# SEMANTICS OF TURKISH FREE CONDITIONALS

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# SEMANTICS OF TURKISH FREE CONDITIONALS

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ABSTRACT

Semantics of Turkish Free Conditionals

The aim of the present research is to provide a novel compositional semantic analysis for Turkish conditional sentences with *wh*-phrases in their antecedents (*wh*-conditionals henceforth), which are ambiguous between question and free conditional readings, the latter being the term I use for what roughly corresponds to English sentences with *wh*-ever phrases. Demirok (2017) is the only existing analysis of free conditionals in Turkish, which builds on Rawlins (2013). I show that Demirok's and Rawlins's view, which assumes Hamblin's (1973) semantics of *wh*-phrases, overgenerates, thus I suggest an alternative to it which assumes Rullman and Beck's (1998) semantics of *wh*-phrases as restricted variables, instead. I argue that a *wh*-phrase can be bound by a universal modal operator, and this results in a free conditional reading, whereas, when it is bound by a question operator (as in Rullman and Beck, 1998), the question reading arises. Lastly, I turn to free conditionals involving an existential modal, and observe that one needs to stipulate the presence of a covert universal modal in them, in order to account for their truth conditions. The proposal in this dissertation contributes a new perspective on *wh*-conditionals in Turkish and possibly in other languages, which exhibit similar structures.

# ÖZET

## Türkçedeki Bağımsız Koşul Cümlelerinin Anlambilimi

Bu araştırmanın amacı Türkçede öncül tümcelerinde *ne*-öbekleri bulunduran koşul cümleleri (*ne*-koşul cümleleri olmak üzere) için bileşimsel olarak yeni bir anlambilimsel analiz sunmaktır. Bu türdeki cümleler soru anlamı ve bağımsız koşul cümlesi anlamları arasında belirsizdirler. Bağımsız koşul cümlesi terimini İngilizcedeki *ne*-öbeği ve hiç sözcüklerinin bileşiminin verdiği yapıların ve anlamlarının Türkçedeki karşılığı olarak kullanmaktayım. Türkçedeki bağımsız koşul cümlelerinin anlambilimsel çalışması için literatürde sunulan tek analiz Demirok'undur (2017) ve bu analiz Hamblin'in (1973) *ne*-öbekleri üzerine olan çalışmasına bağlı olarak geliştirilen Rawlins'in (2013) analizini temel almaktadır. Bu tezde, Demirok ve Rawlins'in analizlerinin Türkçede aşırı üretme ile sonuçlandığını gösterip Rullman ve Beck'in (1998) *ne*-öbekleri için sunduğu sınırlı değişken analizine bağlı kalarak farklı bir anlambilimsel analiz sunmaktayım. Türkçedeki *ne*-sözcüklerinin evrensel kip tarafından bağlandığında bağımsız koşul cümlesi oluşturduğunu, soru işleyicisi tarafından bağlandığında ise soru cümlesi oluşturduğunu savunmaktayım. Son olarak, açık varoluşsal kip bulunan bağımsız koşul cümlelerinin doğruluk koşullarını sağlayabilmek için bu yapılarda örtük evrensel kipin bulunduğunu savunarak çift kipli bir analiz önermekteyim. Bu öneri ışığında, bu tez Türkçedeki ve muhtemelen diğer dillerdeki bağımsız koşul cümleleri için yeni bir bakış açısı kazandırmaktadır.

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# ABBREVIATIONS

| | |
|---|---|
| 1 | First person |
| 2 | Second person |
| 3 | Third person |
| ABL | Ablative |
| ACC | Accusative |
| AOR | Aorist |
| COM | Comitative |
| DAT | Dative |
| EVID | Evidential |
| FUT | Future |
| GEN | Genitive |
| GM | Generalizing Marker |
| LOC | Locative |
| NECC | Necessity |
| NMLZ | Nominalizer |
| PL | Plural |
| POSS | Possessive |
| PRG | Progressive |
| PRM | Permission |
| PSB | Possibility |
| PST | Past |
| SG | Singular |
| ∀ | Universal |

| | |
|---|---|
| ∃ | Existential |
| @ | Actual World |

# CHAPTER 1

# INTRODUCTION

Turkish allows *wh*-phrases to occur in conditional antecedents (henceforth *wh*-conditionals). The following example in (1) shows this.

