaustification delivers a meaning that is too weak. The next section is devoted to a possible solution to this issue.

3.4 Solving the puzzle

This section explores a possible solution to account for the embedded uniquness meaning component that *yek -i* DPs trigger in modal contexts. In 3.4.1, I show that the uniqueness meaning component can be predicted by local exhaustification of the scalar alternatives below the modal operators, as suggested in Chierchia 2013 as an *optional* strategy to alter the strength of scalar implicatures. Based on the obligatory embedded uniqueness meaning component that *yek -i* DPs trigger under modals, I suggest that this strategy has to be obligatory with *yek -i* DPs, a property that teases apart *yek -i* DPs from other EFCIs. Section 3.4.2 goes beyond deontic modals, exploring the behavior of *yek -i* DPs with other modal operators, in particular, epistemic modals. Finally, Section 3.4.4 turns

back to *yek -i* DPs in DE contexts and lays out the predictions of local exhaustification in these contexts.

3.4.1 Revisit analysis: local exhaustification of scalar alternatives

Within the framework that we are assuming, the scalar implicature of *yek -i* DPs can be strengthened or weakened by local exhaustification of scalar alternatives below the modal, as suggested in Chierchia 2013 as an optional strategy. Local exhaustification of scalar alternatives requires the alternatives to be exhaustified through separate exhaustivity operators, O_{σ}, for scalar alternatives, which scopes under modals, and $O_{\text{EXH-D}}$, for pre-exhaustified domain alternatives, which scopes over modals, as the LF in (197) shows.

(197) LF: $O_{\text{EXH-D}}$ $\Diamond/\Box$ O_{σ} [$_{\text{IP}}$ ye book-i$_{[+\sigma,+\text{D}]}$ λ1 Forood buy t_1]

The predictions of this strategy are provided in Section 3.4.1.1, for the behavior of *yek -i* DPs under possibility modals, and in Section 3.4.1.2, for the behavior of *yek -i* DPs under necessity modals. I end this subsection with an interim summary and conclusions, Section 3.4.1.3.

3.4.1.1 Possibility modals

Local exhaustification of scalar alternatives delivers the attested modal inference and scalar inference triggered by *yek -i* DPs under possibility modals. To illustrate, consider the LF in (198-a). Assuming a domain with two books $\{b_1, b_2\}$, the IP in (198-a) denotes the proposition in (198-b) (that Forood buys b_1 or b_2), and contributes the scalar alternative in (198-c) and the domain alternatives in (198-d).[17]

(198) a. LF: $O_{\text{EXH-D}}\Diamond$ O_{σ} [$_{\text{IP}}$ ye book-i$_{[+\sigma,+\text{D}]}$ λ1 Forood buy t_1]

b. $[\![[_{\text{IP}}\ldots]]\!]$ = $b_1 \vee b_2$

c. $[\![[_{\text{IP}}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{b_1 \wedge b_2\}$

[17] We illustrate with a domain consisting of two individuals for the sake of readability, but the results remain unchanged with larger domains.

d. $[\![[_{IP}\ldots]]\!]^{D\text{-}ALT}$ = $\{b_1, b_2\}$

We start by computing the scalar implicature. Excluding the scalar alternatives yields the proposition in (199) conveying that Forood buys exactly one book.

(199) $[\![O_\sigma\ [_{IP}\ldots]]\!]$ = $(b_1 \vee\ b_2) \wedge \neg(b_1 \wedge b_2)$

We now need to say something about how the alternatives grow past the exhaustivity operator. On this issue, we will assume, following Chierchia (2013, p.138), that the domain alternatives of $O_\sigma\ \phi$ result from pointwise application of O_σ to the domain alternatives of ϕ, as in (200).[18]

(200) $[\![O_\sigma\ [\phi]]\!]^{D\text{-}ALT} = \{[\![O_\sigma]\!]\ (p) : p \in [\![\phi]\!]^{D\text{-}ALT}\}$

At this step of the derivation, the domain alternatives correspond to those in (201). We assume that these grow pointwise by combining with the modal, and that, so, the domain alternatives to the complement of $O_{EXH\text{-}D}$ are those in (202-a).[19] The domain alternatives in (202-a) are pre-exhaustified by conjoining each alternative with the negation of as many other alternatives as consistency allows for. This gives us the set in (202-b). The complement of $O_{EXH\text{-}D}$ itself denotes the proposition in (203).

(201) $[\![O_\sigma\ [_{IP}\ldots]]\!]^{D\text{-}ALT}$ = $\{b_1, b_2\}$

[18] Additionally, we will assume that the scalar alternatives of $O_{EXH\text{-}D}\ \phi$ are simply the scalar alternatives of ϕ, as given in (i).

(i) $[\![O_{EXH\text{-}D}\ [\phi]]\!]^{\sigma\text{-}ALT} = [\![\phi]\!]^{\sigma\text{-}ALT}$

[19] Note that when we restrict the domain to a singleton, as in (i-a), the scalar alternatives, like (i-b), are contradictions. Scalar exhaustification, in (ii), involves conjoining (i-a) with a tautology, the negation of a contradiction.

(i) a. $[\![$ ye book-i$_{\{b_1\}}\ \ldots]\!]$
b. $[\![$ two books$_{\{b_1\}}\ \ldots]\!]$

(ii) $[\![O_\sigma$ ye book-i$_{\{b_1\}}\ \ldots]\!]$

(202) a. $[\![\Diamond\ O_{\sigma}\ [_{IP}\ldots]]\!]^{D\text{-}ALT}$ = $\{\Diamond b_1, \Diamond b_2\}$

b. $[\![\Diamond\ O_{\sigma}\ [_{IP}\ldots]]\!]^{EXH\text{-}D\text{-}ALT}$ = $\{\Diamond b_1 \wedge \neg\Diamond b_2, \Diamond b_2 \wedge \neg\Diamond b_1\}$

(203) $[\![\Diamond\ O_{\sigma}\ [_{IP}\ldots]]\!]$ = $\Diamond((b_1 \vee\ b_2) \wedge \neg(b_1 \wedge b_2))$

The conjunction of (203) with the negation of the pre-exhaustified domain alternatives in (202-b) yields the proposition in (204): that there is at least one permissible world where Forood buys exactly one book, and that he is allowed to buy either book. This is compatible with a scenario where he is allowed to buy one and he is allowed to buy more than one book. This corresponds to the attested interpretation of *yek -i* DPs interpreted under possibility modals.

(204) $[\![O_{EXH\text{-}D}\Diamond\ O_{\sigma}\ [_{IP}\ldots]]\!]$ = $\Diamond((b_1 \vee\ b_2) \wedge \neg(b_1 \wedge b_2)) \wedge \Diamond b_1 \leftrightarrow \Diamond b_2$

3.4.1.2 Necessity modals

Let's move on to the predictions of the local exhaustification with necessity modals. Consider the LF in (205-a). The proposition in (205-b), denoted by the IP, and the negation of its scalar alternatives in (205-c), together with the modal yields the proposition in (205-f). Exhaustification with respect to the pre-exhaustified domain alternatives in (205-g) yields the proposition in (205-h), conveying that in all worlds Forood buys exactly one book and that each book is an option. This conveys an embedded uniqueness meaning component, corresponding to the attested scalar inference of *yek -i* DPs with necessity modals.

(205) a. LF: $O_{EXH\text{-}D}\ \Box\ O_{\sigma}\ [_{IP}$ ye book-$i_{[+\sigma,+D]}\ \lambda 1$ Forood buy $t_1]$

b. $[\![[_{IP}\ldots]]\!]$ = $b_1 \vee b_2$

c. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-}ALT}$ = $\{b_1 \wedge b_2\}$

d. $[\![[_{IP}\ldots]]\!]^{D\text{-}ALT}$ = $\{b_1, b_2\}$

e. $[\![O_{\sigma}\ [_{IP}\ldots]]\!]$ = $(b_1 \vee\ b_2) \wedge \neg(b_1 \wedge b_2)$

f. $[\![\ \Box\ O_{\sigma}\ [_{IP}\ldots]]\!]$ = $\Box((b_1 \vee\ b_2) \wedge \neg(b_1 \wedge b_2))$

g. $[\![\ \Box\ O_{\sigma}\ [_{IP}\ldots]]\!]^{EXH\text{-}D\text{-}ALT}$ = $\{\Box b_1 \wedge \neg\Box b_2, \Box b_2 \wedge \neg\Box b_1\}$

h. $[\![O_{\text{EXH-D}} \Box O_{\sigma} [_{\text{IP}} \ldots]]\!] =$ $\Box((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \wedge \Box b_1 \leftrightarrow \Box b_2$

$\Leftrightarrow \Box((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \wedge \Diamond b_1 \wedge \Diamond b_2$

As we saw in section 3.2, *yek -i* DPs differ from other EFCIs in that they convey an embedded uniqueness meaning component when they scope under modals. If local exhaustification is an option, then I claim that what distinguishes *yek -i* DPs from other EFCIs is that local exhaustification has to be obligatory in the case of *yek -i* DPs, and optional, if not ruled out, in the case of other EFCIs.

3.4.1.3 Interim summary and conclusions

Summing up, excluding scalar alternatives under modals and pre-exhaustified domain alternatives over modals, as in (206), predicts the behavior of *yek -i* DPs in modal contexts. As we saw in Section 3.3.2, excluding alternatives above the modal, as in the LF in (207), does not deliver the attested interpretation. Based on this, I conclude that Farsi *yek -i* DPs require their scalar implicature to be calculated locally, ruling out the LF in (207).

(206) LF: $O_{\text{EXH-D}}$ $\Diamond/\Box$ O_{σ} [$_{\text{IP}}$ ye book-i$_{[+\sigma,+\text{D}]}$ λ1 Forood buy t_1]

(207) *LF: $O_{\text{EXH-D}} O_{\sigma}$ $\Diamond/\Box$ [$_{\text{IP}}$ ye book-i$_{[+\sigma,+\text{D}]}$ λ1 Forood buy t_1]

To pave the way for the proposal I relied on the behavior of *yek -i* DPs with deontic modals. The mechanics of the proposal are indifferent to the nature of the modal. As long as the modal scopes over $O_{\text{EXH-D}}$, we should expect to get the same results independently of the modal flavors. In the next section I probe into the question of weather the same results obtain with other modals by looking into the interpretation of epistemic modals. We will see that *yek -i* DPs seem to trigger an embedded uniqueness meaning component in these contexts, as they do when they occur under deontic modals.

3.4.2 *Yek -i* DPs with epistemic modals

Let's start with epistemic possibility modals. In these contexts, *yek -i* DPs yield an embedded uniqueness meaning component, as they do with deontic modals. The unique-

ness meaning component under epistemic possibility modals conveys that in some but not all epistemically compatible worlds exactly one individual in the extension of the NP satisfies the existential claim. This point is supported with the deviance of following (208) with the continuation in (209), which conveys that there is no epistemically possible world where the addressee buy exactly one book, together with the felicitous continuation of the target sentence with the the sentence in (210). We saw the same pattern with deontic modals.

(208) Forood mitune-e ye ketab-i xarid-e bash-e.
Forood can-3.SG ye book-IND bough-3.SG be-3.SG
'Forood might have bought a book.' (Alonso-Ovalle and Moghiseh, 2019a, p.6)

(209) . . . ,# va inke ne-mitun-e daghighan ye doone xarid-e bash-e.
and that NEG-can-3.SG exactly one CL buough-3.SG be-3.SG
'#. . . and that he couldn't have bought one book.'

(210) . . . , va inke mitune-e ye doone ya do ta xarid-e bash-e.
and that mitun-3.SG one CL or two CL buough-3.SG be-3.SG
'. . . and that he might have bought one book or two books.'

Let's move on to the epistemic necessity modals. The embedded uniqueness meaning component is also detectable with epistemic necessity modals. To see this point, consider the scenario in (211). The observation is that, after uttering (212), Forood can felicitously utter (213-b), but not (213-a). Again, this is similar to what we saw with deontic modals.

(211) *Scenario:* There is a box on the desk. Forood doesn't know what the box contains. He utters the sentence in (212).

(212) Bayad ye ketab-i too jabe bash-e.
must one book-IND in box be-3.SG
'There must be a book in the box.'

(213) a. [Forood opens the box and sees 3 books. He says:] #You see! There are three books.

b. [Forood opens the box. and sees 1 book. He says:] You see! There is one book.

In short, deontic modals and epistemic modals pattern alike, with respect to the embedded uniqueness meaning component of *yek -i* DPs. The obligatory local exhaustification of scalar alternatives, therefore, can correctly predicts the behavior of *yek -i* DPs interpreted under epistemic modals, as it does when the modals receive deontic interpretations.

Before ending this section, let me demonstrate a potential counterexample to the proposal that scalar alternatives must be exhaustificatied locally. As we have already seen, the sentence in (214) with a deontic necessity modals cannot be felicitously followed with the continuation in (215), which expresses that Forood is allowed to buy one, two, or, at most, three books. This suggests that *yek -i* DPs trigger an (obligatory) embedded uniqueness meaning component under deontic modals.

(214) Forood bayad ye ketab-i bexar-e.
Forrod must one book-IND buy-3.SG
'Forrod must buy one book–any book.'

(215) . . . , # va inke mitun-e hadaksar se ta ketab bexar-3.
and that can-3.SG maximum three CL book buy-3.SG
'# . . . and that he is allowed to buy at most three books.'

The counterpart of (214) with an epistemic modal in (216) can be felicitouly followed with the continuation in (217), which conveys that the addressee could have possibly bought one book or, equally possibly, two books. This contradicts the prediction of obligatory exhaustification of scalar alternatives locally.

(216) Forood bayad ye ketab-i xarid-e bash-e.
Forood must one book-IND buough-3.SG be-3.SG
'Forood must have bought a book.'

(217) . . . , va inke momken-e ye doone ya do ta xarid-e bash-e.
and that possible-3.SG one CL or two CL bought-3.SG be-3.SG
'. . . and that it is possible that he has bought one book or two books.'

The obligatory local exhaustification of scalar alternatives predicts (215) to be an infelicitous continuation of the sentence in (214), aligning with the intuition, and (217) to be an

infelicitous continuation of the sentence in (216), contradicting the intuition. Thus, some of the evidence supports the local exhaustification account, and some does not. What accounts for this contrast?

I suggest, as a reasonable hypothesis, that (216) and (217) are only apparent counterexamples to obligatory local exhaustification, and that the contrast arises due to a difference in the modal force of the modals. The hypothesis is that *bayad* and *mitun-e* quantify over a similar restricted set of possibilities (the best set), where *bayad* universally quantifies over such set, and *mitun-e* existentially. The modal *momken-e*, in contrast, is an existential quantifier that can, but doesn't have to, quantify over a different set, a less restricted set of possibilities. Modal flavors are determined by the modal base that the modals quantify over. The reason why (216) and (217) seem inconsistent with the embedded uniqueness account is because the modal in the sentences quantify over different sets. Epistemic *Bayad* ϕ is true if and only if ϕ is true in all the best worlds consistent with the evidence. Epistemic *Momken-e* ϕ is true if and only if ϕ is true in some of the worlds consistent with the evidence. With these assumptions, (214) conveys that in all the best worlds compatible with the evidence, Forood buys exactly one book, and (217) conveys that in some worlds compatible with the evidence, Forood buys one or two books. This explains why (216) can be followed by (217) without oddity, and that they are not against the Obligatory local exhaustification approach.

If *yek -i* DPs require local exhaustification of scalar alternatives, then the question is what happens with *yek -i* DPs in DE contexts. The next section answers this.

3.4.3 Local exhaustification in DE contexts

Let's look at the prediction of the local exhaustification of scalar alternatives for the behavior of *yek -i* DPs in DE contexts. We saw in Chapter 2 that the uniqueness meaning component of *yek -i* DPs disappears in DE contexts. The deviance of the discourse in (218) shows this.

(218) age Forood ye ketab-i bexar-e, $10 mid-e, # amma age do-ta bexar-e, $15 mid-e.
if Forood one book-IND buy-3.SG $10 give-3.SG, but if two-CL buy-3.SG $15 give-3.SG
'# If Forood buys a book, he pays $10, but if he buys two, he pays $15.'

To illustrate what happen in DE contexts, consider the Farsi counterpart of the sentence in (219-a), with the LF in (219-b). Strengthening (220-a) by conjoining it with the negation of the scalar alternative in (220-b) yields the proposition in (220-d). The complement of $O_{\text{EXH-D}}$ denotes the proposition in (220-e) which conveys that if Forood reads exactly one book, he gets a gift. The pre-exhaustified domain alternatives, given in (220-f), are not entailed by (220-e), so they must be exhaustified. Exhaustification is vacuous. The negation of the alternatives in (220-f) gives the propositions in (221). Conjoining them amounts to $(b_1 \rightarrow g) \leftrightarrow (b_2 \rightarrow g)$, which is entailed by the proposition in (220-e).[20] Exhaustification, therefore, has no effect. It yields the proposition in (222), conveying a uniqueness meaning component: that if Forood reads exactly one book, he gets a gift. This truth condition, however, does not correspond to the attested interpretation of the sentence. The proposition in (222) is weaker than the attested interpretation.

(219) a. If Forood reads ye book-i, he gets a gift.

b. LF: $O_{\text{EXH-D}}$ if O_σ[IP ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood reads t_1], he gets a gift

(220) a. $[\![[_{\text{IP}} \ldots]]\!] =$ $(b_1 \vee b_2)$

b. $[\![[_{\text{IP}} \ldots]]\!]^{\sigma\text{-ALT}} =$ $\{b_1 \wedge b_2\}$

c. $[\![[_{\text{IP}} \ldots]]\!]^{\text{D-ALT}} =$ $\{b_1, b_2\}$

d. $[\![O_\sigma\ [_{\text{IP}} \ldots]]\!] =$ $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)$

e. $[\![$ if $O_\sigma\ [_{\text{IP}} \ldots]]\!] =$ $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$

[20] Sketch of the proof that $(b_1 \rightarrow g) \leftrightarrow (b_2 \rightarrow g)$ is entailed by $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$: Assume $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$. Further, assume $(b_1 \rightarrow g) \leftrightarrow (b_2 \rightarrow g)$ is false, indicating either $b_1 \rightarrow g$ is true and $b_2 \rightarrow g$ is false, or $b_1 \rightarrow g$ is false and $b_2 \rightarrow g$ is true. First assume $b_1 \rightarrow g$ is true meaning that $\neg b_1 \vee g$, and $b_2 \rightarrow g$ is false meaning that $b_2 \wedge \neg g$. This gives us $\neg b_1$, b_2, and $\neg g$, leading to a contradiction with our assumption $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$ since $b_1 \vee b_2$ is true, $\neg(b_1 \wedge b_2)$ is true, but g is false. Now assume $b_1 \rightarrow g$ is false meaning that $b_1 \wedge \neg g$, and $b_2 \rightarrow g$ is true meaning $\neg b_2 \vee g$. This gives us b_1, $\neg b_2$, and $\neg g$, again leading to a contradiction with our assumption $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$ for the same reasons. Therefore, assuming $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$ is true and $(b_1 \rightarrow g) \leftrightarrow (b_2 \rightarrow g)$ is false leads to a contradiction, proving that the former entails the latter.

f. $[\![\text{ if } O_\sigma \text{ } [_{IP} \ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{b_1 \rightarrow g \wedge \neg(b_2 \rightarrow g), b_2 \rightarrow g \wedge \neg(b_1 \rightarrow g)\}$

(221) a. $\neg((b_1 \rightarrow g) \wedge \neg(b_2 \rightarrow g)) \Leftrightarrow \neg(b_1 \rightarrow g) \vee (b_2 \rightarrow g) \Leftrightarrow (b_1 \rightarrow g) \rightarrow (b_2 \rightarrow g)$

b. $\neg((b_2 \rightarrow g) \wedge \neg(b_1 \rightarrow g)) \Leftrightarrow \neg(b_2 \rightarrow g) \vee (b_1 \rightarrow g) \Leftrightarrow (b_2 \rightarrow g) \rightarrow (b_1 \rightarrow g)$

(222) $[\![(219\text{-b})]\!] =$ $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$

We just saw above that the LF in (219-b) yields a meaning that is weaker that the attested interpretation of *yek -i* DPs in DE contexts. Such LFs predict the discourse in (218) to be felicitous, in contrast to the intuition. Exhaustifying scalar alternatives below the DE operator leads to weakening. The complement of $O_{\text{EXH-D}}$ expresses the proposition in (220-e), repeated in (223-a), which is weaker than the proposition in (223-b), expressed by its counterpart without the scalar exhaustivity operator. But how could we avoid this weak meaning? Chierchia 2013 argues that exhaustification must be constrained in order to avoid weakening. The formulation of such constraint is given in (224).

(223) a. $[\![\text{ if } O_\sigma \text{ } [_{IP} \ldots]]\!] =$ $((b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$

b. $[\![\text{ if } [_{IP} \ldots]]\!] =$ $(b_1 \vee b_2) \rightarrow g$

(224) *Maximize Strength*

Do not exhaustify S in $[_{S'} \ldots S \ldots]$ if it leads to weakening S'.

(Chierchia, 2013, p.106)

According to the *Maximize Strength* constrain, exhaustification of a sentence S embedded in some environment S' should be avoided if it weakens S'. To illustrate how this constraint works, let's get back to the sentence in (219-a), repeated below in (225-a). O_σ in (225-b) yields the meaning in (225-c), which leads to the weakening of S' : (225-d) is entailed by (226). This violates the *Maximize Strength* constraint, therefore O_σ must be avoided.

(225) a. If Forood reads ye book-i, he gets a gift

b. LF: $O_{\text{EXH-D}}$ $[_{S'}$ if $O_\sigma[_S$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood reads $t_1]$, he gets a gift]

c. $[\![[_S \ldots]]\!] =$ $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2)$

d. $[\![[_{S'}$ if $O_{\sigma}[\ s \ldots] \ldots]\!] =$ $((b_1 \vee\ b_2) \wedge \neg(b_1 \wedge b_2)) \rightarrow g$

(226) $[\![[_{S'}$ if $[\ s \ldots] \ldots]\!] =$ $(b_1 \vee\ b_2) \rightarrow g$

The *Maximize Strength* constraint is checked at each step of derivation. If strengthening leads to weakening, it has to be avoided. In Chapter 2, I argued that the alternatives that *yek -i* DPs introduce can be deactivated under the threat of deriving a contradiction. Assuming that *yek -i* DPs tolerate having deactive alternatives, the violation of the *Maximize Strength* constraint can be avoided if we assume that under the threat of the violation of the *Maximize Strength* constraint the relevant set of alternatives that play a role in weakening of the assertion must get deactivated. Hence, they do not need to be obligatorily factored into the meaning. Under this assumption, the LF of the sentence in (225-a) would be represented as in (227-a). Exhaustification with respect to the pre-exhaustified domain alternatives alone delivers the attested interpretation of *yek -i* DPs in DE contexts. The negation of the alternatives in (227-c) amounts to the proposition $(b_1 \rightarrow g) \leftrightarrow (b_2 \rightarrow g)$, which is entailed by the assertion in (227-b). Exhaustification, therefore, has no effect: it simply returns the assertion in (227-b), as (227-d) shows.

(227) a. LF: $O_{\text{EXH-D}}[_{\text{IP}}$ ye book-$i_{[+\sigma,+D]}$ $\lambda 1$ Forood reads $t_1]$, he gets a gift

b. $[\![[_{\text{IP}} \ldots]]\!] =$ $(b_1 \vee\ b_2) \rightarrow g$

c. $[\![[_{\text{IP}} \ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{b_1 \rightarrow g \wedge \neg(b_2 \rightarrow g), b_2 \rightarrow g \wedge \neg(b_1 \rightarrow g)\}$

d. $[\![O_{\text{EXH-D}}[_{\text{IP}} \ldots]]\!] =$ $(b_1 \vee\ b_2) \rightarrow g$

3.4.4 Split exhaustification in unembedded contexts

Before concluding this chapter let's briefly come back to the cases where *yek -i* DPs are unembedded to illustrate the fact that assuming split exhaustification does not change the picture presented above.

If exhaustification is split, we have two options in unembedded contexts: either scalar alternatives are dealt with before domain alternatives or the other way around. Let us start by discussing the first case. Consider the Farsi counterpart of the sentence in (228-a) with the LF in (228-b). Strengthening the meaning of the IP, in (229-a), by conjoining it

with the negation of the scalar alternative in (229-b) yields the proposition in (229-d).

(228) a. Forood bought ye book-i.

b. LF: $O_{\text{EXH-D}}$ O_{σ} [$_{\text{IP}}$ ye book-$i_{[+\sigma,+\text{D}]}$ $\lambda 1$ Forood bought t_1]

(229) a. $[\![[_{\text{IP}}\ldots]]\!]$ = $b_1 \vee b_2$

b. $[\![[_{\text{IP}}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{b_1 \wedge b_2\}$

c. $[\![[_{\text{IP}}\ldots]]\!]^{\text{D-ALT}}$ = $\{b_1, b_2\}$

d. $[\![O_{\sigma}\ [_{\text{IP}}\ldots]]\!]$ = $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \Leftrightarrow (b_1 \wedge \neg b_2) \vee (b_2 \wedge \neg b_1)$

The set of domain alternatives at this step, determined by applying O_{σ} to the initial set of domain alternatives in (229-c) in a pointwise fashion, is given in (230-a). The proposition in (229-d) implies that one of the pre-exhaustified domain alternatives in (230-b) must be true. This, together with the negated pre-exhaustified domain alternatives, yields a contradiction, as (230-c) shows.[21]

(230) a. $[\![O_{\sigma}\ [_{\text{IP}}\ldots]]\!]^{\text{D-ALT}}$ = $\{b_1, b_2\}$

b. $[\![O_{\sigma}\ [_{\text{IP}}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

c. $[\![O_{\text{EXH-D}}\ O_{\sigma}\ [_{\text{IP}}\ldots]]\!]$ = $(b_1 \vee b_2) \wedge \neg(b_1 \wedge b_2) \wedge b_1 \leftrightarrow b_2 \Leftrightarrow \bot$

As discussed above, we assume that the contradiction is avoided by deactivating the domain alternatives. Deactivating the scalar alternatives is an option blocked by the Exhaustification Economy Principle discussed above.