(1) [$_{\text{antecedent}}$ Parti-ye kim gel-ir ise] [ $_{\text{main clause}}$ eğlen-ir./?]
Party-DAT who come-AOR-ise have-fun-AOR

(i) Free Conditional: 'Whoever comes to the party has fun'

(ii) Question: 'Who$_1$ is such that if t$_1$ comes to the party, (s/)he$_1$ has fun?'

As (1) shows, such sentences are ambiguous. The first reading is a declarative one which I call free conditional (henceforth FC) and it can be roughly translated as a *wh*-ever construction in English. The second reading is a matrix question. Intonation help to disambiguate between these two interpretations. Turkish *wh*-questions are pronounced with a final rising intonation while declaratives with a falling one (Göksel et al., 2009). Predictably, a final rising intonation of (1) will select the question interpretation, while the free conditional reading is indicated by a falling intonation.

As opposed to this example, when a *wh*-phrase occurs in the consequent clause, as in (2), the only available reading is a matrix question one.

(2) [$_{\text{antecedent}}$ John parti-ye gel-ir-se] [$_{\text{main clause}}$ on-a ne
John party-DAT come-AOR-ise him-DAT what
di-yecek-sin]?
tell-FUT-2.SG

'If John comes to the party, what will you tell him?'

What this contrast shows is twofold: i. constituent questions in Turkish are island insensitive (see Özsoy, 1996; Arslan, 1999; Görgülü, 2006; Demirok, 2019) and ii.

only *wh*-phrases in the antecedent of a conditional may be used to express declarative *wh*-ever constructions. Whereas all argument *wh*-phrases are island insensitive, Özsoy (1996) observes that some adjunct *wh*-phrases are, and some aren't. Among the latter is *neden* ('why'). The contrast between (3), with an argument *wh*-phrase and (4), with an adjunct *wh*-phrase, *neden*, shows this (Özsoy, 1996, p.139).

(3) Kim-in yaz-dığ-ı mektub-u oku-du-n?
Who-GEN write-REL-POSS letter-ACC read-PST-2.SG

'Who did you read [the letter [*t* wrote]]?'

(4) *Adam-ın neden yaz-dığ-ı mektup uzun?
Man-GEN why write-REL-POSS letter-ACC long

Intended Meaning: 'Why is [the letter [the man wrote t]] long?'

Although, complex NPs are known to be islands for the extraction of a *wh*-phrase (Ross, 1967), (3) is a grammatical matrix question, apparently violating Ross's generalization. If one assumes that *wh*-movement to CP (overt or covert) is compulsory in questions (see Karttunen, (1977)), the argument *wh*-phrase in (3) can be extracted out of an island. In contrast, (4), with an adjunct *wh*-phrase is ungrammatical which suggests that this adjunct *wh*-phrase is island sensitive. Predictably, when *neden* occurs in the antecedent of a conditional, which is also an island (Ross,1967), only a free conditional reading is available, and the matrix question reading is not allowed. (5) shows this.[1]

[1] Note that not all adjunct *wh*-phrases exhibit this property. For instance, *nasıl*, ('how') as an adjunct *wh*-phrase still show island insensitive behaviours as (1) show.

(1) Ayşe nasıl çalış-sa sınavı geç-er./?
Ayşe how study-sA exam-ACC pass-AOR
FC: 'No matter how Ayşe studies, she passes the exam.'
Question: 'Ayşe passes the exam if she studies how?'

Similarly, *ne zaman* ('what time') can occur in the antecedent of a conditional and a matrix reading along with the free conditional one is available. For such distinctions between adjunct *wh*-phrases, I don't provide an analysis. This is way beyond the scope of this thesis. See Özsoy (1996), Arslan (1999), Görgülü (2006) for related discussions.

(5) Ayşe neden gid-iyor ise Ali de on-dan gid-iyor.
Ayşe why go-PRG ise Ali too that-ABL go-PRG

'Whichever is the reason why Ayşe is going, Ali is going for the same reason.'

In the coming sections of this chapter, I first show that the phenomena observed here are fully productive; that is, they surface regardless of the choice of the *wh*-phrase or of the type of the conditional. Then, I discuss the ambiguity in (1) in more detail. Before concluding, I will outline the content of this thesis.

## 1.1 Turkish free conditionals with different markers

There are three different markers of conditionals in Turkish: *ise* (contracted form as *-(y)sA*), *-sA* and *-sAydI* (combination of *-sA* with the past tense marker *-DI*) which I refer to as indicative, subjunctive and counterfactual conditionals respectively, following Göksel and Kerslake (2005). The three markers result in semantic differences as shown by the following examples in (6), (7) and (8).

(6) Ali gelir ise Ayşe mutlu ol-ur.
Ali come-AOR ise Ayşe happy become-AOR

'If Ali comes, Ayşe becomes happy.'

(7) Ali gel-se Ayşe mutlu ol-ur.
Ali come-sA Ayşe happy become-AOR

'If Ali came, Ayşe would be happy.'

(8) Ali gel-se-ydi Ayşe mutlu ol-ur-du.
Ali come-sA-PST Ayşe happy become-AOR-PST

'If Ali had come, Ayşe would have been happy.'

Göksel and Kerslake (2005) describe these differences as follows. The indicative conditional in (6) conveys that the speaker is neutral on whether Ali comes or not. In contrast, the corresponding subjunctive sentence with *-sA* conveys that the speaker

finds Ali's coming less likely. Lastly, (8) is a counterfactual conditional, and it conveys that the speaker believes that Ali didn't come. *Wh*-conditionals can involve the same different markers and tenses as shown in (9), (10) and (11) respectively.

(9) Parti-ye kim gel-ir-se eğlen-ir./?
Party-DAT who come-AOR-ise have-fun-AOR

(i) F.C: 'Whoever comes to the party has fun.'

(ii) Question: 'Who$_1$ is such that if $t_1$ comes to the party, (s/)he$_1$ has fun?'

(10) Parti-ye kim gel-se eğlen-ir./?
Party-DAT who come-sA have-fun-AOR

(i) F.C.: 'Whoever came to the party would have fun.'

(ii) Question: 'Who$_1$ is such that if $t_1$ came to the party, (s/)he$_1$ would have fun?

(11) Parti-ye kim gel-se-ydi eğlen-ir-di./?
Party-DAT who come-sA-PST have-fun-AOR-PST

(i) F.C.: 'Whoever had come to the party would have had fun.'

(ii) Question: Who$_1$ is such that if $t_1$ had come to the party, (s/)he$_1$ would have had fun?

Noticeably, meaning differences that are similar to those between the three types of regular conditionals surface also among in the above examples.[2] In this sense, conditionals with *kim* ('who') in their antecedents are as productive as regular conditionals.

[2]Note that providing an explanation of the interpretation differences between sentences (9-11) is beyond the scope of this thesis.

1.2 Turkish free conditionals with different *wh*-phrases

Besides different markers of conditionals, the semantics effect I observed in (1) can be replicated with different *wh*-phrases, as shown in the following examples in (12), (13), (14) and (15).

(12) Ayşe ne pişir-ir-se / pişir-se / pişir-se-ydi Ali
Ayşe what cook-AOR-ise / cook-sA / cook-sA-PST Ali
ye-r / ye-r-di./?
eat-AOR / eat-AOR-PST

(i) FC: 'Whatever Ayşe cooks / cooked / had cooked, Ali eats / would eat / would have eaten it.'

(ii) Question: 'What$_1$ is such that if Ayşe cooks / cooked / had cooked $t_1$, Ali eats / would eat / would have eaten it$_1$?'

(13) Ayşe ne zaman bir yere gid-er-se / git-se / git-se-ydi
Ayşe what time somewhere go-AOR-ise / go-sA / go-sA-PST
Ali üzül-ür / üzül-ür-dü./?
Ali get-sad-AOR get-sad-AOR-PST

(i) FC: 'Whenever Ayşe goes / went / had gone somewhere, Ali gets sad / would get sad / would have got sad.'

(ii) Question: 'When is such that if Ayşe goes / went / had gone somewhere, Ali gets sad / would get sad / would have got sad?'

(14) Ayşe nereye gid-er-se / git-se / git-se-ydi Ali on-u
Ayşe where go-AOR-ise / go-sA / go-sA-PST Ali her
takip ed-er / takip ed-er-di./?
follow-AOR / follow-AOR-PST

(i) FC: 'Wherever Ayşe goes / went / had gone, Ali follows / would follow / would have followed her.'

(ii) Question: 'Where$_1$ is such that if Ayşe goes / went / had gone to $t_1$, Ali follows / would follow / would have followed her?

(15) Ayşe hangi telefon-u iste-r-se / iste-se / iste-se-ydi
Ayşe which phone-ACC want-AOR-ise / want-sA / want-sA-PST
baba-sı al-ır / al-ır-dı./?
father-POSS buy-AOR / buy-AOR-PST

(i) FC: 'Whichever phone Ayşe asks for / asked for / had asked for, her father buys / would buy / would have bought it.'