Excluding the pre-exhaustified domain alternatives before the scalar alternatives does not yield an equivalent meaning: it results in a contingent proposition. Consider the LF in (231-a) for the Farsi counterpart of the sentence in (228-a). The assertion conjoined with the negation of the pre-exhaustified domain alternatives in (231-e) yields the proposition in (231-f).

(231) a. LF: O_{σ} $O_{\text{EXH-D}}$ [$_{\text{IP}}$ ye book-$i_{[+\sigma,+\text{D}]}$ $\lambda 1$ Forood bought t_1]

[21] Regarding (230-a), as noted in footnote 19, the scalar alternatives for prejacents restricted to a singleton are contradictions, and so, the effect of exaustification is null. We illustrate with two alternatives for the sake of readability, but nothing changes with larger domains.

b. $[\![[_{IP}\ldots]]\!] =$ $b_1 \vee b_2$

c. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} =$ $\{b_1 \wedge b_2\}$

d. $[\![[_{IP}\ldots]]\!]^{\text{D-ALT}} =$ $\{b_1, b_2\}$

e. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} =$ $\{b_1 \wedge \neg b_2, b_2 \wedge \neg b_1\}$

f. $[\![O_{\text{EXH-D}}\ [_{IP}\ldots]]\!] =$ $((b_1 \vee b_2) \wedge (b_1 \leftrightarrow b_2)) \Leftrightarrow (b_1 \wedge b_2)$

As anticipated in footnote 18, the scalar alternative at this step, as defined in (232), is simply the scalar alternative of the complement of $O_{\text{EXH-D}}$, given in (233-a). The proposition in (231-f) is equivalent to (and, so it entails) the scalar alternative in (233-a); hence, this alternative cannot be excluded. Exhaustification, therefore, gives the contingent proposition in (233-b), conveying that Forood bought both books.

(232) $[\![O_{\text{EXH-D}}\ [\phi]]\!]^{\sigma\text{-ALT}} = [\![\phi]\!]^{\sigma\text{-ALT}}$

(233) a. $[\![O_{\text{EXH-D}}[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = [\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} =$ $\{b_1 \wedge b_2\}$

b. $[\![O_\sigma\ O_{\text{EXH-D}}\ [_{IP}\ldots]]\!] =$ $b_1 \wedge\ b_2$

This derivation violates the Exhaustification Economy Principle. Again, there are two options available: to deactivate the domain alternatives or to deactivate the scalar alternatives. The latter option would result in a meaning that also violates the Exhaustification Economy Principle. Deactivating the domain alternatives is then the only option.

3.5 Conclusion

In this chapter, we have seen, unlike other EFCIs, *yek -i* DPs, when interpreted under modals, trigger an embedded uniqueness meaning component. Building upon this observation, we argued that the scalar and domain alternativess must be used up by independent exhaustivity operators, and showed that exhaustification of the scalar alternatives, in the case of *yek -i* DPs, is always clause-bounded. We have seen that in DE contexts, this leads to global weakening, violating the Maximize Strength constraint. To address this, we proposed that the alternative that *yek -i* DPs induce, in particular the scalar alternatives, can get pruned to avoid global weakening.

I end the conclusion with brief discussion of the contrast between EFCIs with respect to their scalar component. As Alonso-Ovalle and Menéndez-Benito 2010 noted, Spanish *algún* does not convey a uniqueness component in positive episodic sentences. The sentence in (234), for instance, conveys that there is at least one fly in the soup.

(234) Hay alguna mosca en la sopa.
There is ALGUNA fly in the soup
(Alonso-Ovalle and Menéndez-Benito, 2010, p.24)

Unlike *algún*, German IRGENDEIN and Farsi *yek -i* DPs convey a uniqueness meaning component in positive episodic sentences. The sentences in (235), with *iregendein*, and in (236), with *yek -i* DPs, for instance, convey that there is exactly one fly in the soup.

(235) Da ist irgendeine Fliege in der Suppe.
There is IRGENDEIN fly in the soup
(Alonso-Ovalle and Menéndez-Benito, 2010, p.27)

(236) Ye magas-i too soup-e.
One fly-IND in soup-is

As we have seen, in modal contexts, *yek -i* DPs differ from other EFCIs in that they can convey an obligatory uniqueness meaning component. The sentences in (237), repeated from (175), for instance, is deviant in scenarios where Forood is allowed to buy one or more than one book, because it conveys that in all compatible worlds Forood buys exactly one book.

(237) Forood bayad ye ketab-i bexar-e.
Forood must one book-IND buy-3.SG
'Forood must buy one book–any book.'
(Alonso-Ovalle and Moghiseh, 2019a, p.7)

Unlike *yek -i* DPs, *irgendein* and *algún* do not convey a uniqueness meaning component in modal contexts. For instance the sentences in (238-a), with *algún*, and in (238-b), with *irgendein*, unlike their *yek -i* DPs counterpart in (237), are felicitous in a scenario where Forood is allowed to buy one or more than one book.

(238) a. Forood tiene que comprar algún libro.
Forood has that buy ALGÚN book
'Forood has to buy some book / some books.'

b. Forood muss irgendein Buch kaufen.
Forood must IRGENDEIN book buy
'Forood must buy a book–any book.'

If the analysis that we provided in this chapter is on the right track, we could assume that EFCIs vary with respect to their scalar component: whether they convey uniqueness or not, and whether they convey local uniqueness or not. Given these parameters of variation, the predicted typology is as follows: EFCIs like *algún* exemplify cases that do not convey a uniqueness component and a local uniqueness component; EFCIs like German *irgendein* convey a uniqueness component, but not a local uniqueness component; Farsi *yek -i* DPs exemplify a case of EFCIs that convey both uniqueness and local uniqueness component; another type of EFCIs that could, in principle, be expected is one that conveys a local uniqueness component, but not a uniqueness component. This is summarized in the Table 1.

	Local uniqueness	No local uniqueness
Uniqueness	*yek -i* DPs	*irgendein*
No uniqueness	?	*algún*

Table 3.1: The predicted typology of EFCIs

The findings in this chapter raise some questions: (i) What is the reason why *algún* does not convey a uniqueness component?; (ii) why does the scalar component of *yek -i* DPs have to be local? (iii) are there any EFCIs that convey a local uniqueness component, but not a uniqueness component? I leave addressing these questions to further research, however we provide some remark about (i) and (iii). With respect to (i), one could assume that in the case of *algún*, the scalar alternative is determined differently: *algún* triggers a competition with *all*, rather than with other numerals, and, thus, it has a *not all*

component as its scalar implicature. This would also explain why *algún* does not convey a local uniqueness component. If the uniqueness component is tied to the type of the scalar competitors of EFCIs, then it would be reasonable to conclude that the answer to (iii) is negative, and that, there is no EFCIs that convey a local uniqueness component, but not a uniqueness component.

Chapter 4

Neutralizing Free Choice Items via Maximal Domain Restriction: Farsi *har -i* DPs

4.1 Introduction

Across languages, we find a variety of FCIs , referred to in the literature as universal FCIs (UFCIs), that, like EFCIs, can trigger a free choice effect. Some examples of UFCIs are: English *any* DPs (Dayal 2005, 2013), Italian *qualsiasi* and *qualunque* (Aloni 2007a; Chierchia 2013), and Spanish *cualquiera* (Menéndez-Benito 2010). Like EFCIs, UFIs are licensed under possibility modals and trigger a free choice effect, as EFCIs do. The sentence in (239-a) conveys that every book is a permitted option for Mary to buy. Its counterpart with the regular indefinite *a*, given in (239-b), does not. Hence, (239-a) is false in contexts where there is a book such that Mary is not allowed to buy, while (239-b) is not.

(239) a. Mary can read any book.
b. Mary can read a book.

UFCIs, however, have a restricted distribution. In positive episodic sentences, UFCIs, unlike EFCIs, which are licensed in these contexts and convey existential force, are ruled out, as (240-a) shows, unless, as seen in (240-b), they are modified with a postnominal clausal modifier. This phenomenon was first analyzed in Legrand 1975 and labelled

as 'subtrigging' (Dayal, 1998, 2005, 2013). When subtrigged, UFCIs convey universal force: (240-a) claims that for every objection x that her students raised, Mary answered x. Accordingly, the sentence is false in situations where there is an objection that had been raised by Mary's students that she did not answer. Subtrigged UFCIs also convey counterfactual implications. (240-b) implies (241): affirming (240-a) but rejecting (241) leads to a contradiction.

(240) a. *Mary answered any objection.
b. Mary answered any objection that her students raised.
(based on (Dayal, 1998, p. 446))

(241) If Mary's students had objected to her handwriting, she would have answered that objection too.

UFCIs and EFCIs contrast with respect to their behavior in sentences containing necessity modals. UFCIs are felicitous in these contexts but only when they are subtrigged. Again, when subtrigged, they convey universal force. This is illustrated in (242). EFCIs, in contrast, as we saw in previous chapters, are felicitous even in the absence of subtrigging and convey existential force.

(242) a. *Mary must read any book.
b. Mary must read any book on the reading list.
(based on (Chierchia, 2013, p. 309))

This chapter identifies a variety of Farsi DPs, which we refer to as *har -i* DPs. These DPs are formed by adding the determiner *har* to *-i* marked bare NPs, which constitute the shared component of the Farsi EFCI *yek -i* DPs, investigated in the previous two chapters. *Har -i* DPs show the core properties of UFCIs: as we will see in detail in Section 4.2, they are licensed in sentences containing possibility modals and convey a free choice effect, but deviant in positive episodic sentences and in sentences containing necessity modals, unless they are subtrigged.

The current chapter presents a puzzling case where the presence of a particular mor-

pheme forces FCIs to lose their FCI status. When combined with the accusative marker *-ro*[22], *har -i* DPs lose their FCI status. In such case, they don't convey a free choice effect in sentences containing possibility modals, and are licensed in positive episodic sentences and in sentences containing necessity modals. The goal in this chapter is to show that this behavior follows from the Wide Scope Constraint Analysis of UFCIs (Chierchia 2013) under minimal assumptions about the semantics effect of *-ro*.

The Wide Scope Constraint Analysis assumes that UFCIs are existential quantifiers that introduce propositional alternatives that need to be exhaustified. Moreover, the analysis assumes a constraint ('Wide Scope constraint'), which forces the UFCIs to scope over modals. These assumptions, together with another constraint, which will be described in Section 4.3, suffice to capture the core properties of UFCIs, and, therefore, can naturally be extended to *har -i* DPs. As anticipated above, when combined with the accusative marker *ro*, *har -i* DPs lose their FCI status. To explain this, we take *ro* as a subset selection function that returns a singleton subset of the set it applies to. This neutralizes the alternatives that *har -i* DPs introduce because they are equivalent to the assertion, therefore not excludable. With no alternatives to exclude, the loss of FCI status follows.

The rest of the chapter is organized as follows. Section 4.2 presents the distribution and interpretation of *har -i* DPs. Section 4.3 shows how the Wide Scope Constraint Analysis of UFCIs can capture the behavior of *har -i* DPs. Section 4.4 shows that *har -i* DPs lose their FCI status when they combine with the accusative marker *ro*, and discusses how this can be accounted for by the Wide Scope Constraint Analysis with a minimal assumption about the semantic contribution of *-ro*. Section 5.5 concludes the chapter with some issues for further research.

4.2 Farsi *har -i* DPs

Previous chapters investigated a variety of FCIs in Farsi, *yek -i* DPs formed by the determiner *ye* ('one') combining with bare NPs marked with the enclitic *-i*, which, as discussed, behave as EFCIs. This chapter investigates the behavior of another type of FCIs

[22]The accusative marker *ro* is realized as *ra* in the formal register.

in Farsi. These items, which we call *har -i* DPs, are formed by adding the determiner *har* to bare NPs marked with the enclitic *-i*.

Har -i DPs, as we will see in this section, have the core properties of UFCIs: as Section (4.2.1) shows, they are deviant in positive episodic sentences, and, as we will see in Section 4.2.2, they are deviant in sentences containing necessity modals but licensed in sentences with possibility modals. We end the section with a summary of the discussion in Section 4.2.3 .

4.2.1 Positive episodic sentences

Like other UFCIs, *har -i* DPs are deviant in positive episodic sentences, as in (243). When subtrigged, *har -i* DPs, as in (244), are acceptable in such sentence, as other UFCIs are.

(243) *Roya har ketab-i xund.
Roya HAR book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

(244) Roya har ketab-i ke roo miz-esh boode bashe xund-e.
Roya HAR book-IND that on table-POSS.3SG was SUBJ read-3.SG
'Roya read any book that was on her desk.'
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

Sentences with subtrigged *har -i* DPs show the three characteristic properties which have been reported for sentences containing other subtrigged UFIs. First, they convey universal force: (244) claims that for each book x that was on Roya's desk, she read x. Therefore, the sentence is false in the scenario in (245) . Second, they convey counterfactual implications. (244) implies (246), and, thus, affirming (244) but rejecting (246) leads to a contradiction. Third, as reported for subtrigged *any* DPs (Dayal, 1995), subtrigged *har -i* DPs do not license discourse anaphora: (244) cannot be continued with (247).

(245) *Scenario:* There were three books on Roya's desk (*The Stranger*, *Oblomov*, and *The Idiot*). Roya read two of them and no other book.

(246) If *Ulysses* had been on her desk, Roya would have read it.

(247) #...Forood ham una ro xund-e.
...Forood too those ACC read-PERF-3.SG
'...and Forood has read them too.'

4.2.2 Modal contexts

In sentences containing possibility modals, *har -i* DPs, just like other UFCIs, are licensed and convey a free choice effect requiring each individual in the extension of the NP to be a permitted option. The sentence in (248), for instance, cannot felicitously describe the scenario in (249) because the sentence conveys that Roya is allowed to read any of the five books.

(248) Roya mitun-e har ketab-i bexun-e.
Roya can-3.SG HAR book-IND read-3.SG
'Roya can read any book.' (Alonso-Ovalle and Moghiseh 2019b, p. 690)

(249) *Scenario:*
There are five books ($\{b_1,...b_5\}$). Roya is not allowed to read b_4 or b_5.
(Alonso-Ovalle and Moghiseh 2019b, 689)

In sentences containing necessity modals, *har -i* DPs pattern with other UFCIs in that they are deviant, as (250) shows, unless they are modified by subtrigging, as in (251). In this case, they have universal force: (251) conveys that Roya must read *every* book she finds.

(250) *Roya bayad har ketab-i bexun-e.
Roya must HAR book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

(251) Roya bayad har ketab-i ke peyda mikon-e bexun-e.
Roya must HAR book-IND that find does-3.SG read-3.SG
'Roya must read any book that she finds.'
(Alonso-Ovalle and Moghiseh 2019b, 690)

4.2.3 Interim summary

Table 4.1 provides a summary of the empirical investigation in this section. As we can see, *har -i* DPs show the core characteristic of UFCIs: they are deviant in positive episodic sentences and in sentences containing necessity modals, unless they are modified, where in which case they convey universal force; they are felicitous in sentences containing possibility modals and convey a free choice effect. The next section provides a review of the Wide Scope Constraint Analysis of UFCIs (Chierchia 2013), which, as expected, suffices to capture the behavior of *har -i* DPs in the environments discussed so far. We then, in Section 4.4, turn our attention to the puzzling case where *har -i* DPs lose their FCI status when combined with the accusative marker *-ro*.

	◇	□	unembedded	subtrigging
any DPs	FCE	*	*	∀x
qualsiasi/qualunque	FCE	*	*	∀x
har -i DPs	FCE	*	*	∀x

Table 4.1: *har -i* DPs compared to other UFCIs

4.3 The Wide Scope Constraint Analysis (Chierchia 2013)

I start in Section 4.3.1 by setting out the basics of the Wide Scope Constraint Analysis of UFCIs presented in Chierchia 2013, which in fact, are similar to what we saw in previous chapters for EFCIs. Next, we see in Section 4.3.2 how this analysis captures the behavior of UFCIs in positive episodic sentences. Turning next to modal contexts, Section 4.3.3 shows how the contrasts between EFCIs and UFCIs in these contexts come about. Section 4.3.4 focuses on the effects of subtrigging and how exhaustification accounts for them. Finally, Section 4.3.5 provides a summary of the discussion.

4.3.1 Preliminaries of the analysis

Just as Chierchia 2013 analyzes FCIs, as reviewed in Chapter 1, we take *har -i* DPs to be existential quantifiers and to have the denotation in (253). Assuming that the extension of NPs can include both atomic and plural individuals, as (252) illustrates, (253) denotes the set of properties that are true of at least one plural individual, built from distinctive atomic individuals, in the extension of the NP.

(252) $[\![[_{NP}\,\text{book}]]\!]^w = \left\{ \begin{array}{c} b_1, b_2, b_3, \\ b_1 \oplus b_2, b_1 \oplus b_3, b_2 \oplus b_3, b_1 \oplus b_2 \oplus b_3 \end{array} \right\}$

(253) $[\![\text{har NP-i(D)}]\!] =$

$$\lambda P_{\langle e,st\rangle}.\lambda w.\exists x \left[[\![NP]\!]^w(x) \wedge \textsc{plural}(x) \wedge \mathbf{D}_w(x) \wedge \ \forall y_{atomic} \sqsubseteq x[P_w(y)] \right]$$

On top of this existential quantification, again, like other FCIs, *har -i* DPs introduce scalar and domain alternatives into the semantic derivation. The scalar alternative, given in (254), is determined by replacing the existential force of *har -i* DPs with universal force. Bare NPs marked with the suffix *-i* in Farsi have been associated with the introduction of domain alternatives, as argued in Deal and Farudi 2007 and also in Chapter 2 for *yek -i* DPs. The domain alternatives, as seen in (255), are determined by restricting the domain of quantification of the *har -i* DP to any subset of its original domain D. The domain alternatives needs to get strengthened forming the pre-exhaustified domain alternatives. To do so, each domain alternative in a set is conjoined with the negation of any other domain alternatives in the same set that are innocently excludable.[23]

(254) $[\![\text{har NP(D)}]\!]^{\sigma\text{-ALT}} =$

$$\{\lambda P.\lambda w.\forall x \left[[[\![NP]\!]^w(x) \wedge \textsc{pl}(x) \wedge \mathbf{D}_w(x)] \rightarrow \ \forall y_{atomic} \sqsubseteq x[P_w(y)] \right] \}$$

(255) $[\![\text{har NP(D)}]\!]^{\text{D-ALT}} =$

$$\left\{ \lambda P.\lambda w.\exists x \left[[\![NP]\!]^w(x) \wedge \textsc{plural}(x) \wedge \mathbf{D}'_w(x) \wedge \forall y_{atomic} \sqsubseteq x[P_{w'}(y)] \right] \mid \mathbf{D}'_w \subseteq \mathbf{D}_w \right\}$$

Then, the scalar and pre-exhaustified domain alternatives, which will end up being

[23] A proposition q is an alternative to p that is innocently excludable, in case every way of conjoining p with as many negated alternatives to p as consistency with p allows for entails ¬q (Fox 2007; Alonso-Ovalle 2008).

propositional through pointwise functional application, must be factored into the meaning to strengthen the basic existential claim containing the FCI. Based on the case study from Farsi *yek -i* DPs discussed in Chapter 3, the alternatives must be exhaustified through two different types of exhaustivity operators, one for scalar and one for pre-exhaustified domain alternatives. For ease of exposition, a single exhaustivity operator, O_{ALT}, excluding both types of alternatives at once, is used since , in this case, the result will be the same as when two separate exhaustivity operators exclude the alternatives consecutively.

To illustrate, consider the LF in (256-a). Assuming (256-b) as the domain of quantification, the IP in (256-a) makes the existential claim in (256-c) that Roya read two or more books. The set of scalar alternatives to (256-a) includes the single proposition that Roya read all books, in (256-d). The set of pre-exhaustified, in (256-f), determined on the basis of the domain alternatives in (256-e), includes propositions each of which conveys, for any group of books g, that Roya read each book in g and no other books.[24]

(256) a. LF: $[_{IP}$ [har book -i$]_{[+\sigma,+D]}$ $\lambda 1$ Roya read t_1]

b. $[\![\text{book}]\!] = \{b_1, b_2, b_3, b_1 \oplus b_2, b_1 \oplus b_3, b_2 \oplus b_3, b_1 \oplus b_2 \oplus b_3\}$

c. $[\![[_{IP}\ldots]]\!] = (b_1 \wedge b_2) \vee (b_2 \wedge b_3) \vee (b_1 \wedge b_3) \vee (b_1 \wedge b_2 \wedge b_3)$
$\Leftrightarrow (b_1 \wedge b_2) \vee (b_2 \wedge b_3) \vee (b_1 \wedge b_3)$

d. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \{b_1 \wedge b_2 \wedge b_3\}$

e. $[\![[_{IP}\ldots]]\!]^{\text{D-ALT}} = \left\{ \begin{array}{c} (b_1 \wedge b_2) \vee (b_2 \wedge b_3) \vee (b_1 \wedge b_3), \\ (b_1 \wedge b_2) \vee (b_2 \wedge b_3),\ (b_2 \wedge b_3) \vee (b_1 \wedge b_3), \\ (b_1 \wedge b_2) \vee (b_1 \wedge b_3), \\ b_1 \wedge b_2,\ b_2 \wedge b_3,\ b_1 \wedge b_3, b_1 \wedge b_2 \wedge b_3 \end{array} \right\}$

f. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} = \left\{ \begin{array}{c} (b_1 \wedge b_2 \wedge \neg b_3) \vee (b_2 \wedge b_3 \wedge \neg b_1) \vee (b_1 \wedge b_3 \wedge \neg b_2), \\ (b_1 \wedge b_2 \wedge \neg b_3) \vee (b_2 \wedge b_3 \wedge \neg b_1),\ (b_2 \wedge b_3 \wedge \neg b_1) \\ \vee (b_1 \wedge b_3 \wedge \neg b_2),\ (b_1 \wedge b_2 \wedge \neg b_3) \vee (b_1 \wedge b_3 \wedge \neg b_2), \\ b_1 \wedge b_2 \wedge \neg b_3,\ b_2 \wedge b_3 \wedge \neg b_1,\ b_1 \wedge b_2 \wedge \neg b_3 \end{array} \right\}$

[24] We will consider only those domain alternatives that correspond to proper subsets of the domain of quantification, therefore eliminating $b_1 \wedge b_2 \wedge b_3$ from the set of domain alternatives in (256-e).

Next, we illustrate how the Wide Scope Constraint Analysis works with the help of *har -i* DPs.

4.3.2 Positive episodic contexts

Recall that in positive episodic sentences, *har -i* DPs, just like other UFCIs, are deviant, as in (257), repeated from (243).

(257) *Roya har ketab-i xund.
Roya each book-IND read-3.SG
'Roya read any book .'

In positive episodic sentences, exhaustification, just like what we saw with EFCIs in Chapter 2 , derives a contradiction. To illustrate, consider the LF in (258) for the sentence in (257). Assuming the domain in (256-b), the IP in (258) denotes the proposition in (256-c) and contributes the scalar alternative in (256-d) and the pre-exhaustified domain alternatives in (256-f). Both types of alternatives are stronger than the assertion in (256-c), therefore they must be excluded. The pre-exhaustified domain alternatives are related by entailment. Therefore, only the weakest alternative needs to be negated, because its negation will entail the negation of the stronger ones. The negation of the weakest pre-exhaustified domain alternative in (256-f), given in (259), is equivalent to the conjunction of the conditionals in (260) conveying that if Roya read all books in a particular group, she read any other book. Conjoining these conditionals amounts to the bi-conditional in (261) (the domain implicature). The assertion in (256-c) conjoined with the domain implicature in (261) yields the first conjunct in (262). This entails the scalar alternative in (256-d) and thus contradicts the scalar implicature (the second conjunct in (262)). Exhaustification derives a contradiction, as (262) shows, which explains the deviance of *har -i* DPs in positive episodic sentences.

(258) LF: O_{ALT} $[_{IP}$ [har book -i]$_{[+\sigma,+D]}$ $\lambda 1$ Roya read t_1]

(259) $(b_1 \wedge b_2 \wedge \neg b_3) \vee (b_2 \wedge b_3 \wedge \neg b_1) \vee (b_1 \wedge b_3 \wedge \neg b_2)$

(260) a. $\neg(b_1 \wedge b_2 \wedge \neg b_3) \Leftrightarrow \neg(b_1 \wedge b_2) \vee b_3 \Leftrightarrow (b_1 \wedge b_2) \rightarrow b_3$

b. $\neg(b_1 \wedge b_3 \wedge \neg b_2) \Leftrightarrow \neg(b_1 \wedge b_3) \vee b_2 \Leftrightarrow (b_1 \wedge b_3) \rightarrow b_2$

c. $\neg(b_2 \wedge b_3 \wedge \neg b_1) \Leftrightarrow \neg(b_2 \wedge b_3) \vee b_1 \Leftrightarrow (b_2 \wedge b_3) \rightarrow b_1$

(261) a. $(b_1 \wedge b_2) \leftrightarrow (b_1 \wedge b_3) \leftrightarrow (b_2 \wedge b_3)$

(262) $[\![(258)]\!] = [(b_1 \wedge b_2) \wedge (b_2 \wedge b_3) \wedge (b_1 \wedge b_3)] \wedge \neg[b_1 \wedge b_2 \wedge b_3] \Leftrightarrow \bot$

In Chapter 2, alternative pruning was proposed as a last resort strategy to avoid deriving contradictions with *yek -i* DPs. However, this strategy cannot be extended to *har -i* DPs. One possible reason is that alternative pruning might be a property specific to certain lexical items. Therefore, this strategy is inherently excluded with *har -i* DPs.

4.3.3 Modal contexts

As we saw above and also in Chapter 2, with unembedded FCIs, excluding both scalar and pre-exhaustified domain alternatives delivers a contradiction. The insertion of a modal between the exhaustivity operator and the FCI, as in (263), avoids the derivation of a contradiction. Configurations of such form deliver a contingent proposition with an existential reading, regardless of whether the modal is a possibility or a necessity modal. For an illustration of how this work see Chapter 2, Section 2.3.2.

(263) LF: O_{ALT} $\Diamond/\Box$ $FCI_{[+\sigma,+D]}$ ...