(ii) Question: '[Which phone]$_1$ is such that if Ayşe asks for / asked for / had asked for $t_1$, her father buys / would buy / would have bought $it_1$?'

As the above examples show, it is possible to have combinations with various *wh*-phrases such as *what*, *who which NP* etc., and different markers of conditionals. This once more shows that Turkish *wh*-conditionals are very productive.

Summing up, a Turkish *wh*-conditional consists of any type of conditional with any type of *wh*-phrases in its antecedent, and all may receive at least free conditional interpretation.

### 1.3 Ambiguity of Turkish *wh*-conditionals

As mentioned above, unlike regular conditionals, the conditionals with *wh*-phrases in their antecedents are ambiguous between plain questions and free conditionals as repeated in (16).

(16) Partiye kim gel-se eğlen-ir./?
Party-DAT who come-sA have-fun-AOR

(i) FC: 'Whoever comes to the party has fun.'

(ii) Question: 'Who$_1$ is such that if $t_1$ comes to the party (s/)he$_1$ has fun?'

Given that argument *wh*-phrases are not sensitive to island constraints in Turkish (Özsoy, 1996; Arslan, 1999; Görgülü, 2006 and Demirok, 2019 among many others),

the matrix question reading is an expected one. What is challenging is how the free conditional readings can be obtained compositionally. This is the main concern of this thesis.

One more matter to be addressed is the interpretation of the pronoun in the main clause as deictic or contingent on the antecedent clause. When combined with the two readings that I described above, these sentences are four-way ambiguous. (17) illustrates this ambiguity.

(17) [$_{\text{antecedent}}$ Partiye kim gel-se] [$_{\text{main clause}}$ (o) eğlen-ir.]
Party-DAT who come-sA (s/he) have-fun-AOR[3]

(i) Contingent FC (CFC) Reading: 'Whoever$_1$ comes to the party, (s/)he$_1$ has fun.'

(ii) Deictic FC (DFC) Reading: 'Whoever$_1$ comes to the party, he$_2$ (e.g: Bill) has fun.'

(iii) Contingent Question (CQ) Reading: 'Who$_1$ is such that if t$_1$ comes to the party, (s/)he$_1$ has fun?'[4]

(iv) Deictic Question (DQ) Reading: 'Who$_1$ is such that if t$_1$ comes to the party, he$_2$ (e.g: Bill) has fun?'

As (17) shows, the first two readings are declarative (free conditional) readings, and the other ones are question readings. Each reading has its own specific features that lead them to have different meanings. In what I called the contingent free conditional reading, (17(i)), the pronoun in the consequent clause varies depending on the

[3] Here, I intentionally used a subjunctive *wh*-conditional example, with marker *-sA,* to show the four-way ambiguity. In indicative *wh*-conditionals, with *ise,* the deictic free conditional reading doesn't arise.

[4] Note that when we have the pronoun overtly, some people don't accept that the contingent question reading is present. I asked people informally whether they have this reading, and some didn't accept, while some did, including me. It seems that when we have the pronoun overtly, contingent question readings are subject to a micro-variation. As for this issue, I leave it to further research and I treat them as four-way ambiguous, only considering the maximally permissive speaker judgments.

antecedent clause. To make it more concrete, the pronoun in (17(i)) can be rephrased as 'the people who come to the party'. For instance, if Ali and Veli come to the party, Ali and Veli have fun or if Safiye and Mehmet come to the party, Safiye and Mehmet have fun, and so on. In a way, the assertion is that those who come to the party have fun. In contrast, in the deictic free conditional reading, (17(ii)), the pronoun is deictic and therefore it gets its referent from the context of utterance. For example, if Bill is the unique salient person in the context, (17(ii)) asserts that regardless of the identity of the people who come to the party, Bill has fun. For instance, whether Ayşe comes to the party or John comes to the party or both come; in all cases, Bill has fun. A similar ambiguity is observed in the question case. In the contingent question reading (17(iii)), the pronoun varies depending on the antecedent clause, while, in the deictic question reading (17(iv)), the pronoun is referential, i.e., it doesn't vary depending on the antecedent clause. Again, if Bill is the salient person, the speaker wants to learn the identity of the people whose coming to the party will coincide with Bill's having fun.