As seen before, UFCIs, like *har -i* DPs as the case at hand, are licensed with possibility modals, as in (264), repeated from (248), but deviant with necessity modals, as seen in (265), repeated from (250).

(264) Roya mitun-e har ketab-i bexun-e.
Roya can-3.SG HAR book-IND read-3.SG
'Roya can read any book.' (Alonso-Ovalle and Moghiseh 2019b, p. 690)

(265) *Roya bayad har ketab-i bexun-e.
Roya must HAR book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

The narrow scope configuration in (263), where *har -i* DPs scope under modals, cannot account for the contrast between (264) and (265). What, then, can explain the contrast? The analysis of FCIs presented in Chierchia 2013 assumes an interpretation constraint ('Wide Scope Constraint') which requires UFCIs, unlike EFCIs, to scope over modals. We refer to this analysis tailored for UFCIs as the Wide Scope Constraint Analysis. The wide scope configurations of UFCIs are expected to behave *exactly* as the unembedded cases. Exhaustification, as expected, derives a contradiction, regardless of the type of the modal. To illustrate, consider the LF in (266-a), for the sentence in (264), and the LF in (267-a), for the sentence in (265). Assuming the domain in (256-b), the argument of O_{ALT} in (266-a) denotes the proposition that Roya is allowed to read each book in a group of books (the first conjunct in (266-b)), and in (267-a) the proposition that Roya is required to read each book in a group of books (the first conjunct in (267-b)). In both cases, as in the case of positive episodic sentences, the assertion together with the domain implicature entails the scalar alternative, and, so, contradicts the scalar implicature, as (266-b) and (267-b) show. Excluding both types of alternatives, therefore, leads to a contradiction.

(266) a. O_{ALT} [$_{IP}$ [har book -i]$_{[+\sigma,+D]}$ $\lambda 1$ $\Diamond$ [Roya read t_1]]

b. $[\![$ (266-a) $]\!] = ((\Diamond b_1 \wedge \Diamond b_2) \vee (\Diamond b_2 \wedge \Diamond b_3) \vee (\Diamond b_1 \wedge \Diamond b_3)) \wedge$
$\underbrace{\neg(\Diamond b_1 \wedge \Diamond b_2 \wedge \Diamond b_3)}_{\text{scalar implicature}} \wedge \underbrace{[(\Diamond b_1 \wedge \Diamond b_2) \leftrightarrow (\Diamond b_2 \wedge \Diamond b_3) \leftrightarrow (\Diamond b_1 \wedge \Diamond b_3)]}_{\text{domain implicature}} \Leftrightarrow \bot$

(267) a. O_{ALT} [$_{IP}$ [har book -i]$_{[+\sigma,+D]}$ $\lambda 1$ $\Box$ [Roya read t_1]]

b. $[\![$ (267-a) $]\!] = ((\Box b_1 \wedge \Box b_2) \vee (\Box b_2 \wedge \Box b_3) \vee (\Box b_1 \wedge \Box b_3)) \wedge$
$\underbrace{\neg(\Box b_1 \wedge \Box b_2 \wedge \Box b_3)}_{\text{scalar implicature}} \wedge \underbrace{[(\Box b_1 \wedge \Box b_2) \leftrightarrow (\Box b_2 \wedge \Box b_3) \leftrightarrow (\Box b_1 \wedge \Box b_3)]}_{\text{domain implicature}} \Leftrightarrow \bot$

Under the wide scope construal of *har -i* DPs, the derivation of a contradiction aligns with the distribution of *har -i* DPs when they occur in sentences containing necessity modals, but not when they occur in sentences containing possibility modals. Notice that in both (266-b) and (267-b) there are two modal statements: one associated with the domain implicature and one with the scalar implicature. The contradiction, then, only arises if the domain of quantification of the modal for the domain implicature is iden-

tical to the domain of quantification of the modal for the scalar implucture. The Wide Scope Constraint Analysis assumes that this is not the case by exploiting the context dependency of modals and proposing an interpretation constraint ('Modal containment'), given in (268), which requires the modal domain for the scalar implicature to be a proper subset of the modal domain for the domain implicature.

(268) *Modal Containment*: the modal base in the scalar implicature must be a proper subset of the modal base in the domain implicature. (Chierchia 2013, p. 314)

Modal Containment rescues the derivation of a contradiction with possibility modals. To see this, consider (266), repeated below in (269) with free variables C, representing the modal base for the domain implicature, and C′, representing the modal base for the scalar implicature, with C′ being a proper subset of C. The assertion together with the domain implicature is equivalent to the first conjunct in (269-b), which conveys that there are permitted worlds where Roya reads b_1, permitted worlds where she reads b_2, and permitted worlds where she reads b_3. This conjunct is consistent with the second conjunct in (269-b), if Modal Containment is satisfied. For illustration, assume the permitted worlds in (270). The derived meaning in (269-b) is true in the model in (270), when the value of C is $\{w_1, w_2, w_3\}$ and the value of C′ is $\{w_1\}$, and conveys the attested free choice effect.

(269) a. O_{ALT} [$_{IP}$ [har book -i]$_{[+\sigma,+D]}$ $\lambda 1$ $\Diamond$ [Roya read t_1]]

b. $[\![$ (269-a) $]\!] = (\Diamond_C b_1 \wedge \Diamond_C b_2 \wedge \Diamond_C b_3) \wedge \neg(\Diamond_{C'} b_1 \wedge \Diamond_{C'} b_2 \wedge \Diamond_{C'} b_3)$

(270)

w_1	$b_1 \wedge \neg b_2 \wedge \neg b_3$	w_2	$b_2 \wedge \neg b_1 \wedge \neg b_3$	w_3	$b_3 \wedge \neg b_1 \wedge \neg b_2$

With necessity modals, in contrast, Modal Containment cannot rescue the derivation of a contradiction. To see this, consider (267), repeated below in (271). The assertion together with the domain implicature (the first conjunct in (271-b)) conveys that Roya reads all books in all permitted worlds in C. This is inconsistent with the second conjunct in (271-b) for any subset of C. In this case, then, exhaustification yields a contradiction.

(271) a. O_{ALT} [$_{IP}$ [har book -i]$_{[+\sigma,+D]}$ $\lambda 1$ $\Box$ [Roya read t_1]]

b. $[\![$ (269-a) $]\!] = (\Box_C b_1 \wedge \Box_C b_2 \wedge \Box_C b_3) \wedge \neg(\Box_{C'} b_1 \wedge \Box_{C'} b_2 \wedge \Box_{C'} b_3)$

To sum up, the Wide Scope Constraint forces UFCIs to scope over modals. In this case, exhaustification always yields a contradiction. Modal Containment avoids the derivation of a contradiction but only with possibility modals, and not with necessity modals. This explains the acceptability of *har -i* DPs with possibility modals and their deviance with necessity modals. We will see next that Modal Containment also helps with subtrigging.

4.3.4 Subtrigging

As seen before, UFCIs are deviant in positive episodic sentences and in sentences containing necessity modals, unless they are modified, in which case they convey universal force. We can see this contrast with the help of the episodic sentence in (272), repeated from (243), and its subtrigged counterpart in (273), repeated from (244).

(272) *Roya har ketab-i xund.
Roya HAR book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

(273) Roya har ketab-i ke roo miz-esh boode bashe xund-e.
Roya HAR book-IND that on desk-POSS.3SG was SUBJ read-3.SG
'Roya read any book that was on her desk.'
(Alonso-Ovalle and Moghiseh 2019b, p. 690)

Notice that subtrigging clauses modifying *har -i* DPs use the subjunctive mood, as seen in (273). The same has been reported for subtrigged UFCIs in Romance languages, like Italian *qualsiasi*. The sentence in (274) shows this.

(274) Ieri Gianni ha visto qualsiasi studente cui saltasse in testa di volerlo vedere.
'Yesterday Gianni saw-PERF any student that was-SUBJ caught by the whim of seeing him.' (Chierchia 2013, p. 317)

For Chierchia, the subjunctive mood signals that the subtrigging clause contains a covert

necessity modal, as in the LF in (275-a) for the sentences in (273). In this LF, the *har -i* DP scopes over the modal and the Wide Scope Constraint is, therefore, satisfied. When Modal Containment holds, meaning that the modal base in the scalar implicature is a proper subset of of the modal base in the domain implicature, the structure in (275-a) would yield a contingent proposition. The assertion together with the predicted domain implicature conveys, as in (275-b), that Roya read all books that were on her desk in all worlds in the domain of the modal for the domain implicature (call it C). The scalar implicature, in (275-c), conveys that it is not the case that Roya read all books that were on her desk in all worlds in the domain of the modal for the scalar implicature (call it C′). When Modal containment holds, meaning that $C' \subset C$, the second conjunct in the set description in (275-b) asymmetrically entails the second conjunct in the set description in (275-c), which means that the set in (275-b) will be a subset of the set in (275-c). This, on its turn, means that (275-c) will asymmetrically entail (275-b), and that, therefore, the conjunction of (275-b) and (275-c) will not be a contradiction.[25]

(275) a. O_{ALT} [har book-i that □ was on her desk]$_{[+\sigma,+D]}$ $\lambda 1$ [Roya read t_1]

b. $\lambda w.\forall x \in \{y|\textsc{book}_w(y) \wedge \Box_{w'}\textsc{desk}_{w'}(y)\}[\textsc{read}_w(R,x)]$ (Assertion + D imp)

c. $\lambda w.\neg\forall x \in \{y|\textsc{book}_w(y) \wedge \Box_{w'}\textsc{desk}_{w'}(y)\}[\textsc{read}_w(R,x)]]$ (Scalar imp)

4.3.5 Interim summary

Adopting the Wide Scope Constraint Analysis of UFCIs presentend in Chierchia 2013, *har -i* DPs are analyzed as existential quantifiers that obligatorily activate propositional alternatives, scalar and pre-exhaustified domain lternative. These alternatives must be used up by an exhaustivity operator to strengthen the basic existential claim the EFCIs make. Exhaustification, together with the assumption that the domain of the modal shifts, accounts for the behavior of *har -i* DPs in positive episodic sentences and in modal contexts, as it does for other UFCIs. We turn next to the puzzling behavior of *har -i* DPs

[25]While the setup explains why there is no contradiction, Chierchia seems to derive this by assuming that the modal is epistemic. It is nevertheless unclear that an epistemic interpretation derives the dispositional flavor tied to subtrigging. Further discussion on this is required.

when they combine with the accusative marker *-ro*.

4.4 Loss of FCI status: The effect of the accusative marker *-ro*

This section is devoted to the puzzling effect of the accusative marker *-ro*. *Har -i* DPs, which, as noted above, show core properties of UFCIs, lose their characteristic FCI status when they combine with the accusative marker *-ro*.

Previous work has identified similar cases where a particular morphology forces FCIs to lose their FCI status. Spanish *algún* is an EFCI that conveys an *epistemic* modal component—it makes an existential claim and conveys that the speaker does not know which individual satisfies the claim (Alonso-Ovalle and Menéndez-Benito 2015a). The sentence in (276), for instance, makes the existential claim that María married a doctor, and additionally conveys that the speaker does not know which doctor María married. Therefore, it would be odd to follow (276) with a *namely* continuation naming the individual that satisfies the existential claim, as (277) shows.

(276) María se casó con algún médico.
María se married with ALGÚN doctor
'María married some doctor or other.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

(277) María se casó con algún médico, (# en concreto con el Dr. Smith.)
María se married with ALGÚN doctor, in particular with the Dr. smith
'María married some doctor or other, namely Dr. Smith.'

(Alonso-Ovalle and Menéndez-Benito, 2015a, p. 2)

In contrast, the plural counterpart of *algún*, *algunos*, does not convey an epistemic modal component (Alonso-Ovalle and Menéndez-Benito 2011). Sentences with *algunos*, therefore, can be felicitously followed with a *namely* continuation showing that the speaker knows the individuals that satisfy the existential claim. The sentence in (278) illustrates this.

(278) María habló con algunos estudiantes, en concreto con Pedro, Juan y Carlos.
María talked to ALGUNOS students, in particular with Pedro, Juan and Carlos
' María talked to some students, namely with Pedro, Juan, and Carlos

(based on (Alonso-Ovalle and Menéndez-Benito, 2011, p. 213))

To account for the contrast between *algún* and *algunos*, Alonso-Ovalle and Menéndez-Benito (2011) adopt the view that the interpretation of FCIs is determined by the exclusion of the propositional alternatives that they invoke (Kratzer and Shimoyama, 2002). They show that the plural morphology of *algunos* trigger the contrast by making the alternatives that *algún* introduces equivalent to the assertion and therefore non-excludable. With no alternatives to exclude in the case of *algunos*, the neutralization of the FCI status follows.

In this section, we see that the pattern can extend beyond *algún*. This section is organized as follows: Section 4.4.1 presents the puzzle showing that *har -i* DPs lose their FCI status when they combine with the accusative marker *-ro*. Section 4.4.2 shows that this behavior falls out of the alternative-based theory of FCIs in Chierchia 2013, adopted as the basic framework in this dissertation, with certain assumptions about the semantics effect of *-ro*. The analysis that is put forward is parallel to the explanation for the loss of FCI status of *algunos* presented in Alonso-Ovalle and Menéndez-Benito 2011 in that it also relies on the derivation of alternatives that are equivalent to the assertion, hence not excludable. Section 4.4.3 summarizes the discussion in the present section.

4.4.1 Data: *har -i* DPs combined with the accusative marker *-ro*

Har -i DPs lose their FCI status when they are are marked with the accusative marker *-ro*. As we have seen, in the absence of *-ro*, *har -i* DPs trigger a free choice effect in sentences containing possibility modals. When they combine with *-ro*, the free choice effect is not detectable. For instance, the sentence in (279), with a *-ro* marked *har -i* DP, conveys that there is a certain group of books that Roya is allowed to read, not that she is allowed to read any book, as its counterpart without *-ro* in (248) does.

(279) Roya mitun-e har ketab-i ro bexun-e.
Roya can-3.SG each book-IND ACC read-3.SG
'There is a particular group of books each of which Roya can read.'

Under the scope of a necessity modal, *har -i* DPs are acceptable when marked with the accusative marker *-ro*, even if they are not subtrigged. The sentence in (280), for instance, is not deviant. It conveys that there is a certain group of books each of which Roya must read, not that Roya must read a book and that any book is a permitted option for her. In contrast, *har -i* DPs without *-ro* are deviant when not subtrigged, as seen in the sentence in (250).

(280) Roya bayad har ketab-i ro bexun-e.
Roya must each book-IND ACC read-3.SG
'There is a certain group of books each of which Roya must read.'

In combination with *-ro*, *har -i* DPs are licensed in positive episodic sentences, again, even in the absence of subtrigging. The sentence in (281), for instance, is not deviant and conveys that Roya read all books in a certain group of books. This contrasts, again, with what happens with *har -i* DPs without *-ro*, as in (243).

(281) Roya har ketab-i ro xund.
Roya each book-IND ACC read-3.SG
'Roya read each book (in a certain group of books).'

Based on these examples, we can conclude that *har -i* DPs do not show the characteristic properties of UFCIs when they are marked with the accusative marker *-ro*.

Before turning to the next section, it must be noted that *har -i* DPs marked with *-ro* cannot be cases of covert subtrigging, since they do not have the typical properties of subtrigged sentences. To see this, consider the episodic positive sentence in (281), containing a *har -i* DP marked with *-ro*. As note before, subtrigged UFCIs contribute, on top of universal quantification, a counterfactual inference. Although the sentence in (281) has a universal force, like its subtrigged counterparts without *-ro*, the universal claim is restricted to a contextually determined group, and they do not license counterfactual

inferences. Consider, for instance, the scenario in (282). The sentence in (281) is true in this scenario. The universal claim is naturally understood as being restricted to the set of books on Roya's desk, and (281) does not convey any counterfactual inferences, like (283). If the universal interpretation in (281) were due to some sort of covert subtrigging, the sentence would have been false in the scenario in (282) where the expected counterfactual inferences, like the one in (283), are false.

(282) *Scenario*: There were three books on Roya's desk: *The Stranger*, *Oblomov*, and *The Idiot*. Roya read them all. She wouldn't have read any other books.

(283) If *Ulysses* had been on her desk, Roya would have read it.

Another piece of evidence suggesting that *-ro* marked *har -i* DPs are not cases of covert subtrigging is that the *-ro* marked *har -i* DPs, as in (281), unlike their subtrigged counterparts without *-ro*, naturally license discourse anaphora, as the discourse in (284) shows.

(284) Roya har ketab-i ro xund, Forood ham una ro xund.
Roya each book-IND ACC read-3.SG, Forood too those ACC read-3.SG
'Roya read each book in a certain group of books, Forood has read them too.'

Table 4.2 summarizes the properties of *har -i* DPs and contrasts them with the properties of *har -i* DPs marked with the accusative marker *-ro*. As we can see, the FCI behavior of *har -i* DPs is lost when they are combined with *-ro*.

	◇	□	unembedded
har -i DPs	FCE	*	*
har -i DPs + *-ro*	no FCE	✓	✓

Table 4.2: *har -i* DPs + *-ro*: No FCI behavior

We conclude, then, with a puzzle: What accounts for the contrast between *har -i* DPs and *-ro* marked *har -i* DPs? The next section aims to answer this question. The account we provide builds on the analysis of *har -i* DPs presented in the previous section, and captures the contrast under certain assumptions about the semantic effect of *-ro*.

4.4.2 The effect of *-ro*

Section 4.4.2.1 explains the assumptions about the semantics of the accusative marker *-ro*. Section 4.4.2.2 shows that these assumption together with the analysis of *har -i* DPs in Section 4.3 can account for the contrast under discussion.

4.4.2.1 Assumptions about the semantics of *-ro*

With a particular proposal for *har -i* DPs on the table, we turn next to the effect of the accusative marker *-ro* on their interpretation. We will zoom in here on cases where *yek -i* DPs marked with *-ro* are within an island: the antecedent of a conditional, in (285), and a relative clause, in (286). [26]

(285) Age Roys ye ketab-i ro bexun-e, jaize migire.
if Roya one book-IND ACC read-3.SG gift take-3.SG
'Roya will get a prize if she reads a certain book.'

(286) Roya in shayea ro ke Forood ye atiqe-i ro qachaq karde takzib kard.
Roya this rumor ACC that Forood one antique-IND ACC smuggle did denial did
'Roya denied the rumor that Forood has smuggled a certain antique.'

While the counterparts of the examples in (285) and (286) without *-ro* allow for interpretations where the existential scopes within the minimal clause containing it, as (287) and (288) illustrate, *-ro* enforces exceptional scope interpretations, as the translations of the examples convey.

(287) Age Roya ye ketab-i bexun-e, jaize migir-e.
if Roya one book-IND read-3.SG gift take-3.SG
'Roya will get a prize if she reads a book.'

[26] We cannot make justice to the intricacies of *-ro* marking here. We refer the reader to Hosseini Fatemi 2013 and Jasbi 2020 for more involved discussions of the effect of *-ro* marking.

(288) Roya in shayea ro ke Forood ye atiqe-i qachaq karde takzib kard.
Roya this rumor ACC that Forood one antique-IND smuggle did denial did
'Roya denied the rumor that Forood has smuggled an antique.'

To capture this, we will endorse the view, defended in Schwarzschild 2002, that exceptional scope interpretations come about through maximal domain restriction. The particular proposal that we would like to make is that *-ro* introduces a contextually determined singleton subset selection function, a function that returns a singleton subset of any set that it applies to, as in (289).[27]

(289) $[\![\text{-ro}_{i_{\langle et,et\rangle}}]\!] = \lambda f_{\langle e,t\rangle} : \textsc{singleton}(\mathbf{i}).\mathbf{i}(f) \quad (\textsc{singleton}(\mathbf{i}) \Leftrightarrow \forall h[\mathbf{i}(h) \subseteq h \wedge |\mathbf{i}(h)| = 1])$

The denotation of *-ro* marked *har -i* DPs, then, is as in (290), where it is assumed that *-ro* takes scope over the NP only. It denotes the set of properties that are true of at least one plural individual in the singleton subset of the domain returned by f that has property P.

(290) $[\![\text{har [ro}_i\text{[NP-i(D)]]}]\!] = \lambda f_{\langle e,t\rangle} : \textsc{singleton}(f).\lambda P_{\langle e,st\rangle}.\lambda w.\exists x \left[(f([\![NP]\!]^w))(x) \wedge \textsc{plural}(x) \wedge \mathbf{D}_w(x) \wedge \forall y_{at} \sqsubseteq x[P_w(y)]\right]$

Under this proposal, as we will see in 4.4.2.2, *har -i* DPs are expected to lose their FCI behavior when combined with accusative marker *-ro*.

4.4.2.2 Account

Adopting the theory of FCI in Chierchia 2013, in Section 4.3, we argued that *har -i* DPs are existential quantifiers that require at least one plural individual in the extension of the NP to have the VP property. On top of their existential quantifications, they introduce scalar and pre-exhaustified domain alternatives that must be excluded, if they are stronger than the basic existential claim, through exhaustivity operators. Under this analysis, the distribution and interpretation of *har -i* DPs follows from the clash

[27] See López 2012 for the claim that *-ro* and other differential object markers introduce a free variable ranging over choice functions. In (289), $i_{\langle et,et\rangle}$ is a free variable that *ro* takes as argument. We use boldface type to represent the value of variables.

between scalar and domain implicatures. We will show that this clash disappears in the case of *har -i* DPs marked with *-ro*. Once the domain of the existentials is restricted to a singleton, the domains with just one atomic individual lead to contradictions, and those containing a plural individual each yield a proposition corresponding to a possible assertion. Consequently, as we will see shortly, the alternatives are not excludable, since they would be equivalent to the assertion.

To illustrate, consider the sentence in (291), repeated from (281), with the LF in (292-a).

(291) Roya har ketab-i ro xund.
Roya each book-IND ACC read-3.SG
'Roya read each book (in a certain group of books).'

The LF in (292-a) has the representation in (292-b). This representation has a free variable f ranging over singleton domain selection functions. The proposition that (292-b) denotes results from the subset selection function f picking out a singleton set from the extension of *book*. To know the proposition, we need to know the value for the free variable f.

(292) a. LF: har [ro_i [book -i]] $\lambda 1$ [Roya read t_1]

b. $\lambda w.\exists x[x \in f([\![book]\!]^w) \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R,y)]]$

Assuming that the extension of NPs can include both atomic and plural individuals, the extension of *book* will be as in (293), when there are three books, b_1, b_2, and b_3, in the world of evaluation.

(293) $[\![book]\!]^w = \{b_1, b_2, b_3, b_1 \oplus b_2, b_1 \oplus b_3, b_2 \oplus b_3, b_1 \oplus b_2 \oplus b_3\}$

The subset selection function f has a singleton constraint requiring that the cardinality of $f([\![book]\!]^w)$ equals one. There are, then, two types of values for the singleton domain selection function: (i) a singleton subset containing an atomic individual, (ii) a singleton subset containing a plural individual.

The singleton subsets that contain an atomic individual are ruled out as possible

values for the subset selection function because they will yield a contradiction. As said before, *har -i* DPs require at least one plural individual in the extension of the NP to have the VP property. This requirement cannot be satisfied, when considering the atomic individuals alone, since no atomic individual is a plurality. This can be illustrated with the help of the example in (294). Suppose that the singleton domain contains the atomic individual b_1. This domain will lead to the proposition in (294) that there is a plural individual x in $\{b_1\}$ that Roya read. The domain doesn't contain any plural individual, the proposition, thus, is a contradiction. Therefore, such propositions expressed based on singleton subsets containing atomic individuals are ruled out as possible assertions.

(294) $\lambda w.\exists x[x \in \{b_1\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R, y)]]$

Let's move on to the second possibility as a type of value for f, which is a singleton subset containing a plural individual. Since there are four singleton subsets of the domain in (293) that passes the plurality requirement of the *har -i* DP, meaning that each singleton subset contains a plural individual, as illustrated in (295), there are four possible values for f, and, therefore, (292-a) can denote any of the four propositions in (296).

(295) $\{b_1 \oplus b_2\}, \{b_1 \oplus b_3\}, \{b_2 \oplus b_3\}, \{b_1 \oplus b_2 \oplus b_3\}$

(296) a. $\lambda w.\exists x[x \in \{b_1 \oplus b_2\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R, y)]]$

b. $\lambda w.\exists x[x \in \{b_1 \oplus b_3\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R, y)]]$

c. $\lambda w.\exists x[x \in \{b_2 \oplus b_3\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R, y)]]$

d. $\lambda w.\exists x[x \in \{b_1 \oplus b_2 \oplus b_3\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R, y)]]$

Now that we know the possible assertions that the speaker could have asserted, we need to determine the alternatives. Let's start with the domain and the pre-exhaustified domain alternatives. As said before, the domain alternatives result from restricting the domain to any of its subsets. Because the domains are already singleton sets, for each of the possible assertions in (296), the only possible subdomains to consider are improper subdomains which are equivalent to the original domains in (295). Therefore, the domain alternative for each assertion in (296) would be equivalent to that assertion.

Furthermore, since, for each possible assertion, there is only one domain alternative, there will be one pre-exhaustified domain alternative, which would be equivalent to the domain alternative. Theses alternatives would then be as in (297).

(297) a. $\{\lambda w.\exists x[x \in \{b_1 \oplus b_2\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R,y)]]\}$

b. $\{\lambda w.\exists x[x \in \{b_1 \oplus b_3\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R,y)]]\}$

c. $\{\lambda w.\exists x[x \in \{b_2 \oplus b_3\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R,y)]]\}$

d. $\{\lambda w.\exists x[x \in \{b_1 \oplus b_2 \oplus b_3\} \wedge \textsc{plural}(x) \wedge \forall y_{at} \sqsubseteq x[\textsc{read}_w(R,y)]]\}$

For each possible assertion in (296), its pre-exhaustified domain alternative is also equivalent to its scalar alternative. When there is only one plurality in the domain, as seen in (295), if Roya read each book in that plurality, she must have read each book in every plurality in the domain and viceversa, as captured in (298-b).

(298) a. $\{b_1 \oplus b_2, b_1 \oplus b_3, b_2 \oplus b_3, b_1 \oplus b_2 \oplus b_3\}$

b. $\forall x \in$ (298-a)
$[\lambda w.\exists y \in \{x\} \forall z_{at} \sqsubseteq y[\textsc{read}_w(R,z)] \Leftrightarrow \lambda w.\forall y \in \{x\} \forall z_{at} \sqsubseteq y[\textsc{read}_w(R,z)]$

For each possible assertion, then, the alternatives, scalar and pre-exhaustified domain alternatives, are equivalent to the assertion itself, and therefore, they are non-excludable. This means that in the complete LF of (292-a), in (299) below, exhaustification is vacuous: it simply returns the argument of O_{ALT}. Depending on the value of the singleton subset selection function introduced by *-ro*, the argument of O_{ALT} will be one of the propositions in (296) (assuming we are excluding possible values for the singleton subset selection function that will yield a contradiction). The LF in (299) will then convey that Roya read each book in a certain group of books. We then capture the attested contextually restricted universal force of *har -i* DPs modified by *-ro* and the lack of counterfactual inferences. *Har -i* DPs modified by *-ro* are simply specific plural distributive indefinites. We then also expect them to license discourse anaphora, as attested.

(299) LF: O_{ALT} har [ro_i [book -i]] $\lambda 1$ [Roya read t_1]

4.4.3 Interim summary

In this section, we have seen that *har -i* DPs lose their FCI status when they are marked with the accusative marker *-ro*. We argued that taking *ro* as a subset selection function that returns a singleton subset of the set it applies to makes the alternatives equivalent to the assertion, therefore not excludable, then, can explain the distribution and interpretation *har -i* DPs marked with *-ro*.

4.5 Conclusion

Under the Wide Scope Constraint Analysis of FCIs presented in Chierchia 2013, UFCIs in non DE contexts derive a pathological meaning, a contradiction, which results from negating the scalar and pre-exhaustified alternatives that these items introduce into the semantic derivation. With modals, this contradiction is avoided by resorting to a stipulation that requires the modal domain of the modal component in the scalar alternative to be contained within the modal domain of the modal component in the domain alternatives, but only with possibility modals. Avoiding the derivation of a pathological meaning determines then the distribution and interpretation of FCIs. If our analysis is on the right track, the combination of the accusative marker *-ro* with Farsi *har -i* DPs illustrates another possibility: the pathological meaning can be avoided by neutralizing the alternatives. In the case of *har -i* DPs marked with *-ro*, a certain morphological configuration can conspire to neutralize FCI status by delivering alternatives equivalent to the assertion (which O_{ALT} ignores) or express a contradiction (and can therefore be excluded without consequences). The situation is similar to that discussed in Alonso-Ovalle and Menéndez-Benito 2011 for Spanish *algún*, where plurality also delivers alternatives equivalent to the assertion. Consequently, this chapter addressed the second question posed in the introductory chapter: In which ways can the derivation of a contradiction be avoided?

We now end the chapter with the following two remarks.

4.5.1 *Yek -i* DPs with *-ro*

In Chapter 2, we saw that *yek -i* DPs are EFCIs. Just like *har -i* DPs , *yek -i* DPs lose their FCI status when they combine with the accusative marker *-ro*. As seen before, when interpreted under modals, both possibility and necessity modals, *yek -i* DPs, like other EFCIs, trigger a free choice effect. For instance, the sentence in (300), with a *yek -i* DP under a possibility modal, conveys that Roya is allowed to read any book, and, therefore, is false in the scenario in (301). The sentence in (302), with a *yek -i* DP under a necessity modal, conveys that Roya is required to read a book, and that any book is permitted option. Therefore, the sentence is false in the scenario in (303).

(300) Roya mitun-e ye ketab-i bexun-e.
Roya can-3.SG one book-IND read-3.SG
'Roya can read any book.'

(301) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Roya is not allowed to read b_4 or b_5.

(302) Roya bayad ye ketab-i bexun-e.
Roya must one book-IND read-3.SG
'Roya must read a book–any book.'

(303) *Scenario:* There are only five books ($\{b_1, \ldots b_5\}$). Roya is required to read a book, but he is not allowed to read b_4 or b_5.

The free choice effect, however, disappears, when *yek -i* DPs combine with *-ro*. To illustrate this, consider the counterpart of the sentences in (300) and (302) with *-ro*. The sentence in (304), unlike its counterpart without *-ro* in (300), does not convey a free choice effect: it claims that there is a certain book that Roya is allowed to read, not that she is allowed to read any book. Likewise, the sentence in (305), unlike its counterpart without *-ro* in (300), conveys that Roya must read a certain book, not that she must read a book and that she is permitted to read any book.

(304) Roya mitun-e ye ketab-i ro bexun-e.
Roya can-3.SG one book-IND ACC read-3.SG
'Roya is allowed to read a certain book.'

(305) Roya bayad ye ketab-i ro bexun-e.
Roya must one book-IND ACC read-3.SG
'There is a certain book that Roya must read.'

We now illustrate how the current assumption about the semantics of *-ro* works with *yek -i* DPs. According to the analysis of *yek -i* DPs provided in Chapter 2, just like other FCIs, *yek -i* DPs are existential quantifiers that introduce scalar and pre-exhaustified domain alternatives that needs to be exhaustified. We assume, as illustrated in (306), that the extension of NPs can include both atomic and non-atomic individuals, and that singular marking selects the atomic individuals from the extension of the NP (Scontras, 2022). We further assume that *yek -i* DPs require NPs with singular marking which is interpreted in the semantics, as in (307). The denotation of a *yek -i* DP is given in (308): it denotes the set of properties that are true of at least one atomic individual in a given domain D.

(306) $[\![[_{NP}\,\text{book}]]\!]^w = \left\{ \begin{array}{c} b_1, b_2, b_3, \\ b_1 \oplus b_2, b_1 \oplus b_3, b_2 \oplus b_3, b_1 \oplus b_2 \oplus b_3 \end{array} \right\}$

(307) $[\![\text{SG}\,[_{NP}\,\text{book}]]\!]^w = \{b_1, b_2, b_3\}$

(308) $[\![\text{ye SG NP-i(D)}]\!] = \lambda P_{\langle e,st\rangle}.\lambda w.\exists x[[\![\text{SG NP}]\!]^w(x) \wedge |x| \geq 1 \wedge \mathbf{D}_w(x) \wedge P_w(x)]$

The scalar alternatives for *yek -i* DPs, given in (309), result from considering stronger cardinality claims that, for each subdomain $\mathbf{D}'_w$, a larger number of individuals in $\mathbf{D}'_w$ have VP property.

(309) $[\![\text{ye SG NP-i(D)}]\!]^{\sigma\text{-ALT}} =$
$\{\lambda P.\lambda w.\exists x[[\![\text{ NP}]\!]^w(x) \wedge |x| \geq n \wedge \mathbf{D}'_w(x) \wedge P_w(x)] \mid \mathbf{D}'_w \subseteq \mathbf{D}_w \wedge n > 1\}$

The domain alternatives for *yek -i* DPs, in (310), result from replacing $\mathbf{D}_w$ with $\mathbf{D}'_w$, where $\mathbf{D}'_w \subseteq \mathbf{D}_w$, to restrict the domain of quantification to subdomains of $\mathbf{D}_w$.

(310) $[\![\text{ye sG NP-i(D)}]\!]^{\text{D-ALT}} =$

$$\{\lambda P.\lambda w.\exists x[[\![\text{sG NP}]\!]^w(x) \wedge |x| \geq 1 \wedge \mathbf{D}'_w(x) \wedge P_w(x)] \mid \mathbf{D}'_w \subseteq \mathbf{D}_w\}$$

Let us now illustrate how the system works. For this, consider the LF in (311-a) and its representation in (311-b).

(311) a. LF: ye [ro_i [sG book -i]] $\lambda 1$ [Roya read t_1]

b. $\lambda w.\exists x[x \in f([\![\text{book}]\!]^w) \wedge |x| \geq 1 \wedge \textsc{read}_w(R,x)]$

Assuming the domain in (307), there are three singleton subsets, and therefore there are three possible values for the singleton domain selection function. Thus, there are three possible propositions that (311-a) can express. The possible propositions are listed in (312).

(312) a. $\lambda w.\exists x[x \in \{b_1\} \wedge |x| \geq 1 \wedge \textsc{read}_w(R,x)] \Leftrightarrow \lambda w.\textsc{read}_w(R,b_1)$

b. $\lambda w.\exists x[x \in \{b_2\} \wedge |x| \geq 1 \wedge \textsc{read}_w(R,x)] \Leftrightarrow \lambda w.\textsc{read}_w(R,b_2)$

c. $\lambda w.\exists x[x \in \{b_3\} \wedge |x| \geq 1 \wedge \textsc{read}_w(R,x)] \Leftrightarrow \lambda w.\textsc{read}_w(R,b_3)$

Again, the use of a FCI triggers propositional alternatives. Since the domain for each proposition in (312) is a singleton, the set of domain alternatives, which result from restricting the domain to any of its subsets, contains a single proposition. Each possible assertion is therefore equivalent to the proposition expressed by the domain alternative, and, since there is only one alternative, by the pre-exhaustified domain alternative.

The scalar alternatives, where each requires that more than one individual in the domain have the VP property, express a contradiction, as we can see by considering the cases below: for these propositions to map a world to true, it is required that the set of books in a singleton that Roya reads has cardinality two or more. This requirement can never be satisfied, since the domain contains a single individual. Since none of the possible assertions in (312) is a contradiction, they will not entail their scalar alternatives, and, therefore, the scalar alternatives must be negated. Exhaustification, however, does nothing, since the negation of a contradiction is a tautology and conjoining the assertion with a tautology is equivalent to the assertion itself. *Yek -i* DPs modified by *-ro* are simply

singular specific indefinites.

(313) a. $\lambda w.|\{x : x \in \{b_1\} \wedge \textsc{read}_w(R,x)| \geq 2$

b. $\lambda w.|\{x : x \in \{b_2\} \wedge \textsc{read}_w(R,x)| \geq 2$

c. $\lambda w.|\{x : x \in \{b_3\} \wedge \textsc{read}_w(R,x)| \geq 2$

In short, assuming that *-ro* enforces maximal domain restriction can also explain the lack of FCI behavior of *yek -i* DPs modified by *-ro*

4.5.2 *Har -i* DPs in DE contexts

We now explore one consequence of the current analysis by focusing on the behaviour of UFCIs in DE contexts. In DE contexts, UFCIs split (Chierchia 2013): some, like *any* DPs are licensed and have existential force, as in (314-a), with a sentential negation, and (314-b), with the DE operator *doubt*; others, like Italian *qualsiasi* or *qualunque*, in contrast, are deviant in DE contexts, as the pair of sentences in (315), with *qualunque*, show.

(314) a. Mary didn't read any book.

b. I doubt that Mary has read any book.

(315) a. *Lea non legge qualunque libro.
lea not read QUALUNQUE book
'Lea doesn't read any book.' (Chierchia 2013, 341)

b. *Dubito che Gianni abbia visto qualunque studente.
doubt that Gianni have seen QUALUNQUE student
'I doubt that Gianni has seen any student.' (Chierchia 2013, 342)

The behavior of Farsi *har -i* DPs in DE contexts resembles that of Italian *qualsiasi* and *qualunque*: they are not licensed in DE contexts, as we can see in the sentences in (316) and (317).[28]

[28]If *har -i* DPs are focused, they are licensed in DE contexts and receive a 'not just any' interpretations, just like focused *qualsiasi and qualunque*(Chierchia 2013). In this case, (316), for instance, conveys that Roya didn't read just any book.

(316) *Roya har ketab-i na-xund.
Roya HAR book-IND NEG-read-3.SG
'Roya didn't read any book.' (Alonso-Ovalle and Moghiseh 2019b, p. 691)

(317) *shak dar-am Roya har ketab-i xunde bash-e.
doubt have-1.SG Roya HAR book-IND read be-3.SG
'I doubt that roya has read any book.'
(Alonso-Ovalle and Moghiseh 2019b, p. 691)

The current analysis of FCIs captures the reading that the sentence in (314-a) has through the LF in (318-a). The scalar alternative in (318-c) is entailed by the assertion in (318-b), and therefore, cannot be excluded. The pre-exhaustified domain alternatives in (318-e) are incompatible with the assertion, and their negation are entailed. Hence exhaustification is vacuous and returns the assertion itself, as (319) shows.

(318) a. LF:$O_{ALT}[_{IP}$ NEG any book$_{[+\sigma,+D]}$ $\lambda 1$ Mary read $t_1]$
b. $[\![[_{IP}\ldots]]\!]$ = $\neg(b_1 \vee b_2)$
c. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}}$ = $\{\neg(b_1 \wedge b_2)\}$
d. $[\![[_{IP}\ldots]]\!]^{\text{D-ALT}}$ = $\{\neg b_1, \neg b_2\}$
e. $[\![[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}}$ = $\{\neg b_1 \wedge b_2, \neg b_2 \wedge b_1\}$

(319) $[\![O_{ALT}[_{IP}\ldots]]\!]$ = $\neg(b_1 \vee b_2)$

To capture the contrast between FCIs in their behavior in DE contexts, Chierchia 2013 assumes that there are two versions of exhaustivity operators, the regular exhaustivity operator (O_{ALT}) and the presuppositional exhaustivity operator (O^{PS}_{ALT}), and that the selection between the two operators is a lexical property of FCIs. The regular exhaustivity operator (O_{ALT}) excludes all non-entailed alternatives. The presuppositional exhaustivity operator (O^{PS}_{ALT}), on the other hand, has a proper strengthening requirement which requires the result of exhaustification to *properly* entail the argument of the exhausivity operator. When this requirement is satisfied, presuppositional exhaustification behaves like regular exhaustification, otherwise, exhaustification is ruled out and the result is ungrammatical. In cases like DE contexts, as in (318), regular exhaustification is vacuous,

as can be seen in (319), and grammatical, since alternatives are entailed or incompatible with the assertion which are, then, entailed, when negated. For this particular reason, the proper strengthening requirement cannot be satisfied in DE contexts. The presuppositional exhaustification, therefore, is undefined and the result is ungrammatical.

Chierchia 2013 hypothesizes that FCI like English *any* that are grammatical in DE contexts go with regular exhaustification, and those like Italian *qualsisai* and *qualunque* that are ungrammatical in DE contexts go with proper strengthening exhaustification. Needless to say, we can pursue the same line and assume that *har -i* DPs like *qualsiasi* and *qualunque* select for proper strengthening. The question is whether this is a viable option for us.

Let's start with the basic case. Consider the LF of (316), in (320-a). The argument of the exhaustifier denotes the proposition in (320-b) conveying that no group of books is such that Roya read each of its members. The scalar alternative of the argument of the exhaustifier, in (320-c), is entailed by the assertion, and the pre-exhaustified domain alternatives, in (320-d) are entailed or incompatible with the assertion. The negation of the incompatible alternatives are entailed by the assertion. Exhaustification, therefore, does not strengthen the assertion. Proper strengthening is then violated, and the result is ungrammatical.

(320) a. LF: O^{PS}_{ALT} [$_{IP}$ NEG har book-i λ 1 Roya read t_1]

b. $[\![[_{IP}\ldots]]\!] = \neg[(b_1 \wedge b_2) \vee (b_2 \wedge b_3) \vee (b_1 \wedge b_3)]$

c. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \neg[(b_1 \wedge b_2) \wedge (b_2 \wedge b_3) \wedge (b_1 \wedge b_3)]$

d. $[\![[_{IP}\ldots]]\!]^{\text{D-ALT}} = \left\{ \begin{array}{c} \neg(b_1 \wedge b_2) \wedge \neg(b_2 \wedge b_3) \wedge \neg(b_1 \wedge b_3), \\ \neg(b_1 \wedge b_2) \wedge \neg(b_2 \wedge b_3) \wedge (b_1 \wedge b_3) \\ \neg(b_1 \wedge b_2) \wedge (b_2 \wedge b_3) \wedge \neg(b_1 \wedge b_3), (b_1 \wedge b_2) \wedge \neg b_3, \\ (b_2 \wedge b_3) \wedge \neg b_1, (b_1 \wedge b_3) \wedge \neg b_2 \end{array} \right\}$

While the proper strengthening requirement can account for the behavior of *har -i* DPs in DE contexts, it conflicts with our account for the loss of FCI status of *har -i* DPs combined with *-ro*. As we saw before, *har -i* DPs lose their FCI status when they are marked with the accusative marker *-ro*. To account for this, we put forward an analysis which relies

on the derivation of alternatives that are equivalent to assertion which then results in vacuous exhaustification. This clearly violates the proper strengthening requirement. To avoid this problem, one possible solution is to assume, as Chierchia 2013 does for other FCIs, that *har -i* DPs require a certain type of exhaustivity operator. The exhaustivity operator that *har -i* DPs select for forces the requirement that the alternatives cannot be weaker than the assertion. In other words, exhaustification is defined only if the alternatives in play are not weaker than the assertion. This requirement explains the deviance of *har -i* DPs in DE contexts, since some, if not all, alternatives are weaker than the assertion, and, therefore, exhaustification is undefined. At the same time, it is compatible with our explanation for the loss of FCI status of *har -i* DPs marked with *-ro*, since, in those cases, the alternatives are equivalent to the assertion, and, therefore, not weaker than the assertion. Under this new assumption, the explanation for the lack of NPI readings is shifted from the output of exhaustification to possible alternative inputs. The exploration of this possibility has to be left for future research.

Chapter 5

Obligatory wide scope: Farsi *har -i* DPs

5.1 Introduction

We know form prior chapters that EFCIs and UFCIs differ in their distributions. Focusing on modal contexts, we have seen that UFCIs are deviant in sentences containing necessity modals, as in (321). EFCIs, in contrast, are licensed and convey an existential force with a free choice reading, as in (322).

(321) *Mary must read any book.

(322) Mary muss irgendeinen Arzt heiraten.
Mary has-to IRGENDEIN doctor marry
'Mary has to marry a doctor—any doctor.'

(Kratzer and Shimoyama, 2002, P. 11)

What underlies this contrast? Addressing this question, as previously discussed , Chierchia 2013 posits that UFCIs are subject to the Wide Scope Constraint requiring them to scope over modals. This requirement, when exhaustification is applied, necessarily leads to the grammatical derivation of a contradiction with necessity modals, as illustrated in (323-b). The assertion, the first conjunct, together with the domain implicature, the third conjunct, conveys that Mary reads all books in all permitted worlds. This contradicts the scalar implicature, the second conjunct, which conveys that Mary does not read all books in all permitted worlds.

(323) a. LF: O_{ALT}[$_{IP}$ any$_{[+\sigma,+D]}$book $\lambda 1$ $\Box$ [Mary read t_1]]

b. $[\![$(323-b)$]\!]$ = $(\Box b_1 \vee \Box b_2) \wedge \neg(\Box b_1 \wedge \Box b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2) \Leftrightarrow \bot$

EFCIs, in contrast, can scope under modals, as in (324-a). Exhaustification, in this case, yields the attested free choice effect. The proposition in (324-b) conveys that Mary is required to marry a doctor, and that any doctor is a permitted option.

(324) a. LF: $O_{ALT}\Box$ [$_{IP}$ irgendeinen$_{[+\sigma,+D]}$doctor $\lambda 1$ Mary marry t_1]

b. $[\![$(324-a)$]\!]$ = $\Box(d_1 \vee d_2) \wedge \neg\Box(d_1 \wedge d_2) \wedge (\Box d_1 \leftrightarrow \Box d_2)$
$\Leftrightarrow \Box(d_1 \vee d_2) \wedge \neg\Box(d_1 \wedge d_2) \wedge \Diamond d_1 \wedge \Diamond d_2$

Another question arises: why do EFCIs and UFCIs differ in their scope with respect to modals. Chierchia 2013 addresses this question with the help of construction where UFCIs combine with number morphology, specifically focusing on the numeral counterparts of *any* DPs ('numeral *any*').

As reported in the literature, numeral *any*, like '*any two books*', unlike their counterparts without numerals, are licensed with necessity modals and trigger a free choice effect (Dayal 2005, 2013; Chierchia 2013). For instance, the counterpart of the sentence in (321) with a numeral *any*, given in (325), claims that Mary must read two books, and that every two books is a permitted option.

(325) Mary must read any two books.

To capture the contrast between *any* DPs and their numeral counterparts, Chierchia posits that the numeral component prompts the wide scope construal to be violated while permitting the narrow scope construal. Chierchia hypothesizes that FCIs, by default, take scope over modals. However, when these items belong to a scale comprising more than two members, like numerals which form a scale of the form <one, two, three,... >, they take scope under modals. This applies to items that are associated with numeric scale, like EFCIs and the numeral counterparts of UFCIs.

This expands the empirical investigation to Farsi, revealing that the contrast observed between UFCIs and their numeral counterparts might not universally hold. The presence

of the numeral component does not affect the distribution of *har -i* DPs: *har -i* DPs, which, as we saw in the previous chapter, pattern with other UFCIs, and their numeral counterpart ('numeral *har*') pattern alike. Unlike numeral *any*, but just like plain *any* DPs and *har -i* DPs, numeral *har* is deviant in sentences containing a necessity modal, as (326) shows.

(326) * Roya bayad har do ta ketab-i bexun-e.
Roya must HAR two CL book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2021, p. 488)

To explain this contrast, we propose that *har -i* DPs do not tolerate scoping under modals, i.e., their scope is restricted.

To end the chapter, we review an alternative analysis of the contrast between *any* DPs and numeral *any*, the Viability Constraint Analysis (Dayal 2013), and show that how this analysis can be extended to the contrast under discussion. Then, we compare the two analysis in their predictions with respect to sentences containing collective predicates.

The rest of the chapter is organized as follows. Section 5.2 focuses on numeral counterpart of FCIs, in particular English numeral *any* and Farsi numeral *har*, documenting a contrast between English and Farsi. We will then explore how the Wide Scope Constraint Analysiscan capture the contrast under discussion, with minimal assumption. Section 5.3 reviews the Viability Constraint Analysis and shows how a minimal extension to it can capture the contrast between English and Farsi. Section 5.4 evaluates the different predictions made by each analysis, the Wide Scope Constraint Analysis and the Viability Constraint Analysis, with respect to examples containing collective predicates. Finally, Section 5.5 concludes the discussion.

5.2 Numeral FCIs

This section deals with numeral FCIs, constructions where UFCIs combine with number morphology, and in particular the numeral counterparts of *any* DPs and *har -i* DPs. Both *any* DPs and *har -i* DPs can combine with a numeral forming, what we refer to

as, 'numeral *any*' and 'numeral *har*'. Section 5.2.1 starts by showing a contrast between *any* DPs and numeral *any* in their distribution, and then documents a contrast between numeral *any* and its counterpart in Farsi, numeral *har*. Section 5.2.2 reviews how the Wide Scope Constraint Analysis of UFCIs captures the contrast between *any* DPs and numeral *any*. Section 5.2.3 discusses how a minimal change in the Wide Scope Constraint Analysis can account for the contrast between numeral *any* and numeral *har*. Section 5.2.4 assesses the predictions of minimally modified Wide Scope Constraint Analysis with respect to imperatives. Section 5.2.5 summarizes the discussion in the present section.

5.2.1 A contrast: Numeral *any* vs. Numeral *har*

The distribution of plain *any* DPs differ from that of numeral *any*. Like *any* DPs, numeral *any* is deviant in positive episodic sentences, as in (327-a) and (328-a), but licensed in sentences containing a possibility modal, as seen in (327-b) and (328-b), and convey a free choice effect, as EFCIs do. (327-b) conveys that Mary is allowed to buy a book and that every book is a permitted option, and (328-b) conveys that Mary is allowed to buy two books and that every two books is a permitted option.

In sentences containing a necessity modal, numeral *any*, unlike *any* DPs, is licensed, as (327-c) and (328-c) show, and conveys a free choice effect (Dayal 2005, 2013; Chierchia 2013). (328-c) claims that Mary must read two books and that every two books is a permitted option.

(327) a. *Mary read any book.
b. Mary can read any book.
c. *Mary must read any book.

(328) a. *Mary read any two books.
b. Mary can read any two books.
c. Mary must read any two books.

The contrast between *any* DPs and numeral *any*, however, is not detectable between their

counterparts in Farsi. As we have seen, *har -i* DPs pattern with *any* DPs. Just like *any* DPs, *har -i* DPs are deviant in positive episodic sentences, (329), and in sentences containing a necessity modal, (331), but licensed in sentences containing a possibility modal, (330), where they convey a free choice effect.

(329) *Roya har ketab-i xund.
Roya HAR book-IND read-3.SG

(330) Roya mitun-e har ketab-i bexun-e.
Roya can-3.SG HAR book-IND read-3.SG
'Roya can read any book.'

(331) *Roya bayad har ketab-i bexun-e.
Roya must HAR book-IND read-3.SG

Unlike in the case of *any* DPs, the distribution of *har -i* DPs is not sensitive to whether they combine with a numeral: numeral *har* and plain *har -i* DPs pattern alike. Numeral *har* is deviant in positive episodic sentences, as in (332), but licensed in sentences containing a possibility modal, as seen in (333). Unlike numeral *any*, but just like plain *any* DPs and *har -i* DPs, numeral *har* is deviant in sentences containing a necessity modal, as (334) shows.[29]

(332) * Roya har do ta ketab-i xund.
Roya HAR two CL book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2021, p. 488)

(333) Roya mitun-e har do ta ketab-i bexun-e.
Roya can-3.SG HAR two CL book-IND read-3.SG
'Roya can read any two books.' (Alonso-Ovalle and Moghiseh 2021, p. 488)

(334) * Roya bayad har do ta ketab-i bexun-e.
Roya must HAR two CL book-IND read-3.SG
(Alonso-Ovalle and Moghiseh 2021, p. 488)

Like their English counterparts with numeral *any*, the interpretation of sentences with

[29]The contrast between types of modals that we report here was confirmed in a small pilot acceptability rating questionnaire run with nine monolingual Farsi native speakers, belonging to different age groups (from 28 to 51), all from Tehran. In the examples above, the numeral *do* ('two') combines with the classifier *ta*.

possibility modals containing numeral *har* convey a free choice effect: the sentence in (333) claims that Roya is allowed to read two books and that every group of two books is a permitted option, and is therefore false in the scenario in (335).