Given this, in the free readings, the anaphoric resolution of the pronouns in the consequent is straightforward, in that the pronoun gets its referent via contextual information. In contrast, the contingent readings are less straightforward. This is because, whereas the pronoun varies depending on the meaning of the antecedent clause, binding doesn't appear to be possible, considering the fact that the pronoun is not in the scope of the *wh*-phrase, *kim* ('who'). A simplified LF in (18) which adopts the restrictive *if*-clause analysis of Kratzer (1986) shows this.

(18) [[Modal if who comes to the party] (s/)he has fun]

A solution, Demirok (2017) proposes, is that these are occurrences of E-type pronouns (Heim, 1990), that is implicit definite descriptions with a pronominal

restrictor whose antecedent is linguistically available. In the examples under consideration, the antecedent is the predicate *come the party*, thus the pronoun is interpreted as 'the ones that come to the party'. As far as contingent free conditionals are concerned, I will adopt this analysis. However, for contingent questions, I will argue that binding becomes possible if one assumes Rullman and Beck's (1998) semantics of interrogatives.

The rest of the thesis discusses the phenomena introduced here. First, I will illustrate Demirok's (2017) analysis of Turkish free conditionals and argue that it results in overgeneration. I will identify the problem in the assumption of Hamblin's (1973) semantics of *wh*-expressions. Given this, I propose to adopt, Rullman and Beck's (1998) proposal, instead, according to which *wh*-phrases are restrictive variables bound by a higher question operator. As for the conditional component, I adopt Kratzer's (1986) view that *if*-clauses contribute to the restrictor of modals. With these ingredients at hand, I assume that variables introduced by *wh*-phrases can be bound by modals, like Heimian indefinites (Heim, 1982), in which case a free conditional reading results. In contrast, when a question operator binds the *wh*-phrase, the question reading arises. This analysis will be shown to overcome the problem of overgeneration that Demirok's (2017) analysis faces.

Chapter 4 concerns a potential problem for my analysis. While the analysis predicts that the quantificational force of the *wh*-phrases is actually the force of the modal, in free conditionals with *-Abil* [5] ('can') this prediction isn't borne out (see (19)).

[5] Note that *-Abil* has different uses in Turkish. It can also convey the meaning of ability, permission along with its possibility meaning. In this case, I intend to use it as the possibility marker.

(19) Partiye kim gel-se eğlen-ebil-ir
Party-DAT who come-sA have-fun-PSB-AOR

'Whoever comes to the party might have fun'

As mentioned above, in free conditional readings, I argue that modals bind the *wh*-phrases. As a result, my analysis predicts the following paraphrased reading in (20) for (19).

(20) Some person who would come to the party would have fun.

However, the natural reading of (19) is closer to (21).

(21) Every person who would come to the party would have fun.

In order to fix this problem, I will propose a double-modal analysis for free conditionals inspired to von Fintel and Iatridou's (2005) analysis of anankastic conditionals. However, I will also show that, in order to prevent the reading in (20), further arguable stipulations about which modals can bind individual variables will be needed.

## 1.4 Outline of the thesis

Chapter 2 introduces the theoretical framework and technical apparatus I adopt in my proposal, namely von Fintel and Heim's (2011) intensional semantics, Kratzer's (1986) conditional analysis, and Rullman and Beck's (1998) semantics of *which* questions. In Chapter 3, I present my proposal and compare it to Demirok's (2017). In Chapter 4, I introduce and discuss the problem of free conditionals with overt existential modals. In Chapter 5 are my conclusions.

# CHAPTER 2

# THEORETICAL BACKGROUND

## 2.1 Introduction

In this chapter, I introduce the theoretical framework I adopt in the remainder of this thesis. I start with a brief illustration of von Fintel and Heim's (2011) intensional semantics. Following that, I will present the theories I assume with regards to the semantics of conditionals and the semantics of *wh*-phrases, which are the building blocks of my compositional theory of Turkish *wh*-conditionals. As for the latter, I borrow from Rullman and Beck's (1998) analysis of *which* questions. After summarizing the relevant aspects of their account, I will illustrate how von Fintel and Heim (2001) extends it to all *wh*-questions. Finally, I will turn to Kratzer's (1986) view on conditionals and its implementation in von Fintel and Heim (2011).

## 2.2 Possible World Semantics

In this thesis, I adopt Lewis's (1979) possible world theory of intensionality. As far as technical implementation of this theory, I adopt von Fintel and Heim's (2011) compositional analysis, within which intensions are brought into composition only when required by the following rule of Intensional Function Application (von Fintel & Heim, 2011, p.25) as in (1).