(335) The Spanish course syllabus lists five groups of two books for students to read ($\{G_1, \ldots G_5\}$). Each group corresponds to a proficiency level. Students are permitted to read any group of books that is at or below their current proficiency level. Roya is in level 3, so she cannot read G_4 or G_5.

A question arises: what determines the contrast between Farsi and English? To answer this question, we start by reviewing in section 5.2.2 how the Wide Scope Constraint Analysis captures the contrast between *any* and numeral *any*. We will then come back to the Farsi data in sections 5.2.3 to discuss how this analysis can be extended to capture the contrast between English and Farsi.

5.2.2 Wide Scope Constraint Analysis

We assume that numerals express properties of individuals, as in (336), where, '$|x|$' yields the number of individuals that x consists of.

(336) $[\![\text{ two }]\!] = \lambda x.|x| \geq 2$

Let's now see how the Wide Scope Constraint captures the behavior of numeral *any*. We start with positive episodic sentences. To illustrate, consider the LF in (337-a) for the sentence in (328-a). Assuming the domain of quantification in (337-b), the IP in (337-a) expresses the proposition in (337-c) that Mary read two or more books.

(337) a. LF:$O_{\text{EXH-D}}$ $O_\sigma[_{\text{IP}}$ [any two books]$_{[+\sigma,+D]}$ λ_1 Mary read t_1]

b. $[\![\text{book}]\!] = \{a, b, c, a \oplus b, b \oplus c, a \oplus c, a \oplus b \oplus c\})$

c. $[\![[_{\text{IP}} \ldots]]\!] = R(a \oplus b) \vee R(b \oplus c) \vee R(a \oplus c) \vee R(a \oplus b \oplus c)$
$(\Leftrightarrow R(a \oplus b) \vee R(b \oplus c) \vee R(a \oplus c))$

The scalar alternative to (337-c), determined by considering a higher value for the numeral, expresses the proposition that Mary read a group of at least three books, in the set in (338-a). The scalar alternative is stronger than the assertion in (337-c), so O_σ excludes it, deriving the proposition in (338-b).

(338) a. $[\![[_{IP}\ldots]]\!]^{\sigma\text{-ALT}} = \{R(a \oplus b \oplus c)\}$

b. $[\![O_\sigma[_{IP}\ldots]]\!] = [R(a \oplus b) \vee R(b \oplus c) \vee R(a \oplus c)] \wedge [\neg R(a \oplus b \oplus c)]$

The domain alternatives to (338-b), given in (339-a), yield the pre-exhaustified domain alternatives in (339-b).[30] These alternatives are stronger than (338-b), so they must get excluded. The pre-exhaustified domain alternatives in (339-b) are related by entailment. Therefore, only the weakest ones needs to be negated, because their negation will entail the negation of the stronger alternatives. The negation of the weaker alternatives in (339-b), which is equivalent to the conditionals in (339-c), put together with the assertion, the first conjunct in (338-b), yields the first conjunct in (340). This, assuming that the extension of the predicate is cumulative, meaning that whenever R is true of x, y, R will be true of the sum of x and y, entails the scalar alternative in (338-a), and therefore contradicts the scalar implicature, the second conjunct in (338-b). Exhaustification, thus, yields a contradiction, as seen in (340). The derivation of a contradiction explains the deviance of numeral *any* in positive episodic sentences.

(339) a. $[\![O_\sigma[_{IP}\ldots]]\!]^{\text{D-ALT}} = \left\{ \begin{array}{l} R(a \oplus b), R(a \oplus c), R(a \oplus c), R(a \oplus b \oplus c), \\ R(a \oplus b) \wedge \neg(R(a \oplus b \oplus c)), \ldots \\ [R(a \oplus b) \vee (R(b \oplus c)] \wedge \neg R(a \oplus b \oplus c) \ldots \end{array} \right\}$

[30] We ignore any subdomain containing only atomic individuals, since these domains derive a contradiction, which the exhaustifier will negate to no effect. Similarly, the 'mixed domains', containing both atomic and non-atomic individuals can be disregarded, since they yield alternatives that are equivalent to those coming from domains containing only plural individuals. In the rest of the paper, we will only consider subdomains closed under sum formation. The alternatives in the first line correspond to the singleton subdomains containing one plural individual. In those cases, the scalar alternative is equivalent to the assertion, and therefore, scalar exhaustification is trivial.

b. $[\![O_\sigma[_{IP}\ldots]]\!]^{\text{EXH-D-ALT}} =$

$$\left\{\begin{array}{l} R(a \oplus b) \wedge \neg R(a \oplus c) \wedge \neg R(b \oplus c), \\ R(a \oplus c) \wedge \neg R(b \oplus c) \wedge \neg R(a \oplus b), \\ R(b \oplus c) \wedge \neg R(a \oplus c) \wedge \neg R(a \oplus b), \\ [R(a \oplus b) \vee R(a \oplus c)] \wedge \neg R(b \oplus c), \\ [R(a \oplus c) \vee R(b \oplus c)] \wedge \neg R(a \oplus b), \\ [R(b \oplus c) \vee R(a \oplus b)] \wedge \neg R(a \oplus c) \end{array}\right\}$$

c.

$$\left\{\begin{array}{l} [R(a \oplus b) \vee (R(a \oplus c)] \rightarrow R(b \oplus c), \\ [R(a \oplus c) \vee (R(b \oplus c)] \rightarrow R(a \oplus b), \\ [R(b \oplus c) \vee (R(a \oplus b)] \rightarrow R(a \oplus c) \end{array}\right\}$$

(340) $[\![O_{\text{EXH-D}}\ O_\sigma[_{IP}\ldots]]\!] = \quad [R(a \oplus b) \wedge R(b \oplus c) \wedge R(a \oplus c)] \wedge \neg R(a \oplus b \oplus c) \Leftrightarrow \bot$

Let's move on to modal contexts. Recall that the Wide Scope Constraint Analysis assumes that UFCIs must scope over modals, and that Modal containment requires the modal domain for the scalar implicature to be a proper subset of the modal domain for the domain implicature.

When numeral *any* combines with a possibility modal, this setup derives a contingent meaning. To illustrate, consider the LF in (341-a) for the sentence in (328-b). The free variables C represents the modal base for the domain implicature, and C′ represents the modal base for the scalar implicature. The assertion together with the domain implicature amounts to the first conjunct in (341-b). This conjunct is consistent with the second conjunct in (341-b). The derived meaning in (341-b) is true in the model in (341-c), when the value of C is $\{w_1, w_2, w_3\}$ and the value of C′ is $\{w_1\}$, and conveys the attested free choice effect.

(341) a. LF:$O_{\text{EXH-D}}\ O_\sigma[_{IP}$ [any two books]$_{[+\sigma,+D]}\lambda_1 \Diamond$ Mary read t_1]

b. $[\![$ (341-a)$]\!] = \quad [\Diamond_C R(a \oplus b) \wedge \Diamond_C R(b \oplus c) \wedge \Diamond_C R(a \oplus c)] \wedge \neg\Diamond_{C'} R(a \oplus b \oplus c)$

c.

w_1	$R(a \oplus b) \wedge \neg R(a \oplus b \oplus c)$
w_2	$R(b \oplus c) \wedge \neg R(a \oplus b \oplus c)$
w_3	$R(a \oplus c) \wedge \neg R(a \oplus b \oplus c)$

This setup, however, derives a contradiction when numeral *any* combines with a necessity modal. Consider the LF in (342-a) for the sentence in (328-c). The assertion together with the domain implicature yields the first conjunct in (342-b) conveying that Mary reads all books in all permitted worlds in C. This is inconsistent with the scalar implicature, the second conjunct in (342-b), for any subset of C.

(342) a. LF:$O_{\text{EXH-D}}$ $O_{\sigma}[_{\text{IP}}$ [any two books]$_{[+\sigma,+\text{D}]}\lambda_1 \Box$ Mary read t_1]

b. $[\![$ (342-a)$]\!]$ =

$$[\Box_C R(a \oplus b) \wedge \Box_C R(b \oplus c) \wedge \Box_C R(a \oplus c)] \wedge \neg\Box_{C'} R(a \oplus b \oplus c) \Leftrightarrow \bot$$

The derivation of a contradiction does not align with the distribution of numeral *any* when they occur in sentences containing a necessity modal. This setup, with wide scope numeral *any* yields a contradiction in episodic sentences, matching the deviance of numeral *any* in these contexts, and a contingent meaning in sentences containing a possibility modal, again matching the attested distribution in these contexts. But it yields a contradiction in sentences containing a necessity modal, where it is licensed. To capture the attested distribution, the Wide Scope Constraint Analysis assumes that exhaustification is subject to an interpretation constraint which can override the Wide Scope Constraint. What motivates this constraint is that the Wide Scope Constraint disregards the numeral component of numeral *any*. This is based on the following observation. With wide scope construals, numeral *any* regardless of the numeral component, would always have the *same* meaning under the distributive interpretation of the predicate. To illustrate this observation, consider (343) and (340), repeated below in (344).

(343) $[\![O_{\text{EXH-D}}\ O_{\sigma}[_{\text{IP}}$ [any one book]$_{[+\sigma,+\text{D}]}$ λ_1 Mary read $t_1]]\!]$ =
$[R(a) \wedge R(b) \wedge R(c)] \wedge \neg R(a \oplus b \oplus c)$

(344) $[\![O_{\text{EXH-D}}\ O_{\sigma}[_{\text{IP}}$ [any two books]$_{[+\sigma,+\text{D}]}$ λ_1 Mary read $t_1]]\!]$ =
$[R(a \oplus b) \wedge R(b \oplus c) \wedge R(a \oplus c)] \wedge \neg R(a \oplus b \oplus c)$

The assertion conjoined with the domain implicature yields the first conjunct in (343) and (344), which are equivalent, because the predicate is distributive and cumulative. With a

distributive predicate, the same pattern holds for any other numeral: the assertion and the domain implicature together , when replacing the numeral in (344), would always yield a proposition equivalent to the first conjunct in (343), which is always inconsistent with the corresponding scalar implicature (the second conjunct). The same holds when numeral *any* combines with a necessity modal: the first conjunct in (345) and (342-b), repeated below in (346), are equivalent, and it is true for any other numeral.

(345) $[\![\text{O}_{\text{EXH-D}}\ \text{O}_{\sigma}[_{\text{IP}}\ [\text{any one book}]_{[+\sigma,+\text{D}]}\lambda_1 \Box\ \text{Mary read}\ t_1]]\!] =$
$[\Box_C R(a) \wedge \Box_C R(b) \wedge \Box_C R(c)] \wedge \neg\Box_{C'} R(a \oplus b \oplus c)$

(346) $[\![\text{O}_{\text{EXH-D}}\ \text{O}_{\sigma}[_{\text{IP}}\ [\text{any two books}]_{[+\sigma,+\text{D}]}\lambda_1 \Box\ \text{Mary read}\ t_1]]\!] =$
$[\Box_C R(a \oplus b) \wedge \Box_C R(b \oplus c) \wedge \Box_C R(a \oplus c)] \wedge \neg\Box_{C'} R(a \oplus b \oplus c)$

With possibility modals, however, the situation is different: the first conjunct in (348), repeated from (341-b), entails (347), but not vice versa.

(347) $[\![\text{O}_{\text{EXH-D}}\ \text{O}_{\sigma}[_{\text{IP}}\ [\text{any one book}]_{[+\sigma,+\text{D}]}\lambda_1 \Diamond\ \text{Mary read}\ t_1]]\!] =$
$[\Diamond_C R(a) \wedge \Diamond_C R(b) \wedge \Diamond_C R(c)] \wedge \neg\Diamond_{C'} R(a \oplus b \oplus c)$

(348) $[\![\text{O}_{\text{EXH-D}}\ \text{O}_{\sigma}[_{\text{IP}}\ [\text{any two books}]_{[+\sigma,+\text{D}]}\lambda_1 \Diamond\ \text{Mary read}\ t_1]]\!] =$
$[\Diamond_C R(a \oplus b) \wedge \Diamond_C R(b \oplus c) \wedge \Diamond_C R(a \oplus c)] \wedge \neg\Diamond_{C'} R(a \oplus b \oplus c)$

So, apparently, the numeral is redundant and semantically vacuous in episodic sentences and in sentences containing a necessity modal. This motivates the Scale Economy Constraint, given in (349).

(349) *The Scale Economy Constraint*
* $[\ \text{O}\ \text{FCI}_i \ldots]$ if $\text{FCI}_i \in \langle \text{FCI}_1 \ldots \text{FCI}_n \rangle (n{>}2)$ and $\forall j (1 \leq j \leq n)$
$[\![[\ \text{O}\ \text{FCI}_i \ldots]\ ]\!] = [\![[\ \text{O}\ \text{FCI}_j \ldots]\ ]\!]$ (Chierchia, 2013, p. 333)

This constraint states that exhaustification is undefined if for all items, in this case FCIs, belonging to a rich scale (scales with more than two members) exhaustification delivers a similar meaning for all of them. Such situations, which cause loss of lexical meanings,

lead to the violation of the Scale Economy Constraint.

Given the Scale Economy Constraint, Chierchia 2013 hypothesizes that all FCIs are subject to the Wide Scope Constraint, unless they belong to a scale with more than two members. If they do, their wide scope construal over modals will be ruled out to avoid the violation of the Scale Economy constraint and, then, the narrow scope construal will be ruled in as the only option. With the help of this hypothesis, Chierchia 2013 not only explains why EFCIs, like Italian *un NP qualsiasi* or German *irgendein*, on the assumption that the numerals in their construction form a rich scale, allow for narrow scope construal over modals, and but also explains the attested distribution of numeral *any*.

Let's see how the Wide Scope Constraint Analysis captures the distribution of numeral *any* with the help of the Scale Economy constraint. Based on what we have seen, the Scale Economy Constraint is relevant when numeral *any* occurs in positive episodic sentences and in sentences containing a necessity modal. In positive episodic sentences, as one would expect, the violation of the Scale Economy constraint is inevitable, exhaustification, therefore, is undefined. This corresponds to the deviance of numeral *any* in these contexts.

In sentences with a necessity modal, however, the situation is different. As we have seen, the wide scope construal of numeral *any* over necessity modals derives a contradiction and violates the Scale Economy Constraint, as (350), repeated from (342), shows.

(350) a. LF:$O_{\text{EXH-D}}$ O_{σ}[$_{\text{IP}}$ [any two books]$_{[+\sigma,+\text{D}]}$$\lambda_1$ $\Box$ Mary read t_1]

b. $[\![$ (350-a) $]\!]$ =

$$[\Box_C R(a \oplus b) \wedge \Box_C R(b \oplus c) \wedge \Box_C R(a \oplus c)] \wedge \neg\Box_{C'} R(a \oplus b \oplus c) \Leftrightarrow \bot$$

The violation of the Scale Economy Constraint and the derivation of a contradiction can be avoided by letting numeral *any* scope under the modal—at the cost of violating the Wide Scope Constraint. In this case, the resulting meaning is not contradictory, and it does not violate the Scale Economy Constraint. Let's provide an illustration. The Scale Economy Constraint rules out the LF in (350-a) and rules in the one in (351-a). Conjoining the assertion with the scalar implicature leads to the conjunction in (351-b).

(351) a. LF:$O_{\text{EXH-D}}$ $O_\sigma\Box[_{\text{IP}}$ [any two books]$_{[+\sigma,+D]}\lambda_1$ Mary read t_1]

b. $[\![O_\sigma\Box[_{\text{IP}}\ldots]]\!] = \Box_C[R(a \oplus b) \vee R(b \oplus c) \vee R(a \oplus c)] \wedge \neg\Box_{C'}R(a \oplus b \oplus c)$

The set containing the negation of the pre-exhaustified domain alternatives to (351-b) is in (352) below.[31] If (351-b) is true, all the antecedents in these conditionals must be false.[32] The strengthened meaning, in (353), is not a contradiction. It entails that every group of two books is a permitted option for Mary, and is therefore true in the model in (354). Furthermore, this meaning does not violate the Scale Economy Constraint, since it is not equivalent to the meanings that higher or lower numerals would have given rise to.[33]

(352)
$$\left\{\begin{array}{l}
\Box_C R(a \oplus b) \rightarrow [\Box_C(R(b \oplus c) \vee \Box_C(R(a \oplus c)], \\
\Box_C R(a \oplus c) \rightarrow [\Box_C(R(b \oplus c) \vee \Box_C(R(a \oplus b)], \\
\Box_C R(b \oplus c) \rightarrow [\Box_C(R(a \oplus c) \vee \Box_C(R(a \oplus b)], \\
\Box_C[R(a \oplus b) \vee R(b \oplus c)] \rightarrow [\Box_C[R(b \oplus c) \vee R(a \oplus c)] \vee \Box_C[R(a \oplus b) \vee R(a \oplus c)]], \\
\Box_C[R(b \oplus c) \vee R(a \oplus c)] \rightarrow [\Box_C[R(a \oplus b) \vee R(b \oplus c)] \vee \Box_C[R(a \oplus b) \vee R(a \oplus c)]], \\
\Box_C[R(a \oplus b) \vee R(a \oplus c)] \rightarrow [\Box_C[R(a \oplus b) \vee R(b \oplus c)] \vee \Box_C[R(b \oplus c) \vee R(a \oplus c)]]
\end{array}\right\}$$

(353) $[\![(351\text{-a})]\!] = \Box_C[R(a \oplus b) \vee R(b \oplus c) \vee R(a \oplus c)] \wedge \neg\Box_{C'}R(a \oplus b \oplus c) \wedge$
$\neg\Box_C[R(a \oplus b) \vee R(b \oplus c)] \wedge \neg\Box_C[R(a \oplus b) \vee R(a \oplus c)] \wedge \neg\Box_C[R(a \oplus c) \vee R(b \oplus c)]$

[31] We exclude from the set in (352) $\neg\Box R(a \oplus b \oplus c)$, since it is entailed by the proposition in (351-b).

[32] Consider the first three antecedents in (352). If any of these antecedents were true, given the consequences, the second conjunct in (351-b) would be false. Now consider any of the other conditionals, for instance (i) below. Given that the first three antecedents are false, if the antecedent of (i) is true, there will be accessible worlds of two types: worlds where $R(a \oplus b)$ is true, and worlds where $R(b \oplus c)$ are true. If the first disjunct in the consequent is true, any $R(a \oplus b)$ world will have to be a world where $R(a \oplus b \oplus c)$ is true. But in that case it will be true that all worlds are worlds where $R(b \oplus c)$ are true, which contradicts the assumption that the first three antecedents are false. We can reason likewise for the second disjunct—and the same point can be made with any of the other two conditionals with an antecedent containing a disjunction under the scope of the modal.

(i) $\Box_C[R(a \oplus b) \vee R(b \oplus c)] \rightarrow [\Box_C[R(b \oplus c) \vee R(a \oplus c)] \vee \Box_C[R(a \oplus b) \vee R(a \oplus c)]]$

[33] The proposition in (i) will convey that every group of three books is a permitted option. The proposition in (ii) will be true in models where Mary is required not to read two or more books.

(i) $O_{\text{EXH-D}}$ $O_\sigma\Box[_{\text{IP}}$ [any three books]$_{[+\sigma,+D]}\lambda_1$ Mary read t_1]

(ii) $O_{\text{EXH-D}}$ $O_\sigma\Box[_{\text{IP}}$ [any one books]$_{[+\sigma,+D]}\lambda_1$ Mary read t_1]

(354)

w_1	$R(a \oplus b) \wedge \neg R(b \oplus c) \wedge \neg R(a \oplus c)$
w_2	$R(b \oplus c) \wedge \neg R(a \oplus b) \wedge \neg R(a \oplus c)$
w_3	$R(a \oplus c) \wedge \neg R(a \oplus b) \wedge \neg R(b \oplus c)$

We now move on to Farsi numeral *har* and will see how the Wide Scope Constraint Analysis with minimal extension can account for the contrast between numeral *any* and numeral *har*.

5.2.3 Account for numeral *har*

We have seen that Farsi *har -i* DPs and English *any* DPs pattern alike in that they are deviant in positive episodic sentences and in sentences containing a necessity modal, but licensed in sentences containing a possibility modal. Their numeral counter part, in contrast, differ in their distribution. They are both deviant in positive episodic sentences and licensed with possibility modals. The contrast emerges with necessity modals: unlike numeral *any*, numeral *har*, just like their counterpart without numeral, are deviant.

How can the Wide Scope Constraint can be extended to cover the Farsi data and the contrast with English? To explain the behavior of numeral *any*, as we saw in section 5.2.2, the Wide Scope Constraint Analysis assumes that the Wide Scope Constraint *can* be violated under the threat of a violation of the Scale Economy Constraint. Under this assumption, numeral *any* take scope under a necessity modal which derives a contingent meaning. With this in mind, one natural way for the Wide Scope Constraint Analysis to derive the Farsi data would be to assume that, for reasons left unexplored, the violation of the Wide Scope Constraint *cannot* be tolerated in Farsi. Under this assumption, numeral *har* would be analyzed as the plain FCIs, like plain *har -i* DPs or *any* DPs, where they obligatorily take scope over modals. As seen in Section 4.3.1 with plain UFCIs, exhaustification always derives a contradiction which can be avoided by the Modal Containment, but only with possibility modals. This aligns with the acceptability of plain UFCIs in sentences containing a possibility modal, and their deviance in positive episodic sentences and in sentences containing a necessity modal.

As discussed in Section 5.2.2, numeral *any* derives a pathological meaning and vio-

lates the Scale Economy Constraint in positive episodic sentences. The same is true for numeral *har*. When numeral *any* or numeral *har* scope over a necessity modal, they also derive a contradiction, which Modal Containment cannot rescue. The derived meaning violates the Scale Economy Constraint, too. The derivation of a pathological meaning and the violation of the Scale Economy Constraint would correlate with the unacceptability of numeral *har* in positive episodic sentences and in sentences containing a necessity modal. If the Wide Scope Constraint cannot be violated in Farsi, numeral *har* will not be able to scope under the necessity modal, and the deviance of this item with necessity modals, in contrast to English, would be expected. With possibility modals, wide scope numeral *har* does not derive a pathological meaning, and, furthermore, the meaning that it yields does not violate the Scale Economy Constraint. We then expect numeral *har* to be fully acceptable in this environment, just like its English counterpart is.

Assuming that the Wide Scope Constraint can be violated in English but *not* in Farsi derives the basic pattern and capture the contrast between English and Farsi within the Wide Scope Constraint Analysis, then. In the next subsection we are going to probe this assumption by investigation the behavior of *har -i* DPs in imperative sentences. We will see that our assumption about Farsi makes correct predictions in this case, and that the violation of the Wide Scope Constraint cannot be tolerated in Farsi.

5.2.4 Imperatives

In imperative sentences, UFCIs, like *any* or *qualunque*, are licensed and seem to have existential force with a free choice effect. The next two examples below illustrate this. To satisfy the order in (355) the addressee does not need to ask every student. Rather, they need to ask a student and every student is a permitted option. In (356) the addressee does not need to take every number 80 bus. They simply need to take a number 80 bus, and that they are all possible options.

(355) Chiedi a qualunque student.
ask to QUALUNQUE student
'Ask any student.' (Chierchia 2013, p. 326)

(356) To go to the Mile End, take any number 80 bus.

In contrast, *har -i* DPs are deviant with imperatives. The counterpart of (356) with a *har -i* DP, given in (357), shows this.

(357) *Baray-e raftan be Mile End, har otobus-e 80-i savar sho.
for-EZ going to Mile End, HAR bus-EZ 80-IND passanger become-2.PL
'To go to Mile End, take any number 80 bus.'

What can explain the contrast between *har -i* DPs and other UFCIs with imperatives? In the reminder of this subsection, we aim to answer this question.

Chierchia analyzes imperatives as a type of universal modal. The Wide Scope Constraint Analysis always yield a contradiction with universal modals, as we have seen in before in the context of necessity modals. The derivation of a contradiction in such contexts aligns well with the deviance of *har -i* DPs, then, since they are deviant with imperatives, but not with the acceptability of other UFCIs which are licensed under imperatives. Chierchia accounts for the acceptability and existential force of UFCIs in imperative sentences mainly based on syntactic grounds. He argues that the modal of imperatives is located very high in structure and that that disallows Quantifier Rising of FCIs across such high modals. This means that the wide scope construal in (358) for the imperative sentence in (356) is ruled out on the basis of locality constraints.

(358) * O_{ALT} [$_{IP}$ [any N.80 bus]$_{[+\sigma,+D]}$ $\lambda 1$ $\Box$ [take t_1]]

When this happens, the narrow scope construal in (359-a) is ruled in as the only option at the cost of the violation of the Wide Scope Constraint. As seen in Chapter 2, when a modal scopes over the FCI and below the exhaustivity operator, exhaustification is consistent and delivers an existential reading with free choice effect. For a brief illustration, consider the LF in (359-a). Assuming a domain with two number 80 buses($\{b_1, b_2\}$), the assertion, first conjunct, conjoined with the scalar implicature, second conjunct, and the domain implicature, third conjunct, is a contingent proposition: (359-b) conveys that either number 80 bus is a permitted option. This corresponds to the attested interpreta-

tion.

(359) a. O_{ALT} $\Box$ [$_{IP}$ [any N.80 bus]$_{[+\sigma,+D]}$ λ1 take t_1]

b. $[\![$ (359-a) $]\!] = \Box(b_1 \vee b_2) \wedge \neg\Box(b_1 \wedge b_2) \wedge (\Box b_1 \leftrightarrow \Box b_2)$

To explain the acceptability of UFCIs with imperatives, under the assumption that imperatives are a type of universal modal at core, the Wide Scope Constraint Analysis assumes that the Wide Scope Constraint *can* be violated when the syntax bans the wide scope construal of FCIs. In this case, UFCIs receive narrow scope construals, which then would lead to a contingent meaning. If this is so, then why are *har -i* DPs deviant under imperatives? One natural answer to this question is that the violation of the Wide Scope Constraint is not tolerated in the case of *har -i* DPs. With this assumption, *har -i* DPs have to take scope over modals. Now, there are two possible ways to go. One is that imperatives in Farsi also are high modals and the wide scope construal of *har -i* DPs is ruled out by the locality constraint which bans DPs moving across such high modals, just as it is in the case of other UFCIs . What, then, distinguishes *har -i* DPs form other UFCIs is that, in the case of *har -i* DPs, the narrow scope construal, which violates the Wide Scope Constraint is ruled out, because the Wide Scope Constraint cannot be violated in Farsi. Another way to go is that *har -i* DPs can scope over imperative modals. Exhaustification, as seen before with necessity modals, derives a contradiction. Either way accounts for the deviance of *har -i* DPs with imperative sentences. As a result, the contrast between *har -i* DPs and other UFCIs in imperative sentences could be due to whether the Wide Scope Constraint can be violated or not.