(1) Intensional Function Application (IFA) Rule

"If $\alpha$ is a branching node and $\{\beta,\gamma\}$ are the set of its daughters, then, for any world w and assignment g, if $[\![\beta]\!]^{w,g}$ is a function whose domain contains $[\![\gamma]\!]^{g}_{\not<}$, then $[\![\alpha]\!]^{w,g} = [\![\beta]\!]^{w,g}([\![\gamma]\!]^{g}_{\not<})$."

Otherwise, the semantic compositional system combines world dependent extensions with world dependent extensions via minimal modifications of the extensional rules of Function Application (FA), Predicate Modification (PM) and Predicate Abstraction (PA) by Heim and Kratzer (1998) (henceforth H&K). For instance, in (2), *believe* is an intensional verb, since it combines with a proposition, i.e., it requires an argument of type <*s,t*>. The following set of semantic operations in (3) take place to obtain the correct truth conditions.

(2) Safiye believes that Chandler loves Monica.

(3) For any possible world w and any assignment function g,

$[\![\textit{Safiye believes that Chandler loves Monica}]\!]^{w,g}$

$[\![\textit{love}]\!]^{w,g}$ ($[\![\textit{Monica}]\!]^{w,g}$)($[\![\textit{Chandler}]\!]^{w,g}$) = 1 iff

Chandler loves Monica in w. (by FA)

Given this:

$\lambda w.\ [\![\textit{Chandler loves Monica}]\!]^{w,g} =$

$\lambda w.$ Chandler loves Monica in w.

$[\![\textit{believe}]\!]^{w,g} = \lambda p_{<s,t>}.\ \lambda x.\ \forall w'$ compatible with x's beliefs in w: p(w') = 1 (von Fintel & Heim, 2011, p. 20))

$[\![\textit{believe}]\!]^{w,g}([\![\textit{Chandler loves Monica}]\!]^{g}_{\not\subset})$

$=[\lambda p_{<s,t>}.\ \lambda x.\ \forall w'$ compatible with x's beliefs in w: p(w') = 1]

([$\lambda w''$. Chandler loves Monica in w'']$)$

$= \lambda x.\ \forall w'$ compatible with x's belief in w, Chandler loves Monica in w'. (by IFA)

$[\![\textit{believe Chandler loves Monica}]\!]^{w,g}([\![\textit{Safiye}]\!]^{w,g}) = 1$ iff

$\forall w'$ compatible with Safiye's beliefs in w, Chandler loves Monica in w'. (by FA)

As (3) shows, intensions are not brought into composition until the verb *believe* is encountered. We obtain the truth condition in an arbitrary world for the sentence *Chandler loves Monica* by regular function application and can derive from them the intension of the sentence. Since *believe* is an intensional operator, IFA applies. Accordingly, the intension of the sentence *Chandler loves Monica* becomes the argument of *believe*. This is how we obtain the truth condition of a sentence within an intensional context in the possible world semantics.

### 2.3 Rullman and Beck (1998): *Wh*-words as restricted variables

This section introduces von Fintel and Heim's (2001) rendition of Rullman and Beck's (1998) semantics of *wh*-interrogatives (henceforth R&B).[6] Since this account builds on Kartunnen (1977)[7], I will briefly introduce the relevant aspects of the latter. Following Hamblin (1973), Kartunnen proposes that questions denote the sets of propositions that constitute their answers. Departing from Hamblin, Kartunnen's question analysis divides the labor of forming a set of propositions and generating the desired alternatives in it between a (covert) question morpheme (*?*) in C and *wh*`-quantificational phrases overtly or covertly raised above it. Specifically, the semantic function of *?* is to combine with a proposition (an argument of type <*s,t*>) and generate the singleton set having it as its sole element, i.e., the characteristic function of such a set. Hence, it lifts an argument of type <*s,t*> to type <*st,t*>. The proposition in this set contains as many variables as there are *wh*-phrases in the structure and each such variable is in turn bound by a co-indexed *wh*-phrase, with the result of generating alternative propositions in the set. For instance, the question in

[6] The reason why I adopt this modification of R&B, is that it extends the insights of their proposal for *which*-phrases to all *wh*-phrases.
[7] Note that I introduce Kartunnen (1977) question semantics as in the rendition of von Fintel and Heim (2001).

(4) has the interpreted LF in Figure 1 (see a similar example in von Fintel and Heim, 2001, p.8).