5.2.5 Interim summary

This section dealt with a contrast between the numeral counterparts of a variety of UFCIs in English and Farsi, numeral *any* and numeral *har*. We saw that numeral *any*, unlike plain *any* DPs, is licensed with necessity modals. We then saw that numeral *har*, unlike numeral *any*, is deviant with necessity modals mimicking the behavior of plain *har -i* DPs and *any* DPs. To account for the contrast between *any* DPs and numeral *any*, the Wide

Scope Constraint Analysisassumes that the Wide Scope Constraint, which forces FCIs to scope over modals, can be violated under the threat of the violation of the Scale Economy constraint letting the narrow scope construals of FCIs. The Wide Scope Constraint and the Scale Economy Constraint, then, rule out numeral *any* in episodic sentences, but not in sentences containing a possibility or a necessity modal, as desired. To capture the contrast between numeral *any* and numeral *har*, the way that we entertained is that the Wide Scope Constraint Analysis can assume that the Wide Scope Constraint cannot be violated in Farsi.

We turn next to an alternative analysis of the contrast between *any* DPs and numeral *any*, and show how the analysis can be extended to Farsi data.

5.3 A comparison: Viability Constraint Analysis (Dayal 2013)

Section 5.3.1 reviews the Viability Constraint Analysis and shows how this analysis captures the contrast between plain *any* DPs and numeral *any*. Section 5.3.2 discusses how a minimal extension to this analysis can account for the Farsi pattern.

5.3.1 *Any* DPs vs. numeral *any*

Like the Wide Scope Constraint Analysis, the Viability Constraint Analysis presented in Dayal 2013 assumes that *any* DPs are existential quantifiers, and that they trigger pre-exhaustified domain alternatives which are false and, therefore, must be excluded. The Viability Constraint Analysis however, replaces the Wide Scope Constraint, Modal Containment, and Scale Economy constraints in the Wide Scope Constraint Analysis by a single constraint on alternatives requiring the modal base to allow the pre-exhaustified domain alternatives to be possibilities, given in (360) below, rephrased as in (361)[34].

[34]The wording of the constraint in (361) is ours.

(360) *The Viability Constraint*

[...FCI ...] is felicitous iff there exists a model M, world w, and a conversational background g(w), such that each pre-exhaustified alternative is true at w w.r.t to some subset of ∩g(w). (Dayal, 2013, p. 100)

(361)
1. when *any* does not outscope a modal, each pre-exhaustified domain alternative must be true in the world of evaluation,
2. when *any* outscopes a modal with domain C, each pre-exhaustified domain alternative must be true in the world of evaluation when the domain of the modal is restricted to a subset of C.

Let's see how this analysis work. The Viability Constraint cannot be satisfied in cases where *any* is in a positive episodic sentence. To illustrate, consider the sentence in (362-a) with the LF in (362-b). In episodic sentences there is only one accessible world, the world of evaluation. The pre-exhaustified domain alternatives, given in (362-b), are mutually exclusive and, therefore, they cannot all be true in the world of evaluation, for any given world. Consequently, the Viability Constraint cannot be satisfied. This aligns with the deviance of *any* DPs in positive episodic sentences.

(362)
a. * Mary read any book.
b. LF: any book $_D$ λ_1 Mary read t_1 (D= ⟦ books ⟧ = {a,b})
c. R(a) ∨ R(b) (Assertion)
d. {R(a) ∧ ¬R(b), R(b) ∧ ¬R(a)} (Alternatives)

The Viability Constraint also fails when *any* scopes under a modal, either a possibility modal or a necessity modal, as in the LF in (363). The Viability Constraint Analysis assumes that the Viability Constraint is checked at the smallest constituent containing every component of the free choice item, so, with narrow scope *any*, it is checked below the modal. With this in mind, the structure which is checked for the Viability Constraint and the alternatives are equivalent to those in episodic cases. The Viability

Constraint, then, cannot be satisfied, for the reasons mentioned above for the positive episodic sentences. Recall that *any* DPs are licensed with possibility modals but deviant with necessity modals. This aligns with the deviance of *any* with necessity modals but not with its acceptability with possibility modals.

(363) $\Diamond_C$ / $\Box_C$ [any book $_D$ λ_1 Mary read t_1]

For the Viability Constraint to have a chance to be satisfied, *any* has to scope over a modal. When *any* scopes over a possibility modal, as in (364-b), the Viability Constraint can be satisfied. In the model in (365), for instance, when C = $\{w_1, w_2\}$, the assertion in (364-c) will be true while all the alternatives in (364-d) will be false. That is, (364-e), the result of strengthening (364-c) with the negation of the pre-exhaustified alternatives in (364-d) will be true in (365). Moreover, each pre-exhaustified domain alternative in (364-e) can be true when the domain of its modal is a subset of C, for instance when $g(C') = \{w_1\}$ and $g(C'') = \{w_2\}$, so the Viability Constraint is satisfied. This predicts the acceptability of *any* DPs with possibility modals.

(364) a. Mary can read any book.

b. LF: any book$_D$ λ_1 $\Diamond_C$ Mary read t_1

c. $\Diamond_C R(a) \vee \Diamond_C R(b)$ (Assertion)

d. $\{\Diamond_{C'} R(a) \wedge \neg\Diamond_{C'} R(b), \Diamond_{C''} R(b) \wedge \neg\Diamond_{C''} R(a)\}$ (Alternatives)

e. $\Diamond_C R(a) \wedge \Diamond_C R(b)$

(365)

w_1	$R(a) \wedge \neg R(b)$
w_2	$\neg R(a) \wedge R(b)$

The situation changes when *any* scopes over a necessity modal. When the assertion in (366-c) is strengthened with the negation of each pre-exhaustified domain alternative in (366-d), it returns the conjunction in (366-e). If (366-e) is true, then, no pre-exhaustified domain alternative will be true when its modal domain is the value of C or a subset of it. The Viability Constraint,therefore, fails, which explains the deviance of *any* DPs with necessity modals

(366) a. *Mary must read any book.

b. LF: any book$_D$ λ_1 $\Box_C$ Mary read t_1

c. $\Box_C R(a) \vee \Box_C R(b)$ (Assertion)

d. $\{\Box_C R(a) \wedge \neg\Box_C R(b), \Box_C R(b) \wedge \neg\Box_C R(a)\}$ (Alternatives)

e. $\Box_C R(a) \wedge \Box_C R(b)$

Let's move on to numeral *any*. Recall that unlike plain *any* DPs, numeral *any* is licensed with necessity modals. To account for the difference between plain *any* DPs and numeral *any*, the Viability Constraint Analysis—like the Wide Scope Constraint Analysis—assumes that the existential component of *any* scopes under the modal. Unlike the Wide Scope Constraint Analysis, the Viability Constraint Analysis takes numeral *any* to introduce two existentials: one corresponding to the numeral (a generalized quantifier ranging over degrees, in (367)) and the other to *any*. In (368), the numeral moves from a DP internal position (the sister of a covert MANY (369)) over the modal, creating a property of degrees (the property that is true of any d such that in all permitted worlds Bill reads at least one group consisting of exactly d-many books).

(367) $[\![\text{two}]\!] = \lambda P_{\langle d,t\rangle}.\exists d[d = 2 \wedge P(d)]$

(368) $[\![\text{two } \lambda_2 \Box_C \text{ [any } t_2\text{-MANY books}_D \text{] } \lambda_1 \text{ Mary reads } t_1]\!] =$
$\Box_C[R(a \oplus b) \vee R(b \oplus c) \vee R(a \oplus c)]$

(369) $[\![\text{MANY}]\!] = \lambda d.\lambda x.|x| = d$

The truth-conditions for (368) correspond to the truth-conditions that we get for narrow scope numeral *any* under the Wide Scope Constraint analysis (excluding exhaustification.) We also get the same pre-exhaustified alternatives. The Viability Condition is checked at the smallest constituent containing every component of the free choice item, so, in this case, it is checked at the topmost node, because the numeral component takes maximal scope. When the assertion is strengthened with the exclusion of the pre-exhaustified domain alternatives, the Viability Constraint can be satisfied in models like (354), repeated in (370) below, accounting for the acceptability of numeral *any* with

necessity modals.

(370)

w_1	$R(a \oplus b) \wedge \neg R(b \oplus c) \wedge \neg R(a \oplus c)$
w_2	$R(b \oplus c) \wedge \neg R(a \oplus b) \wedge \neg R(a \oplus c)$
w_3	$R(a \oplus c) \wedge \neg R(a \oplus b) \wedge \neg R(b \oplus c)$

Next, we get back to the Farsi data and we will see how the Viability Constraint Analysis can accommodate the Farsi data under minimal modifications.

5.3.2 Back to Farsi data

Recall that unlike plain *any* DPs and numeral *any* that differ in distribution, plain *har -i* DPs and numeral *har* pattern alike. How can the Viability Constraint Analysis can capture the contrast between English and Farsi? As we have seen in previous subsection, the Viability Constraint Analysis captures the contrast between plain *any* DPs and numeral *any* by assuming a split quantificational configuration for numeral *any*, where the numeral scopes over the modal and the existential component of *any* scopes under the modal. With this assumption, the Viability Constraint Analysis derives a contingent meaning for numeral *any* occurring in sentences containing a modal, any modal. Having said that, a natural way for the Viability Constraint Analysis to capture the pattern in Farsi would be to assume that the numeral and existential components in numeral *har*, for reasons to be determined in future work, do not split, meaning that the numeral and the existential components of numeral *har* has to scope over modals.

Let's provide illustration. As in Section 5.2.2, we will assume that Farsi numerals are given an $\langle e,t \rangle$ type, as in (336), repeated in (371) below, and are interpreted within the *har* DP that contains them.

(371) $\llbracket \text{two} \rrbracket = \lambda x.|x| \geq 2$

We star with positive episodic sentence. Consider the LF in (372) below. The Viability Constraint cannot be satisfied in (372), since the pre-exhaustified domain alternatives in (373) are mutually exclusive and, therefore, cannot all be true in any given world. This

correlates with the deviance of numeral *har* in positive episodic sentences.

(372) [har two books$_D$] λ_1 Roya read t_1

(373)
$R(a \oplus b) \wedge \neg R(a \oplus c) \wedge \neg R(b \oplus c)$
$R(a \oplus c) \wedge \neg R(b \oplus c) \wedge \neg R(a \oplus b)$
$R(b \oplus c) \wedge \neg R(a \oplus c) \wedge \neg R(a \oplus b)$

Because the Viability Constraint is checked at the smallest constituent containing the free choice item, it also fails when numeral *har* scopes under a modal, any modal, as in (374), for the same reason mentioned above for (372).

(374) $\Box_C$ / $\Diamond_C$ [[har two books$_D$] λ_1 Roya read t_1]

When numeral *har* scopes over a possibility modal, as in (375), this setup replicates the results of the Wide Scope Constraint Analysis: the strengthened meaning in (376), where we assume $g(C) = \{w_1, w_2, w_3\}$, is true in a model like (377), where the Viability Constraint can be satisfied (when $g(C') = \{w_1\}$, $g(C'') = \{w_2\}$, and $C''' = \{w_3\}$), given the pre-exhaustified domain alternatives in (378), which aligns with the acceptability of numeral *har* in these contexts.

(375) [har two books$_D$] λ_1 $\Diamond_C$ Roya read t_1

(376) $\Diamond_C R(a \oplus b) \wedge \Diamond_C R(b \oplus c) \wedge \Diamond_C R(a \oplus c)$

(377)

w_1	$R(a \oplus b) \wedge \neg R(b \oplus c) \wedge \neg R(a \oplus c)$
w_2	$R(a \oplus c) \wedge \neg R(a \oplus b) \wedge \neg R(b \oplus c)$
w_3	$R(b \oplus c) \wedge \neg R(a \oplus b) \wedge \neg R(a \oplus c)$

(378)
$\Diamond_{C'} R(a \oplus b) \wedge \neg\Diamond_{C'} R(a \oplus c) \wedge \neg\Diamond_{C'} R(b \oplus c)$
$\Diamond_{C''} R(a \oplus c) \wedge \neg\Diamond_{C''} R(b \oplus c) \wedge \neg\Diamond_{C''} R(a \oplus b)$
$\Diamond_{C'''} R(b \oplus c) \wedge \neg\Diamond_{C'''} R(a \oplus c) \wedge \neg\Diamond_{C'''} R(a \oplus b)$

When numeral *har* scopes over a necessity modal, as in (379), the Viability Constraint fails, since the strengthened meaning in (380) entails that the pre-exhaustified domain

alternatives in (381) are false, no matter which subset of C their variables denote. The violation of the the Viability Constraint explains the deviance of numeral *har* with necessity modals.

(379) [har two books$_D$] λ_1 $\Box_C$ Roya read t_1

(380) $\Box_C R(a \oplus b) \wedge \Box_C R(b \oplus c) \wedge \Box_C R(a \oplus c)$

(381) $\Box_{C'} R(a \oplus b) \wedge \neg\Box_{C'} R(a \oplus c) \wedge \neg\Box_{C'} R(b \oplus c)$
$\Box_{C''} R(a \oplus c) \wedge \neg\Box_{C''} R(b \oplus c) \wedge \neg\Box_{C''} R(a \oplus b)$ (PDAs)
$\Box_{C'''} R(b \oplus c) \wedge \neg\Box_{C'''} R(a \oplus c) \wedge \neg\Box_{C'''} R(a \oplus b)$

Then, assuming that split quantification configuration for numeral *har* is not an option, meaning that the existential and the numeral components of numeral *har* cannot split, can capture the contrast between English and Farsi within the Viability Constraint Analysis.

5.3.3 Interim summary

This section provided an overview of the Viability Constraint Analysis of the contrast between plain *any* DPs and numeral *any*. This analysis, just like the Wide Scope Constraint Analysis, assumes that FCIs are existential quantifiers that introduce and excludes pre-exhaustified domain alternatives. The Viability Constraint Analysis assumes that the alternatives are subject to the Viability Constraint which requires each alternative to hold in some world. The Viability Constraint captures the distribution of *any* DPs: it fails when plain *any* occurs in positive episodic sentences or scopes under modals, any modals; when *any* scopes over modals, the Viability Constraint is satisfied , but only with possibility modals. To explain the contrast between *any* DPs and numeral *any*, the Viability Constraint Analysis assumes that the numeral and the existential components of numeral *any* can split, with the numeral component scoping over and the existential component scoping under modals. To capture the contrast between English and Farsi, we assumed that split quantification configuration for numeral *har* is not an option, meaning that the numeral must be interpreted with the DP headed by *har*.

We have seen that, with minimal modifications, both the Wide Scope Constraint Analysis and the Viability Constraint Analysis can capture the distribution and interpretation of Farsi *har -i* DPs and numeral *har*. The data discussed so far have involved distributive predicates. The next section considers sentences with collective predicates. The two minimally modified analyses, then, differ in the predictions they make: the extended Wide Scope Constraint Analysis captures the attested interpretation, but the extended Viability Constraint Analysis undergenerates.

5.4 Collective predicates

Consider the sentence in (382) below, with the collective predicate *tanab keshidan dor-e* ('to wrap a rope around'):

(382) Bayad dor-e har do ta ketab-i ye tanab bekesh-i.
must aroundEZ HAR two CL book-IND a rope pull-2.SG
'You must wrap a rope around each group of two books.'

As the translation shows, the sentence in (382) makes a universal claim: that for each group of two books x, the addressee is required to wrap a rope around x. The sentence is judged to be false in the scenario in (383-a) but true in the scenario in (383-b). The reported intuition is that the addressee would be disobeying if there are some groups of two books that he doesn't wrap a rope around.

(383) *Scenarios*

a. There are three distinctive books and two copies of each one. The books are put together into groups of two books for a total of three books, where each group contains two distinctive copies. The addressee is required to wrap a rope around at least one group of two book, and it can be any group of two books.

b. There are three distinctive books and two copies of each one. The books

are put together into groups of two books for a total of three books, where each group contains two distinctive copies. The addressee is required to wrap a rope around each and every group of two books.

The two minimally modified analyses, the Wide Scope Constraint Analysis and the Viability Constraint Analysis, will now be assessed with respect to this observation.

Let's start with the modified Wide Scope Constraint Analysis. The modified Wide Scope Constraint Analysis predicts the reported intuition. The sentence in (382) has the LF in (384-a) below:

(384) a. $[\![\mathrm{O}_{\text{EXH-D}}\ \mathrm{O}_{\sigma}$ har two books$_{\mathrm{D}}\lambda_1\ \Box_{\mathrm{C}}$ you wrap a rope around $\mathrm{t}_1]\!] =$
$\underbrace{[\Box_{\mathrm{C}}\mathrm{W}(\mathrm{a}\oplus\mathrm{b})\wedge\Box_{\mathrm{C}}\mathrm{W}(\mathrm{b}\oplus\mathrm{c})\wedge\Box_{\mathrm{C}}\mathrm{W}(\mathrm{a}\oplus\mathrm{c})]}_{\text{assertion + domain implicature}}\ \wedge\underbrace{\neg\Box_{\mathrm{C}}\mathrm{W}(\mathrm{a}\oplus\mathrm{b}\oplus\mathrm{c})\ldots)}_{\text{scalar implicature}}$

b. $\Box_{\mathrm{C}}\mathrm{W}(\mathrm{a}\oplus\mathrm{b}\oplus\mathrm{c})$

The LF in (384-a) satisfies the Wide Scope Constraint. Because the predicate is collective, the proposition that it denotes is not a contradiction: the first conjunct does not entail the scalar alternative in (384-b) and is compatible with the second conjunct. The proposition conveys universal quantification over groups of two books that the addressee is required to wrap a rope around each such group and that the addressee is not required to wrap a rope around any larger group of books. The truth conditions in (384-a) are satisfied in the scenario in (383-a) but not in the the scenario in (383-b), matching the reported intuition. Furthermore, the Scale Economy Constraint is not violated: again, because the predicate is collective, quantifying over groups of books containing more or less books would have yielded a different meaning.

The predictions of the modified Wide Scope Constraint Analysis contrast with those of the modified Viability Constraint Analysis. Consider the two possible LFs of the sentence in (382) above, in (385-a) and (386-a):

(385) a. $\Box_{\mathrm{C}}$ [har two books$_{\mathrm{D}}$] λ_1 you wrap a rope around t_1

b. $\mathrm{W}(\mathrm{a}\oplus\mathrm{b})\wedge\neg\mathrm{W}(\mathrm{b}\oplus\mathrm{c})\wedge\neg\mathrm{W}(\mathrm{a}\oplus\mathrm{c})\ldots$ (Alternatives)

(386) a. [har two books$_D$] λ_1 $\Box_C$ you wrap a rope around t_1

b. $\Box_C W(a \oplus b) \wedge \neg\Box_C W(b \oplus c) \wedge \neg\Box_C W(a \oplus c) \ldots$ (Alternatives)

c. $\Box_C W(a \oplus b) \wedge \Box_C W(b \oplus c) \wedge \Box_C W(a \oplus c) \ldots$

In the LF in (385-a), the Viability Constraint is checked at the IP below the modal. The Viability Constraint requires all pre-exhaustified domain alternatives, in (385-b), to be true at the world of evaluation. Since these alternatives are mutually exclusive, the Viability Constraint fails to be satisfied.

The wide scope construal of numeral *har*, in (386-a), does not fare much better. The assertion, together with negation of the pre-exhaustified domain alternatives derives the conjunction in (386-c). If (386-c) is true, then the addressee wraps a rope around each group of two books in all permitted worlds, and, so no pre-exhaustified domain alternative will be true with respect to any subdomain of permitted worlds.

The Viability Constraint fails whether numeral *har* is given wide or narrow scope with respect to the modal. The sentence in (382) is then ruled out. In contrast with the Wide Scope Constraint, the Viability Constraint Analysis undergenerates.

5.5 Conclusion

We have seen that the contrast in distribution between *any* and numeral *any* that the Wide Scope Constraint and the Viability Constraint analyses aim to capture is not universal: in Farsi, the distribution of the counterparts of *any* and numeral *any* mirror each other.

Because the contrast between *any* and numeral *any* is not universal, the issue of how the Wide Scope Constraint and the Viability Constraint analyses might be extended to capture the observed cross-linguistic variation arises.

In this chapter, we have entertained two natural ways in which these analyses could be extended to capture the Farsi data: the Wide Scope Constraint Analysis can assume that the Wide Scope Constraint cannot be violated in Farsi, and the Viability Constraint Analysis can assume that the numeral is interpreted within the DP.

While both extended analyses would capture the basic data, the extended Viability

Constraint Analysis is too restricted, as it fails to predict the acceptability of sentences with numeral *har* containing collective predicates.

Some questions are left open for further research. One concerns the parallelism between numeral *any* and numeral *har*. Numeral *any* and numeral *har* differ in one respect that we have not discussed: while numeral *any* has been described not to be sensitive to subtrigging (Dayal, 2005), numeral *har* like English *any* is, as the counterparts of the sentences in (329) and (331) with clausal modifiers—in (387) and (388) below— show.

(387) Roya har do ta ketab-i ke roo miz boode bashe xund-e.
Roya HAR two CL book-IND that on table was SUBJ read-3.SG
'Roya read any two books that were on the desk.'

(388) Roya bayad har do ta ketab-i ke peyda mikon-e bexun-e.
Roya must HAR two CL book-IND that find does-3.SG read-3.SG
'Roya must read any two books that she finds.'

More importantly, a really pressing question for the Wide Scope Constraint Analysis remains: What determines whether or not the Wide Scope Constraint can be violated in a given language? Where does the difference between Farsi and English ultimately derive from? We hope to address this question in future work.

Chapter 6

Universal force from exhaustification: Farsi *hame -i* DPs

6.1 Introduction

In previous chapters we have seen quantificational DPs, or in a more general term, polarity items, that have different interpretations in different environment in which they occur. For instance, as we have seen, in DE contexts, FCIs have existential force, when they are grammatical, but in UE contexts they convey meanings stronger than those of regular existentials. In an influential line of work, these items are analyzed as existential quantifiers that introduce into the semantic derivation alternative meanings (Krifka, 1991, 1995; Kratzer and Shimoyama, 2002; Chierchia, 2013), as defended throughout this dissertation. An important contribution of this type of analysis is the realization that the diverse behavior of polarity items can be reduced to a small number of parameters of variation that have to do with the types of alternatives that these items introduce, as seen most clearly in Chierchia 2013. For instance, as discussed in great details in previous chapter, FCIs have been analyzed as items introducing into the semantic derivation two types of alternatives: (i) pre-exhaustified domain alternatives and (ii) scalar alternatives (Chierchia, 2013); some free choice items, like German *irgendein* or Italian *un qualunque*, have been claimed to introduce alternatives corresponding to all subsets of the extension of the NP they combine with ('full domain alternatives'), while others, like Spanish *algún* or Romanian *vreun*, have been claimed to introduce only those alternatives

that correspond to the singleton subsets ('singleton domain alternatives') (Alonso-Ovalle and Menéndez-Benito, 2010; Fălăuş, 2014; Alonso-Ovalle and Menéndez-Benito, 2015a); or, to provide another example, the so-called '*even*-type' negative polarity items have been analyzed as introducing alternatives ordered by likelihood, while the '*only*-type' negative polarity items have been taken to introduce alternatives ordered by entailment (Krifka, 1991; Chierchia, 2013).

Other dimensions of variation have been found. Bar-Lev and Margulis (2014) show that the Hebrew determiner *kol* oscillates between existential and universal force: in unembedded contexts, *kol* contributes universal quantification, as seen in (389), while in downward entailing contexts, it can be seen as contributing existential force, like in (390).

(389) (etmol) kol yeled ciyer et acmo b-a-maxberet Selo.
(yesterday) KOL boy drew ACC self in-the-notebook his
'(Yesterday,) every boy drew himself in his notebook.'
(Bar-Lev and Margulis, 2014, p. 60)

(390) lo nigram kol nezek.
NEG was.caused KOL damage
'No damage was caused.' $\neg > \exists$ (Bar-Lev and Margulis, 2014, p. 61)

The variation in quantificational force that *kol* illustrates can be related to the types of alternatives that polarity items invoke. Chierchia (2013) proposes that FCIs introduce into the semantic derivation two types of alternatives: (i) pre-exhaustified domain alternatives and (ii) scalar alternatives. Bar-Lev and Margulis (2014) show that the variation in quantificational force of Hebrew *kol* can be derived from the assumption that this polarity item is existential at core, but that, unlike FCIs, it introduces domain but not scalar alternatives. In this chapter, we show that the pattern extends beyond Hebrew.

We will focus on a variety of Farsi DPs ('*hame -i* DPs') that quantify over types. The main goal of the chapter is to argue that, despite appearances, the quantificational force of *hame -i* DPs oscillates between existential and universal force, much like that of Hebrew *kol*: they express universal force in positive episodic sentences and can express

existential force in DE contexts. Once we establish that point, we can resort to the type of analysis proposed by Bar-Lev and Margulis (2014) to capture the attested variation in quantificational force.

The rest of the chapter is organized as follows. Section 6.2 presents the basic profile of *hame -i* DPs. The section shows that *hame -i* DPs contribute universal quantification in positive episodic environments and that this universal interpretation can, but does not have to, survive embedding under a downward entailing operator. In downward entailing contexts, a second interpretation emerges. This interpretation could be derived via a *hame -i* DP with universal force scoping over the downward entailing operator, or via a *hame -i* DP with existential force scoping under it. Section 6.3 argues for the second possibility. In section 6.4, we show that, unsurprisingly, the variation in quantificational force can be captured by importing Bar-Lev and Margulis's analysis of Hebrew *kol*. Finally, section 6.5 defends this analysis over two possible alternatives: analyzing *hame -i* DPs as universal free choice items or definites. Section 6.6 concludes.

6.2 Farsi *hame -i* DPs

We will start by surveying the interpretation of *hame -i* DPs. Section 6.2.1 shows that the interpretation of *hame -i* DPs varies, depending on whether they occur in positive episodic sentences or in downward entailing sentences. Section 6.2.2 concludes with a question: whether the difference in interpretation is due to a difference in scope or a difference in the quantificational force that *hame -i* DPs convey. Section 6.3 will argue for the second possibility.

6.2.1 A contrast

We will now probe into the interpretation of *hame -i* DPs. In this section, we will see that the universal force of *hame -i* DPs can be weakened to existential in downward entailing environments.

6.2.1.1 *Hame -i* DPs in positive episodic sentences

In positive episodic sentences, *hame -i* DPs can convey universal force.[35] For instance, the sentence in (391) claims that for each (contextually relevant) type of (contextually relevant) hole P, Forood fell in a hole of type P. Accordingly, that sentence is true in the scenario in (392), represented in figure 6.1 and false in the scenario in (393), represented in figure 6.2.

(391) Forood too hame chale-i oftad.
Forood in hame hole-IND fell.3SG
'Forood fell in all types of holes.'

(392) *Scenario:* At the adventure race, there were three types of holes (red, green, blue), and two holes of each type (red_1, red_2, $green_1$, $green_2$, $blue_1$, $blue_2$). Forood fell in red_1, red_2, $green_1$, $green_2$, $blue_1$ and $blue_2$.

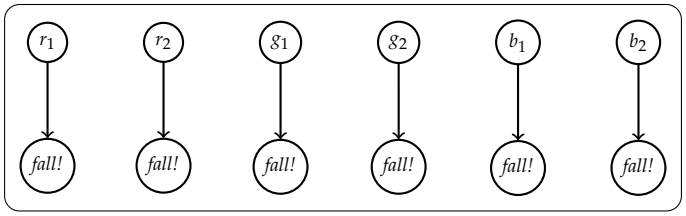

Figure 6.1: (391) *Forood fell in* hame *hole*-i. = ✓
'r_n' are red holes, 'g_n' are green holes, 'b_n' blue holes.

[35] We say *can*, because *hame -i* DPs can convey a 'random choice' interpretation , with volitional verbs (Alonso-Ovalle and Menéndez-Benito, 2018). The sentence in (i), for instance, can convey that Forood bought *a* book of some type and chose the type randomly. We leave aside cases like this for the moment being.

(i) Forood hame book-i xarid.
Forood hame book-IND bought.3SG

(393) *Scenario:* At the adventure race, there were three types of holes (red, green, blue), and two holes of each type (red_1, red_2, $green_1$, $green_2$, $blue_1$, $blue_2$).
Forood fell in red_1, red_2, $green_1$, $green_2$ and in no other hole.

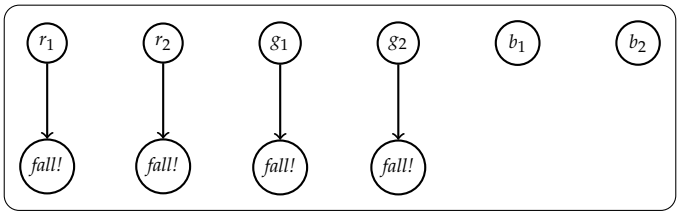

Figure 6.2: (391) *Forood fell in* hame *hole*-i. = ✗
'r_n' are red holes, 'g_n' are green holes, 'b_n' blue holes. Nodes without an arrow represent successful jumps.

Hame -i DPs quantify over types, not tokens. We can see that by noting that the sentence in (391), repeated below, can be felicitously continued with (the Farsi counterpart) of (395-a), but not with (the Farsi counterpart of) (395-b).

(394) Forood too hame chale-i oftad.
Forood in hame hole-IND fell.3SG
'Forood fell in all types of holes.'

(395) a. ...But, he didn't fall in every hole.
b. #...But, he didn't fall in every type of hole.

Accordingly, (391) is true in the scenario in (396), represented in figure 6.3, where Forood did not fall in every hole, but did fall in every contextually determined type of hole.

(396) *Scenario:* There are three types of holes (red, green, blue), and two holes of each type (red_1, red_2, $green_1$, $green_2$, $blue_1$, $blue_2$).
Forood fell in red_1, $green_1$, $blue_1$ and in no other hole.

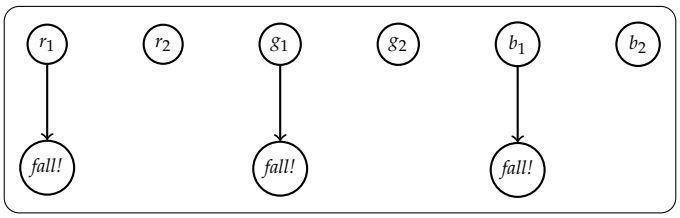

Figure 6.3: (391) *Forood fell in* hame *hole*-i. = ✓
'r_n' are red holes, 'g_n' are green holes, 'b_n' blue holes.'

The interpretation of *hame -i* DPs in positive episodic sentences, like the one above, contrasts with their interpretation in downward entailing environments, as we will see next.

6.2.1.2 Downward entailing contexts

In downward entailing contexts, we detect two possible interpretations: a weak and a strong one. We will illustrate this with *hame -i* DPs in the antecedent of conditionals.

First, we note that the universal force of *hame -i* DPs *can* (but does not have to) survive embedding in downward entailing contexts. The sentence in (397), for instance, can convey that the speaker will win the bet if Forood falls in every type of hole. Accordingly, (397) can be continued with (the Farsi counterpart of) (398).

(397) Age Forood too hame chale-i bioft-e, shart ro mibar-am.
if Forood in hame hole-IND fall-3SG, bet ACC win-1SG
'If Forood falls in *hame* hole-*i*, I win the bet.'

(398) ...but if he falls in some types of holes but not in all of them, I lose the bet.

At the same time, the sentence in (397) can have a stronger interpretation, under which it conveys that the speaker wins the bet as soon as Forood falls in some type of hole or other. Under that interpretation, the continuation in (399) is contradictory.

(399) #...but if he falls in some types of holes but not in all of them, I lose the bet.

6.2.2 Wide-scope universal or narrow-scope existential?

Given the interpretation of *hame -i* DPs in positive episodic environments, the weaker interpretation of the sentence in (397) is unsurprising, as it is captured by assuming that the *hame -i* DP contributes universal force and that the item is interpreted within the antecedent of the conditional: under this interpretation, (397) conveys that the speaker wins the bet if for every contextually relevant type of hole P, Forood falls in a hole of type P.

We will represent this interpretation as in (400) where we assume that $\mathbb{C}$ retrieves a contextually relevant set of properties that partitions (a contextually relevant) set of holes.[36]

(400) $[\forall P_{et} \in \mathbb{C}([\![\text{hole}_C]\!])\exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(F,x)]] \Rightarrow \textsc{win}(Sp,B)$

The stronger interpretation of (397) is more interesting. In principle, it could be due to the universal component of *hame -i* DPs scoping over the whole conditional, as in (401-a), or an existential *hame -i* DP taking narrow scope within the antecedent of the conditional, as in (401-b).

(401) a. $\forall P_{et} \in \mathbb{C}([\![\text{hole}_C]\!])[\exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(F,x)] \Rightarrow \textsc{win}(Sp,B)]$

b. $[\exists P_{et} \in \mathbb{C}([\![\text{hole}_C]\!])\exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(F,x)]] \Rightarrow \textsc{win}(Sp,B)$

We could discard the first possibility based on the observation that the antecedent of conditionals should block extraction of the DP. However, we can't discard the possibility that *hame -i* DPs be existential at core, with the universal force attested in positive episodic sentences being derived via exhaustification. If that were the case, then, perhaps *hame -i* DPs could get exceptional wide scope by whatever mechanism assigns exceptional scope to other existentials, with further exhaustification deriving the wide scope universal force. It is worth investigating then if the strong interpretation attested in downward entailing environment corresponds to a narrow scope existential interpretation or not.

[36] It looks like the types that *hame -i* DPs range over are not necessarily stable, hence our choice to resort to quantification over properties rather than subkinds. We nevertheless leave open for now the possibility that *hame -i* DPs range over *ad hoc* subkinds.

This is the goal of the next section.

6.3 *Hame -i* DPs contribute existential force in DE environments

Investigating the interpretation of *hame -i* DPs in conditionals will not be useful to tease apart the two possibilities just discussed. The reason why is quite straightforward: to the extent that conditionals are 'anti-additive' functions (Zwarts, 1998), functions for which the equality in (402) holds, the two interpretations in (401-a) and (401-b) are logically equivalent, as discussed in the introduction.

(402) Anti-additivity:
$f(A \vee B) = f(A) \wedge f(B)$

To determine whether *hame -i* DPs contribute narrow scope existential quantification or wide scope universal quantification over types, we need to probe into the interpretation of *hame -i* DPs in other downward entailing contexts that are not anti-additive. That's what we will do next.

We will start by considering the interpretation of the sentence in (403), with the adverb of quantification *rarely*, which, with Ladusaw (1979), we take to convey 'usually not.'

(403) Forood be-nodrat too hame chale-i oftad, har zaman-i az roo chale
Forood rarely in hame hole-IND fell.3SG, har time-IND from on hole
parid.
jumped.3SG
'Forood rarely fell in *hame* hole *-i*, whenever he jumped over a hole.'

Rarely is not anti-additive. To see that, consider the sentences in (404) below. We will take (404-b), for instance, to mean that on less than half of the occasions where Forood had dinner at the cafeteria last month, he had tofu, as in (405).

(404) a. Whenever he had dinner at the cafeteria last month, Forood rarely had tofu or rice.

b. Whenever he had dinner at the cafeteria last month, Forood rarely had tofu.

c. Whenever he had dinner at the cafeteria last month, Foroord rarely had rice.

(405) $$\frac{|\{e:\ \textsc{dine}(F,T,e) \wedge \textsc{at-cafeteria}(e) \wedge \textsc{last-month}(e)\}|}{|\{e:\ \exists x[\textsc{dine}(F,x,e) \wedge \textsc{at-cafeteria}(e) \wedge \textsc{last-month}(e)\}|} < \frac{1}{2}$$

Now consider the scenario represented in figure 6.4, which assumes that Forood had dinner at the cafeteria last month on ten occasions ($d_1,\ldots,d_{10}$.) Under the truth-conditions that we are assuming, the sentence in (404-b) is true in this scenario, since Forood only had tofu twice out of ten times. Likewise, (404-c) comes out true, since Forood only had rice three out of ten times. That means that the conjunction of (404-b) and (404-c) will be true. If *rarely* were anti-additive, (404-a) would have to be true in the world represented in figure 6.4, but (404-a) is false, since Forood had rice or tofu five out of ten times, not less than five times.

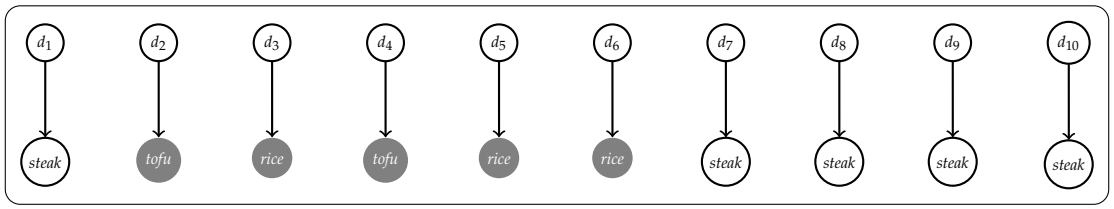

Figure 6.4: *Whenever he had dinner at the cafeteria last month, Forood **rarely** ate tofu or rice.*

Let us now get back to the interpretation of *hame -i* DPs in sentences like that in (403), where a *hame -i* DP is under the scope of *rarely.* We note that (403) is false in the scenario in (406) below, represented in figure 6.5.

(406) *Scenario:* Forood participated in an adventure race. In the race, there were forty holes: five types of holes and eight holes of each type. Forood jumped over the first ten holes. Those were of five different types. These were the only jumps he took. He fell in every hole. (403) = ✗

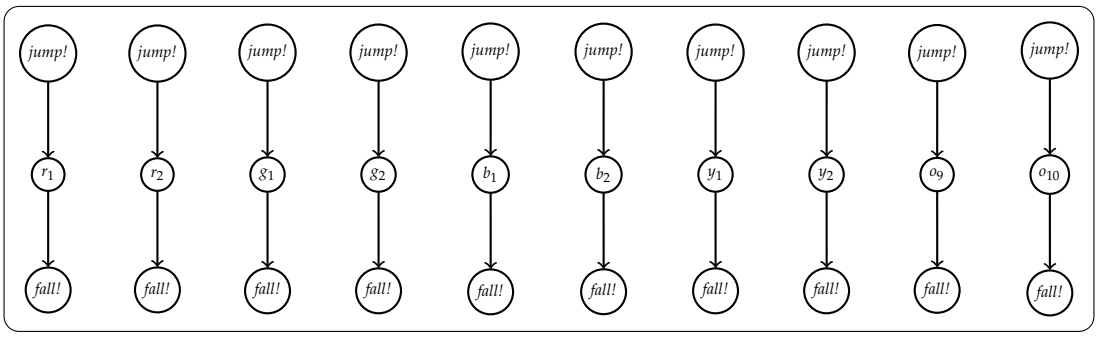

Figure 6.5: (403) *Whenever he jumped, Forood* ***rarely*** *fell into* hame *hole*-i = ✗
'r_n' are red holes, 'g_n' green, 'b_n' blue, 'y_n' yellow, 'o_n' orange.

The truth-conditions associated with the *hame -i* DP taking narrow or wide scope with respect to *rarely* are not equivalent. The truth-conditions associated with an existential *hame -i* DP taking narrow scope are represented in (407): they convey that less than half of the jumping events were falling events.

(407)
$$\frac{\left|\left\{ e: \begin{array}{c} \exists x[\textsc{jump}(F,x,e) \wedge \exists P_{et} \in \mathbb{C}([\![\text{hole}_C]\!]) \\ \exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(F,x,e)]] \end{array} \right\}\right|}{|\{e: \exists x[\textsc{jump}(F,x,e)]\}|} < \frac{1}{2}$$

These truth-conditions are not met in the scenario represented in figure 6.5. In that scenario, there were ten events of Forood falling over some type of hole or other and ten events of Forood jumping. The proportion of events of the first type that are events of the second type is 100%, hence the truth-conditions are not met.

(408)
$$\frac{\left|\left\{ e: \begin{array}{c} \exists x[\textsc{jump}(F,x,e)] \wedge \exists P_{et} \in \mathbb{C}([\![\text{hole}_C]\!]) \\ \exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(F,x,e)]] \end{array} \right\}\right|}{|\{e: \exists x[\textsc{jump}(F,x,e)]\}|} = 1$$

The truth-conditions associated with a universal *hame -i* DP taking scope over *rarely*, represented below, convey that for every type of hole P, less than half of the jumping events are fallings into a P-hole.

(409) $$\forall P_{et} \in \mathbb{C}([\![\text{hole}_C]\!])$$
$$\left[\frac{|\{e : \exists x[\textsc{j}(F,x,e)] \wedge \exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{f}(F,x,e)]]\}|}{|\{e : \exists x[\textsc{jump}(F,x,e)]\}|} < \frac{1}{2}\right]$$

These truth-conditions are met in the scenario represented in figure 6.5, since, as seen below, for every type of hole P, two out of the ten times when Forood fell, he fell into a P-hole.

(410) $$\forall P_{et} \in \mathbb{C}([\![\text{hole}_C]\!])$$
$$\left[\frac{|\{e : \exists x[\textsc{j}(F,x,e)] \wedge \exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{f}(F,x,e)]]\}|}{|\{e : \exists x[\textsc{jump}(F,x,e)]\}|} = \frac{1}{5}\right]$$

As reported above, the sentence in (403) is judged to be false in the scenario represented in figure 6.5 above. This means that there must be a way of interpreting the *hame -i* DPs as conveying existential force within the scope of *rarely*.

Other non anti-additive operators lead to the same results. Consider, for instance, the determiner *few*. We will take the sentence in (411-b) to convey that less than half of the students who ate something ate tofu, as in (412). To see that *few* is not anti-additive, consider the scenario represented in figure 6.6, with ten students ($s_1, \ldots, s_{10}$). In this scenario, the sentences in (411-b) and (411-c) are both true (since only two students ate tofu and three rice), but the sentence in (411-a) is not, since exactly half of the students ate tofu or rice.

(411) a. Few students ate tofu or rice.

b. Few students ate tofu.

c. Few students ate rice.

(412) $$\frac{|\{x : \textsc{student}(x) \wedge \textsc{ate}(x,T)\}|}{|\{x : \textsc{student}(x) \wedge \exists y[\textsc{ate}(y,x)]\}|} < \frac{1}{2}$$

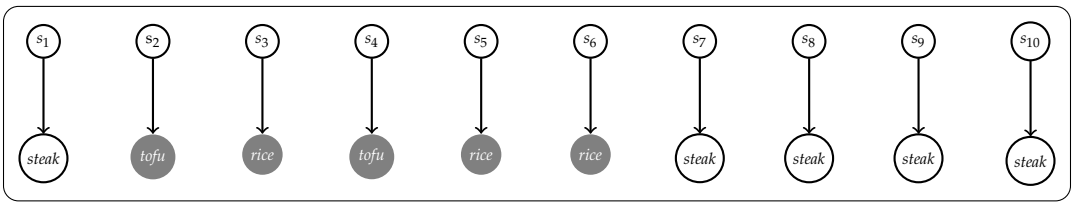

Figure 6.6: *Few students ate tofu or rice.*

Let us now examine the interpretation of *hame -i* DPs in the context of non anti-additive *few*. Consider, for instance, the sentence in (413).

(413) Tedad-e kam-i danshjoo too hame chale-i oftad-and.
number-EZ little-IND student in hame hole-IND fell-3PL
'Few students fell in *hame* hole *-i.*'

The sentence in (413) is judged to be false in the scenario below, represented in figure 6.7.

(414) *Scenario:* There were ten holes of ten different types. Twenty students jumped over the ten holes. Every student fell in a hole. Two students fell in each type of hole. (413) = ✗

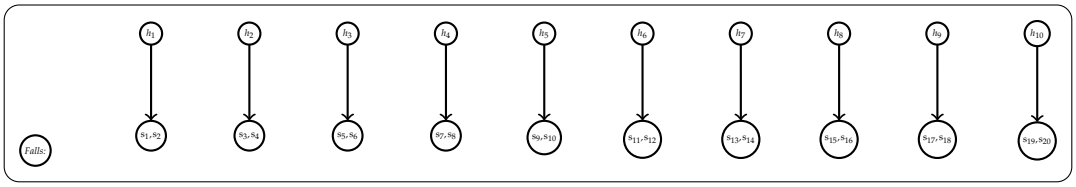

Figure 6.7: (413) *Few students fell into* hame *hole*-i. = ✗

The truth-conditions predicted if the *hame -i* DP had existential force and took scope under *few* are represented in (415): they convey that less than half of the students fell into a hole.

(415) $$\frac{|\{y:\ \textsc{st}(y)\ \&\ \exists e \exists P_{et} \in \mathbb{C}([\![\text{hole}_C]\!]) \exists x_e [[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{f}(y,x,e)]\}|}{|\{y : \textsc{student}(y)\}|} < \frac{1}{2}$$

These truth-conditions do not obtain in the scenario represented in figure 6.7, since, in that scenario, all twenty students fell into a hole.

(416) $$\frac{|\{y:\ \textsc{st}(y)\ \&\ \exists e \exists P_{et} \in \mathbb{C}([\![\text{hole}_C]\!]) \exists x_e [[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{f}(y,x,e)]\}|}{|\{y : \textsc{student}(y)\}|} = 1$$

In contrast, the truth-conditions derived by assuming that the *hame -i* DP has universal force and scopes over *few* are represented in (417): they convey that, for every type of hole P, less than half of the students fell into a hole of type P.

(417) $$\forall P_{et} \in \mathbb{C}([\![\text{hole}_C]\!]) \left(\frac{|\{y:\ \textsc{student}(y)\ \&\ \exists e \exists x_e [[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(y,x,e)]\}|}{|\{y : \textsc{student}(y)\}|} < \frac{1}{2} \right)$$

These truth-conditions are satisfied in the scenario represented in figure 6.7, since, for every type of hole P, two out of twenty students fell into a P-hole.

(418) $$\forall P_{et} \in \mathbb{C}([\![\text{hole}_C]\!]) \left(\frac{|\{y:\ \textsc{student}(y)\ \&\ \exists e \exists x_e [[\![\text{hole}_C]\!](x) \wedge P(x) \wedge \textsc{fall}(y,x,e)]\}|}{|\{y : \textsc{student}(y)\}|} = \frac{1}{10} \right)$$

Once again, the narrow scope existential analysis derives truth-conditions that match the predicted truth-value, but the wide scope universal analysis doesn't. We conclude then that a narrow scope existential parse of *hame -i* DPs must exist.

6.4 Applying Bar-Lev and Margulis 2014 to *hame -i* DPs

Let us summarize. We have seen that *hame -i* DPs quantify over types. In downward entailing contexts they can contribute existential force. This contrasts with their behavior in positive episodic sentences, where they convey universal quantification. This means that *hame -i* DPs, like the Hebrew determiner *kol*, oscillate between existential and universal force, depending on the monotonicity properties of the environment that they are in.

To account for the oscillation between existential and universal force, we can simply import the analysis of *kol* presented in Bar-Lev and Margulis (2014), which naturally

extends to *hame -i* DPs.

Farsi NPs marked with enclitic *-i* have been argued to introduce domain alternatives (Alonso-Ovalle and Moghiseh, 2019a,b; Deal and Farudi, 2007). In line with this, we will treat *hame -i* DPs as existential quantifiers that quantify over types at the ordinary semantics level, as in (419). As before, we assume that $\mathbb{C}$ retrieves a contextually relevant set of properties that partitions (a contextually relevant) set of holes.

(419) $[\![\text{ hame hole-i }]\!]^{o} = \lambda Q.\exists P_{et} \in \mathbb{C}([\![\text{hole}_C]\!])\exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge Q(x)]$

We follow Bar-Lev and Margulis's assumptions for Hebrew *kol* and take *hame -i* DPs to introduce into the semantic derivation domain but not scalar alternatives. Domain alternatives are determined by considering subsets of the contextually relevant set of properties partitioning the relevant domain of entities in the extension of the NP, as in (420).

(420) $[\![\text{ hame hole-i }]\!]^{ALT} =$

$\{\lambda Q.\exists P_{et} \in D\ \exists x_e[[\![\text{hole}_C]\!](x) \wedge P(x) \wedge Q(x)] : D \subset \mathbb{C}([\![\text{hole}_C]\!])\}$

As is standard, we assume that these alternatives grow propositional and can be accessed by an exhaustification operator at propositional sites. To illustrate, we consider our target example in (421-a) below, together with its LF, in (421-b).

(421) a. Forood too hame chale-i oftad.
Forood in hame hole-IND fell.3SG
'Forood fell in all types of holes.'

b. LF: EXH [$_{IP}$ hame hole-i λ_1 Forood fell in t_1]

We will assume, for illustration, that the extension of the NP consists of four holes, of two different colours, red and green, and that $\mathbb{C}$ retrieves the property of being red and the property of being green.

(422) a. $[\![\text{hole}_C]\!] = \{R_1, R_2, G_1, G_2\}$

b. $\mathbb{C}([\![\text{hole}_C]\!]) = \{\text{RED}, \text{GREEN}\}$

The sister of EXH in the LF in (421-b) denotes the disjunction in (423-a) at the ordinary semantic level. At the alternative level, it denotes a set of propositions, containing each of the disjuncts.[37]

(423) a. $[\![[_{IP}$ hame hole-i λ_1 Forood fell in $t_1]]\!]^O$ =
$\exists x_e[\text{RED}(x) \wedge \text{FALL}(F,x)] \vee \exists x_e[\text{GREEN}(x) \wedge \text{FALL}(F,x)]$

b. $[\![[_{IP}$ hame hole-i λ_1 Forood fell in $t_1]]\!]^{ALT}$ =

$$\left\{ \begin{array}{c} \exists x_e[\text{RED}(x) \wedge \text{FALL}(F,x)], \\ \exists x_e[\text{GREEN}(x) \wedge \text{FALL}(F,x)] \end{array} \right\}$$

As Bar-Lev and Margulis 2014 proposed for Hebrew *kol*, grammatical strengthening via a covert exhaustivity operator, EXH, captures the quantificational force of *hame -i* DPs.

We follow Bar-Lev and Fox (2017) in defining EXH, which considers two types of alternatives: the 'innocently excludable' alternatives and the 'innocently includable' alternatives, described below.

(424) *Innocently excludable alternatives*

a. Consider all maximal sets of alternatives that can be excluded while being compatible with the prejacent.

b. The alternatives that are in all such sets are innocently excludable.

(425) *Innocently includable alternatives*

a. Consider all maximal sets of alternatives that can be asserted together with the prejacent and the negation of all innocently excludable alternatives.

b. The alternatives that are in all such sets are innocently includable.

EXH excludes all innocently excludable alternatives and asserts all innocently includable alternatives. This will deliver the universal quantification of *hame -i* DPs in positive episodic sentences. The set containing all maximal subsets of alternatives whose negation is consistent with the proposition in (423-a) is the set that has as members the

[37] From now on, for the purposes of illustration, we will represent each domain alternative as 'GREEN' and 'RED'.

singleton containing the proposition that Forood fell into a green hole and the singleton containing the proposition that Forood fell into a red hole. There is no alternative that is in all those sets, and, therefore, there is no innocently excludable alternative. That means that all alternatives are innocently includable.

(426) a. Maximal sets of alternatives whose negation is consistent with (423-a)
$\{\{\textsc{green}\},\{\textsc{red}\}\}$

b. Innocently Excludable alternatives = $\{\textsc{green}\} \cap \{\textsc{red}\} = \varnothing$

Exhaustification derives the attested universal quantification: the ordinary semantic value of the argument of EXH conveys that Forood fell into at least one green hole or into at least one red hole. EXH strengthens this meaning by asserting, on top of that, that he fell into at least one green hole *and* into at least one red hole, deriving the attested universal meaning.