(4) Which girl came?

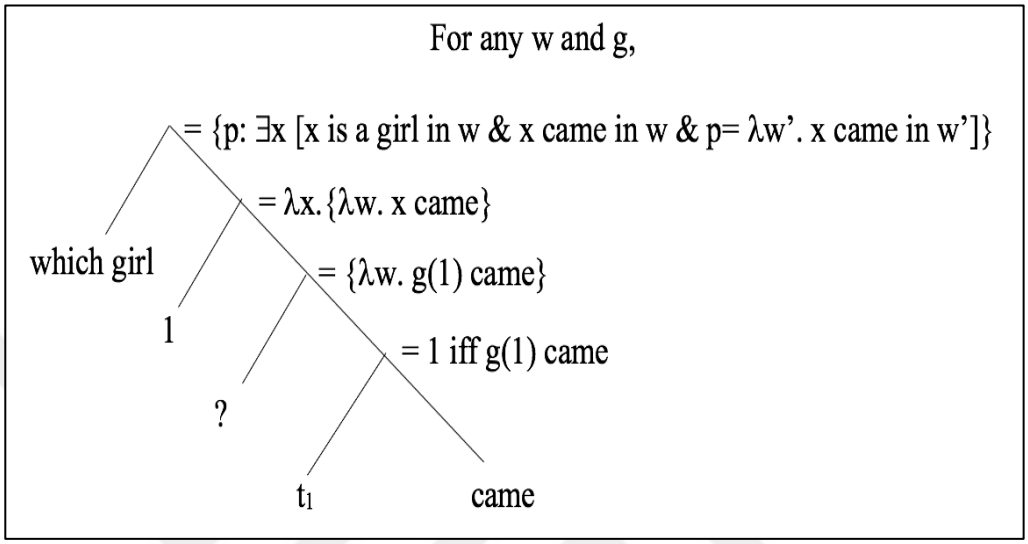



Figure 1. Kartunnen (1977) question LF

As Figure 1 illustrates, according to Kartunnen (1977), *?,* which has the following denotation in (5), returns the set containing the open proposition *that g(1) came* in its argument position.

(5) $[\![?]\!]^{w,g} = \lambda p.\ \{p\}$ (in set talk)

$= \lambda p.\ \lambda q.\ q = p$ (in functional terms)

The variable in the proposition gets bound and quantified over in two steps according to H&K system. First, Predicate Abstraction rule forms a predicate of type $<e,<st,t>>$, then the *wh*-phase, with the following denotation in (6) applies to the latter and generates the desired alternatives. The question denotation in Figure 1 is repeated here as (7).

(6) $[\![\textit{which girl}]\!]^{w,g} = \lambda Q_{<e<st,t>>}.\ \{p: \exists x_e\ [\ [\![\text{girl}]\!]^{w,g}(x) = 1\ \&\ p \in Q(x)\}$

(7) $[\![\textit{Which girl came?}]\!]^{w,g}$ = {p: ∃x [x is a girl in w & p = λw'. x came in w']}

Turning now to Rullman and Beck (1998)[8], they maintain Kartunnen's division of labor, but differ from Kartunnen's analysis in that they propose that *wh*-phrases are interpreted in their base position and don't denote (question) quantifiers. Specifically, extending Heim's (1982) semantics of indefinites, they propose that *wh*-phrases introduce restricted variables and are unselectively bound by a covert question operator in the structure. Unlike Kartunnen, according to R&B, the question operator that is co-indexed with *wh*-phrases is responsible for quantifying over the restricted variables. For example, according to this theory, the denotation of *who* is as in (8) below.

(8) For any world w, and any assignment function g,
$[\![\textit{who}_i]\!]^{w,g}$ is defined iff g(i) is a person in w, if defined
$[\![\textit{who}_i]\!]^{w,g}$ = g(1)

As (8) shows, according to this view, *wh*-phases like *who* denote variables of type *e* and their restrictor merely introduces the presupposition that the variable is an element of it. Similarly, *what* and *which thing*, denote variables of type *e* but they have a denotation only if the value of the variable is a thing.

Whereas binding is achieved through indexes inserted below the question operator (*?*), the burden of creating alternatives is on *?*. The interpretation of the *?* morpheme is as in (9).