(427) $[\![\textsc{exh}\ [_{\text{IP}}\ldots]]\!]^{\text{O}} = (\textsc{green} \vee \textsc{red}) \wedge \textsc{green} \wedge \textsc{red} \Leftrightarrow \textsc{green} \wedge \textsc{red}$

Let us now turn to what happens in downward entailing contexts. Recall that in these contexts, *hame -i* DPs can convey either a weak interpretation (where the universal force of the DP surveys the embedding) or a strong interpretation (where the DP contributes existential force.) Take, for instance, the conditional that we previously discussed, repeated below:

(428) Age Forood too hame chale-i bioft-e, shart ro mibar-am.
if Forood in hame hole-IND fall-3SG, bet ACC win-1SG
'If Forood falls in *hame* hole-*i*, I win the bet.'

Local exhaustification derives its weak interpretation, as illustrated below. This interpretation will be consistent with the continuation in (430), as attested.

(429) a. if [EXH [$_{\text{IP}}$ hame hole-i λ_1 Forood fall in t_1]] [I win the bet]

b. $[\![[_{\text{IP}}\ldots]]\!]^{\text{O}} =$ $\textsc{green} \vee \textsc{red}$

c. $[\![\textsc{exh}\ [_{\text{IP}}\ldots]]\!]^{\text{O}} =$ $(\textsc{green} \vee \textsc{red}) \wedge \textsc{green} \wedge \textsc{red} \Leftrightarrow \textsc{green} \wedge \textsc{red}$

d. $[\![((429\text{-a}))]\!]^{O}$ = $(\textsc{green} \wedge \textsc{red}) \rightarrow \textsc{bet}$

(430) . . . but if he falls in some types of holes but not all of them, I lose.

Global exhaustification, as in (431-a) derives the stronger interpretation. When EXH operates globally, the alternatives are entailed by its prejacent. None of them can then be negated while preserving consistency with the prejacent, and none of them are therefore innocently excludable. Because the innocently includable alternatives are entailed by the prejacent, asserting them does not lead to strengthening. Inconsistency with the continuation in (432), as attested, is derived.

(431) a. EXH [$_{IP}$ if hame hole-i λ_1 Forood fall in t_1, I win the bet]

b. $[\![[_{IP} \ldots]]\!]^{O}$ = $(\textsc{green} \vee \textsc{red}) \rightarrow \textsc{bet}$

c. $[\![[_{IP} \ldots]]\!]^{ALT}$ = $\{\textsc{green} \rightarrow \textsc{bet}, \textsc{red} \rightarrow \textsc{bet}\}$

d. $[\![\textsc{exh}\ [_{IP} \ldots]]\!]^{O}$ =

$[(\textsc{green} \vee \textsc{red}) \rightarrow \textsc{bet}] \wedge \textsc{green} \rightarrow \textsc{bet} \wedge \textsc{red} \rightarrow \textsc{bet}$

$\Leftrightarrow (\textsc{green} \vee \textsc{red}) \rightarrow \textsc{bet}$

(432) . . . # but if he falls in some types of holes but not all of them, I lose.

To sum-up: assuming that *hame -i* DPs are existential quantifiers that introduce domain, but not scalar alternatives naturally captures the oscillation in quantificational force that we have attested.

6.5 Discarding possible alternative analyses

To conclude, we will discuss and reject two alternatives analyses to capture the shift in quantificational force of *hame -i* DPs. Universal free choice items can have universal force in episodic sentences when they are licensed by modification. In downward entailing contexts, some of them have existential force. We will start by considering the possibility of analyzing *hame -i* DPs as universal free choice items. We will then entertain the possibility that they be definite DPs.

6.5.1 *Hame -i* DPs are not universal free choice items

Some universal free choice items, like English *any* or Farsi *har -i* DPs, are licensed by (postnominal) modification in non-downward entailing contexts (Legrand, 1975). In those cases, they contribute universal quantification: the sentence in (433), with English *any*, for instance, conveys that John saw all students that happened to be around, and the sentence in (434), with a Farsi *har -i* DP, conveys that Forood fell in all holes that were on his way.

(433) Yesterday, John saw any student that happened to be around.

(Chierchia, 2013, 317)

(434) Forood too har chale-i too masir-esh boode bashe oftad-e.
Forood in har hole-IND in way-3SG.POSS was be.SUBJ fell-3SG
'Forood fell in any hole that was on his way.'

In downward entailing environments, both *any* and *har -i* DPs contribute existential quantification, as the sentences below illustrate:

(435) Yesterday, John did not see any student.

(436) Age Forood too har chale-i bioft-e, shart ro mibar-am.
If Forood in har hole-IND fall-3SG, bet ACC win-1SG
'If Forood falls in any hole, I win the bet.'

This behavior is then parallel to the behavior of *hame -i* DPs illustrated above. We should then ask ourselves whether *hame -i* DPs could be universal free choice items, with the attested universal force in the unembedded case being a case of subtrigging, which can possibly be covert (Legrand, 1975).

We answer the question in the negative. Here's why. The cases where universal free choice items are licensed by modification, convey, on top of the universal meaning illustrated above, a counterfactual inference (Dayal, 1998). *Hame -i* DPs, in contrast, convey universal quantification with no counterfactual component.

To illustrate, consider the sentence in (434), again. The sentence conveys that Forood

fell in holes that were on his way. If there were ten holes in his way, Forood must have fallen in each of them for the sentence to be true. On top of that, the sentence conveys that if there had been other holes, Forood would have fallen into them too. Because of this meaning component, the sentence cannot appropriately describe the scenario in (437) below.

(437) *Scenario:* There were twelve holes on Forood's way $h_1, h_2 \ldots h_{12}$. Forood fell into all of them. These holes were really big. Forood wouldn't have fallen into other smaller holes. (434) = ✗

Now consider the sentence in (438), with a *hame -i* DP.

(438) Forood too hame chale-i oftad.
Forood in hame hole-IND fell.3SG
'Forood fell in all types of holes.'

If the universal interpretation of the *hame -i* DP in (438) were due to some sort of covert subtrigging, (438) would have been false in the scenario in (439) where the expected counterfactual inferences are false. The sentence is however true (and appropriate) in this scenario.

(439) *Scenario:* There were three types of holes (red, green, and blue). In this type of adventure race, these are huge. Yellow and magenta holes are very small. Forood fell in a red, green, and blue hole. He wouldn't have fallen into any other type of hole. (438) = ✓

Another indication that suggests that these are not cases of a subtrigged universal free choice item is the following: with *hame -i* DPs, postnominal modifiers require indicative mood, unlike postnominal modifiers with *har -i* DPs, which require subjunctive, as we saw in (434), repeated in (441) below. The requirement that clausal modifiers in the subtrigged examples is not found only in Farsi, we see the same requirement in Romance, for instance.

(440) Forood too hame chale-i too masir-esh bood oftad.
Forood in hame hole-IND in way-3SG.POSS was.INDIC fell.3SG
'Forood fell in all types of holes that was on his way.'

(441) Forood too har chale-i too masir-esh boode bashe oftad-e.
Forood in har hole-IND in way-3SG.POSS was be.SUBJ fell-3SG
'Forood fell in any hole that was on his way.'

We conclude, then, that *hame -i* DPs are not universal free choice items.

6.5.2 Hame -i DPs as plural definites?

Predicating a plural definite of a distributive predicate usually amounts to universal quantification: the sentence in (442-a) conveys what (442-b) conveys.

(442) a. Forood read the books.
b. Forood read all the books.

At the same time, we know that, sometimes, plural definites can apparently have non-universal readings. For example: (443-a) can describe a situation where Forood touched some, but not all of the statues, where (443-b) would be true.

(443) a. Forood touched the statues.
b. Forood touched some of the statues.

Can *hame -i* DPs be plural definites? We believe the answer is also negative. First, definites trigger accommodation in out of the blue contexts. The sentence in (443-a) is infelicitous out of the blue, and probably, needs to be followed by 'Which statues?'. The sentence in (444), in contrast, is felicitous in an out of the blue context.

(444) Forood be hame mojassame-i dast zad.
Forood to hame statue-IND hand hit.3SG
'Forood touched all types of statues.'

Second, unlike definites, *hame -i* DPs do not seem to pick up discourse referents. When

it follows (445), the sentence in (443-a), with a definite, naturally picks up the bronze statues in the gallery, conveying what (446-a) conveys. In contrast, the sentence in (444) does not range over the bronze statues only . Instead, the sentence in (444) conveys what (446-b) conveys.

(445) There were some bronze statues in the gallery. . . .

(446) a. Forood touched the bronze statues.
b. Forood touched all types of statues in the gallery.

Finally, while the plural definites allow for non-universal readings in upward entailing contexts, *hame -i* DPs do not. While the sentence in (443-a) can be true in the scenario below, the sentence in (444) cannot be.

(447) *Scenario:* There were ten statues, each of a different type. Forood touched nine of them and no other statue. (443-a) = ✓, (444) = ✗

6.6 Conclusion

In this chapter, we have seen that the quantificational force of *hame -i* DPs varies between existential and universal and that the shift in quantificational force correlates with the monotonicity properties of the contexts where *hame -i* DPs appear: they express universal force in positive episodic sentences and can express existential force in downward monotone contexts.

We have also seen that, unsurprisingly, an analysis along the lines of Bar-Lev and Margulis (2014), according to which *hame -i* DPs are existential quantifiers that trigger domain but not scalar alternatives, captures the variation in quantificational force. If this analysis is on the right track, then, whether or not polarity items trigger scalar alternatives seems to be a genuine parameter of variation.

Chapter 7

Conclusion

This dissertation has analyzed FCIs, with a focus on Farsi, investigating their semantics and the underlying mechanisms that govern their distribution and interpretation. Across languages, FCIs are interpreted as existential DPs in DE contexts, but in modal contexts, they convey truth conditions stronger than those expected from existential DPs.

Within the alternative- and exhaustification-based theory of FCIs (Chierchia, 2013), these items are viewed as existential quantifiers, introducing into the semantic derivation scalar and domain alternatives. These alternatives are active and must be used up by a grammatical exhaustivity operator to strengthen the truth conditions of the sentences that contain FCIs.

This thesis has probed into the nature of the exhaustification process associated with FCIs through the analysis of a number of DPs in Farsi that exhibit core FCI behavior albeit with some variations. In particular, it has sought to address the questions posed in the introductory chapter to guide our investigation. These questions are repeated below.

(448)
a. Can the alternatives that FCIs activate ever be *deactivated*?
b. In which ways can the derivation of a contradiction be avoided?
c. What is the interplay between alternatives of different types? Are they independent?
d. Is the scope of the FCIs restricted?
e. What is the nature of the alternatives?

Chapter 2 and 3 provided insight into the typological variation among EFCIs by addressing the first three questions. As observed in Chapter 2, *yek -i* DPs reveal a distinct profile of EFCIs. While aligning with other EFCIs in DE and modal contexts, they depart when unembedded. Unlike some EFCIs, like Romanian *vreun*, they are grammatical in unembedded contexts, but, unlike other EFCIs that are grammatical in these contexts, they do not convey modality. Instead, they convey a uniqueness meaning component. Under Chierchia's analysis, in the absence of an intervening operator, excluding all types of alternative yields a contradiction. This explains the ungrammaticality of *vreun*-type EFCIs in unembedded contexts. Previous literature argued for the possibility of the insertion of a cover necessity modal as a last resort strategy to avoid contradiction. This strategy derives a modal meaning component, explaining the behavior of *irgendein*-type EFCIs. As demonstrated in this chapter, modal insertion cannot account for the behvior of *yek -i* DPs, suggesting that not all EFCIs use this strategy universally. We proposed an alternative strategy for avoiding the derivation of contradiction, moving beyond relying on covert modals as a last resort strategy. To account for the behvior of unembedded *yek -i* DPs, we argued that alternatives introduced by *yek -i* DPs can be pruned allowing for partial exhaustification with respect to a subset of alternatives, particularly with respect to scalar alternatives.

Chapter 3 shifted focus to the behavior of *yek -i* DPs in modal contexts, shedding light on the interplay between scalar and domain alternatives. The observation in this chapter provided support for splitting domain and scalar exhaustification, addressing the question in (448-c). As we have seen, unlike other EFCIs, *yek -i* DPs, when interpreted under modals, trigger an embedded uniqueness meaning component. Building upon this observation, we argued that the scalar and domain alternatives must be used up by independent exhaustification operators, and showed that exhaustification of the scalar alternatives, in the case of *yek -i* DPs, is always clause-bounded. We have seen that in DE contexts, this leads to global weakening, violating the Maximize Strength constraint. To address this, we proposed that the alternative that *yek -i* DPs induce, in particular the scalar alternatives, can get pruned to avoid global weakening, answering the question in (448-a).

Chapter 4 focused on UFCIs. Initially, we observed that *har -i* DPs behave similarly to other UFCIs. Moving beyound DE contexts, *har -i* DPs, just like other UFCIs, are grammatical with possibility modals, where they trigger a free choice effect, but ungrammatical with necessity modals and in unembedded contexts. Under the Wide Scope Constraint Analysis of UFCIs (Chierchia, 2013), exhaustification yields a contradiction. This contradiction is avoided, only with possibility modals, by ensuring that the modal domain of the modal component in the scalar alternative is contained within the modal domain of the modal component in the domain alternatives. our investigation into the combination of the accusative marker *-ro* with Farsi *har -i* DPs answered the question in (448-b), revealing another strategy for avoiding contradiction: neutralizing the alternatives. This suggests that certain morphological configurations can neutralize the FCI status by either delivering alternatives equivalent to the assertion or expressing a contradiction that can be excluded without consequences.

The Cross-linguistic variation in the distribution of FCIs was the focus of chapter 5, where we explored the contrast between *any* DPs and numeral *any* in Farsi. Contrary to *any* DPs and numeral *any*, the distribution of their counterparts in Farsi, *har -i* DPs and numeral *har* pattern alike. By adopting the Wide Scope Constraint Analysis, we proposed that *har -i* DPs must take wide scope. This answers the question posed in (448-d).

Finally, our findings in Chapter 6 answered the question in (448-e). This chapter showed that the quantificational force of *hame -i* DPs shift between existential and universal, a variability that correlates with the monotonicity properties of the contexts. Specifically, *hame -i* DPs have universal force in unembedded contexts, while they can have an existential interpretation in DE contexts. Our analysis, inspired by Bar-Lev and Margulis 2014, has proposed that *hame -i* DPs function as existential quantifiers that trigger domain but not scalar alternatives. This analysis effectively captures the variation in quantificational force exhibited by *hame -i* DPs across different linguistic contexts.

Bibliography

Aloni, M. (2007a). Expressing ignorance or indifference. Modal implicatures in BiOT. In B. ten Cate and H. Zeevat (Eds.), *Logic, Language, and Computation*, Heidelberg, pp. 1–20. Springer.

Aloni, M. (2007b). Indefinites and beyond. Evolutionary pragmatics and typological semantics. Technical report, University of Amsterdam. NWO *Vidi*-grant.

Aloni, M. (2012). On epistemic indefinites: A note on emphatic free choice uses. In A. Aguilar-Guevara, A. Chernilovskaya, and R. Nouwen (Eds.), *Proceedings of the 16th Sinn und Bedeutung*, Cambridge, MA, pp. 1–14. MIT Working Papers in Linguistics.

Aloni, M. and A. Port (2015). Epistemic indefinites and methods of identification. In L. Alonso-Ovalle and P. Menéndez-Benito (Eds.), *Epistemic Indefinites*, pp. 117–140. Oxford University Press.

Aloni, M. and R. van Rooij (2007). Free choice items and alternatives. In G. Bouma, I. Kraemer, and J.Zwarts (Eds.), *Proceedings of the KNAW Academy Colloquium: Cognitive Foundations of Interpretation*, pp. 5–26. Edita KNAW.

Alonso-Ovalle, L. (2008). Innocent exclusion in an alternative semantics. *Natural Language Semantics 16*(2), 115–128.

Alonso-Ovalle, L. and P. Menéndez-Benito (2010). Modal indefinites. *Natural Language Semantics 18*(1), 1–31.

Alonso-Ovalle, L. and P. Menéndez-Benito (2011). Domain restrictions, modal implicatures and plurality: Spanish *algunos*. *Journal of Semantics 28*(2), 211–240.

Alonso-Ovalle, L. and P. Menéndez-Benito (2013). Random choice modality: Spanish *uno cualquiera*. In E. Chemla, V. Homer, and G. Winterstein (Eds.), *Proceedings of the 17th Sinn und Bedeutung*, pp. 27–43.

Alonso-Ovalle, L. and P. Menéndez-Benito (2015a). Epistemic indefinites: An overview. In L. Alonso-Ovalle and P. Menéndez-Benito (Eds.), *Epistemic Indefinites*, pp. 1–30. Oxford University Press.

Alonso-Ovalle, L. and P. Menéndez-Benito (2015b). *Epistemic Indefinites. Exploring Modality Beyond the Verbal Domain.* Oxford University Press.

Alonso-Ovalle, L. and P. Menéndez-Benito (2018). Projecting possibilities in the nominal domain: Spanish *uno cualquiera*. *Journal of Semantics 35*(1), 1–41.

Alonso-Ovalle, L. and E. Moghiseh (2019a). Contradiction-free strengthening and alternative discharge: The case of Farsi *-i* indefinites. In M. Espinal, E. Castroviejo, M. Leonetti, L. McNally, and C. Real-Puigdollers (Eds.), *Proceedings of the 23rd Sinn und Bedeutung*, pp. 1–18.

Alonso-Ovalle, L. and E. Moghiseh (2019b). Neutralizing free choice items via maximal domain restriction: Farsi *i-* indefinites. In K. Blake, F. Davis, K. Lamp, and J. Rhyne (Eds.), *Proceedings of the 29th Semantics and Linguistic Theory*, pp. 686–705.

Alonso-Ovalle, L. and E. Moghiseh (2021). Numeral *any*: the view from Farsi. In J. Rhyne, K. Lamp, N. Dreier, , and C. Kwon (Eds.), *Proceedings of the 30th Semantics and Linguistic Theory*, pp. 485–503.

Alonso-Ovalle, L. and E. Moghiseh (2022). Universal force from exhaustification: Farsi *hame-i* DPs. In J. R. Starr, J. Kim, and B. Öney (Eds.), *Proceedings of the 32nd Semantics and Linguistic Theory*, pp. 619–638.

Bar-Lev, M. E. and D. Fox (2017). Universal free choice and innocent inclusion. In D. Burgdorf, J. Collard, S. Maspong, and B. Stefánsdóttir (Eds.), *Proceedings of the 27th Semantics and Linguistic Theory*, pp. 95–115.

Bar-Lev, M. E. and D. Margulis (2014). Hebrew *kol*: a universal quantifier as an undercover existential. In U. Etxeberria, A. Fălăuş, A. Irurtzun, and B. Leferman (Eds.), *Proceedings of the 18th Sinn und Bedeutung*, pp. 60–76.

Buccola, B. and A. Haida (2017). Expressing agent indifference in German. In A. Cremers, T. van Gessel, and F. Roelofsen (Eds.), *Proceedings of the 21st Amsterdam Colloquium*, pp. 165–173. University of Amsterdam.

Chierchia, G. (2013). *Logic in Grammar*. Oxford: Oxford University Press.

Chierchia, G. and H.-C. D. Liao (2015). Sinhala epistemic indefinites with a certain *je ne sais quoi*. In L. Alonso-Ovalle and P. Menéndez-Benito (Eds.), *Epistemic Indefinites*, pp. 31–59. Oxford University Press.

Dayal, V. (1995). Quantification in correlatives. In E. B. *et al.* (Ed.), *Quantification in Natural Languages*, pp. 179–205. Dordrecht: Kluwer.

Dayal, V. (1998). *Any* as inherently modal. *Linguistics and Philosophy 21*(5), 433–476.

Dayal, V. (2005). The universal force of free choice *any*. *Linguistic Variation Yearbook 4*(1), 5–40.

Dayal, V. (2013). A viability constraint on alternatives for free choice. In A. Fălăuş (Ed.), *Alternatives in Semantics*, pp. 88–122. Palgrave Macmillan.

Deal, A. R. and A. Farudi (2007). Alternatives for Persian indefinites. UMass ms.

Farkas, D. (2006). Free choice in Romanian. In B. J. Birner and G. Ward (Eds.), *Drawing the Boundaries of Meaning, Neo-Gricean Studies in Pragmatics and Semantics in Honor of Laurence R. Horn*, pp. 71–94. Amsterdam: John Benjamins.

von Fintel, K. (1993). Exceptive constructions. *Natural Language Semantics 1*(2), 123–148.

von Fintel, K. (2000). Whatever. In B. Jackson and T. Matthews (Eds.), *Proceedings of the 10th Semantics and Linguistic Theory*, pp. 27–40.

von Fintel, K. (2001). Counterfactuals in a dynamic context. In M. Kenstowicz (Ed.), *Ken Hale. A Life in Language*, pp. 123–153. Cambridge, MA: The MIT Press.

Fox, D. (2007). Free choice and the theory of scalar implicatures. In U. Sauerland and P. Stateva (Eds.), *Presupposition and Implicature in Compositional Semantics*, pp. 71–120. Palgrave MacMillan.

Fălăuş, A. (2014). (Partially) free choice of alternatives. *Linguistics and Philosophy 37*(2), 121–173.

Fălăuş, A. (2015). Romanian epistemic indefinites. In L. Alonso-Ovalle and P. M. Benito (Eds.), *Epistemic Indefinites*, pp. 60–81. Oxford University Press.

Gajewski, J. (2002). L-analycity in natural language. Unpublished ms. UConn.

Giannakidou, A. and J. Quer (2013). Exhaustive and non-exhaustive variation with free choice and referential vagueness: Evidence from Greek, Catalan, and Spanish. *Lingua 126*(0), 120 – 149.

Hosseini Fatemi, M. (2013). The semantics of the Persian object marker *-ra*. Master's thesis, Carleton University.

Jasbi, M. (2016). Three types of indefinites in Persian: Simple, complex, and antidefinite. In M. Moroney, C.-R. Little, J. Collard, and D. Burgdorf (Eds.), *Proceedings of the 26th Semantics and Linguistic Theory*, pp. 244–263.

Jasbi, M. (2020). The meaning of the Persian object marker *rā*: What it is not, and what it (probably) is. In R. K. Larson, S. Moradi, and V. Samiian (Eds.), *Current Issues in Linguistic Theory*, pp. 119–135. John Benjamins Publishing Company.

Jayez, J. and L. Tovena (2002). Determiners and (Un)certainty. In B. Jackson (Ed.), *Proceedings of the 12th Semantics and Linguistic Theory*, pp. 164–183.

Jayez, J. and L. M. Tovena (2006). Epistemic determiners. *Journal of Semantics 23*(3), 217–250.

Kratzer, A. and J. Shimoyama (2002). Indeterminate pronouns: The view from Japanese. In Y. Otsu (Ed.), *Third Tokyo Conference on Psycholinguistics*, pp. 1–25.

Krifka, M. (1991). Some remarks on polarity items. In D. Zaefferer (Ed.), *Semantic Universals and Universal Semantics*, pp. 150–189. Berlin: Foris-de Gruyter.

Krifka, M. (1995). The semantics and pragmatics of polarity items. *Linguistic Analysis 25*, 209–257.

Krifka, M. and F. Modarresi (2016). Number neutrality and anaphoric update of pseudo-incorporated nominals in Persian (and weak definites in English). In M. Moroney, C.-R. Little, J. Collard, and D. Burgdorf (Eds.), *Proceedings of the 26th Semantics and Linguistic Theory*, pp. 874–891.

Ladusaw, W. A. (1979). *Polarity Sensitivity as Inherent Scope Relations.* Ph. D. thesis, The University of Texas at Austin.

Lauer, S. (2010). Some news about *irgendein* and *algún*. Talk presented at Workshop on Epistemic Indefinites, University of Göttingen, June 10-12 2010.

Legrand, J. E. (1975). Or *and* Any*: The Semantics and Syntax of Two Logical Operators*. Ph. D. thesis, University of Chicago.

López, L. (2012). *Indefinite Objects: Scrambling, Choice Functions, and Differential Marking*. Cambridge, MA: MIT Press.

Menéndez-Benito, P. (2005). *The Grammar of Choice*. Ph. D. thesis, University of Massachusetts Amherst, Amherst, MA.

Menéndez-Benito, P. (2010). On universal free choice items. *Natural Language Semantics 14*(1), 33–64.

Modarresi, F. and A. Simonenko (2007). Quasi noun incorporation in Persian. In M. Kokkonidis (Ed.), *Proceedings of LingO: The Second Oxford Postgraduate Conference in Linguistics*, pp. 181–186.

Moghiseh, E. (2020). Locally exhaustified scalar alternatives: Farsi *yek -i* DPs. Unpublished evaluation paper, McGill University.

Schwarzschild, R. (2002). Singleton indefinites. *Journal of Semantics 19*(3), 289–314.

Scontras, G. (2022). On the semantics of number morphology. *Linguistics and Philosophy 45*(5), 1165–1196.

Šimík, R. (2013). Epistemic indefinites under epistemic modals in Czech. In G. Zybatow, P. Biskup, M. Guhl, C. Hurtig, O. Mueller-Reichau, and M. Yastrebova (Eds.), *Slavic grammar from a formal perspective. The 10th Anniversary FDSL Conference, Leipzig*, Volume 10, pp. 425–442.

Slade, B. (2015). Sinhala epistemic indefinites with a certain *je ne sais quoi*. In L. Alonso-Ovalle and P. Menéndez-Benito (Eds.), *Epistemic Indefinites*, pp. 82–99. Oxford University Press.

Zamparelli, R. (2007). On singular existential quantifiers in Italian. In I. Comorovski and K. von Heusinger (Eds.), *Existence: Semantics and Syntax*, pp. 293–328. Dordrecht: Springer.

Zwarts, F. (1998). Three types of polarity. In F. Hamm and E. Hinrichs (Eds.), *Plurality and Quantification*, pp. 177–238. Dordrecht: Springer.