(9) $[\![?]\!]^{w,g} = \lambda Q_{<s,<e\ldots,t>>}.\ \{p: \exists x_1 \ldots \exists x_n.\ p = \lambda w'.\ Q(w')(x_1)\ldots(x_n)\}$

As (9) shows, the lexical entry for the question morpheme is polyadic which allows the unselective binding of n number of *wh*-phrases. For instance, if there are two *wh*-

[8] Here, I use the extension of R&B analysis according to von Fintel and Heim (2001).

phrases in a sentence, the question morpheme will have type <*s*<*e*<*e,t*>>, or if there is only one, its type will be <*s,*<*e,t*>> and so on.

Accordingly, a question as in (10) below has the following LF in Figure 2 and its denotation is derived as shown in (11).

(10) Who left?

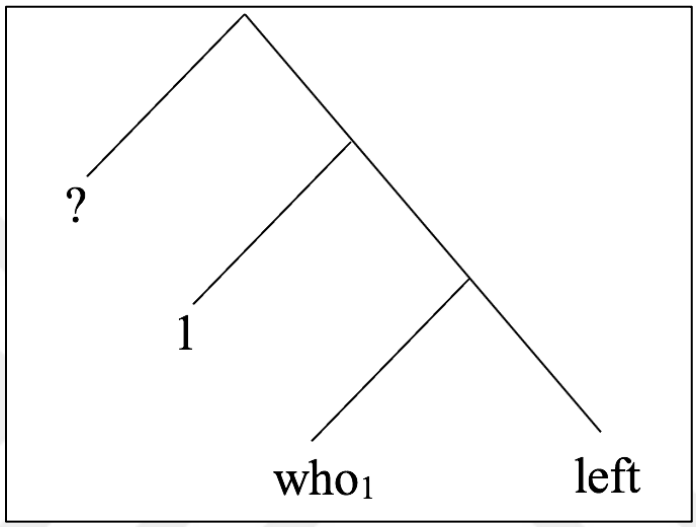



Figure 2. Rullman and Beck (1998) question LF

(11) For any world w, and any assignment function g,

$[\![\textit{Who}_1 \textit{ left } 1 \textit{ ?}]\!]^{w,g}$

$[\![\textit{who}_1]\!]^{w,g} = [\![\textit{which person}]\!]^{w,g}$ is defined iff g(1) is a person, if defined then, $[\![\textit{who}_1]\!]^{w,g} = g(1)$

$[\![\textit{left}]\!]^{w,g}([\![\text{who}_1]\!]^{w,g})$ is defined iff g(1) is a person in w, if defined,

$[\![\textit{left}]\!]^{w,g}([\![\text{who}_1]\!]^{w,g}) = 1$ iff g(1) left in w.

$[\![\textit{who}_1 \textit{ left } 1]\!]^{w,g[x/1]} = \lambda x$: x is a person in w. x left in w.

$[\![?]\!]^{w,g} = \lambda Q_{<s,et>}$. {p: $\exists$x. p = $\lambda$w'. Q(w')(x)}

$[\![?]\!]^{w,g}$ ($\lambda$w. $[\![\textit{who}_1 \textit{ left } 1]\!]^{w,g}$)

= {p: $\exists$x and p = $\lambda$w': x is a person in w'. x came in w'}

Notice that in (10), there is only one *wh*-phrase, therefore; as the semantic derivation in (11) shows, we use the question morpheme that is of type $<s,<e,t>>$ . Moreover, the restrictor of the *wh*-phrase ensures that each answer to the question presupposes that the individual mentioned in it is an element of the *wh*-restrictor. For instance, for (10), every answer is defined if and only if the variable is a person, otherwise it becomes undefined. That is the reason why we have a set of partial propositions as answers to this question.

## 2.4 Previous works on Turkish *wh*-questions

It is well known that Turkish *wh*-phrases do not overtly move to CP, unlike English ones. (12) and (13) respectively shows this contrast.

(12) (i) Sen parti-de kim-i gör-dü-n?
You party-LOC who-ACC see-PST-2.SG

'Who did you see at the party?'

(ii) Ben parti-de Ayşe'yi gör-dü-m.
I party-LOC Ayşe-ACC see-PST-1.SG

'I saw Ayşe at the party.'

(13) (i) Who did you see at the party?

(ii) I saw Ayşe at the party.

Although there is an agreement on the surface position of *wh*-phrases in the literature of Turkish, there are different views regarding their position at LF. While some assume that a *wh*-phrases move covertly to CP (Akar, 1990), thus generating LFs those like Kartunnen proposes, others assume that *wh*-phrases are interpreted in their base position like I do.

Among the latter are Arslan (1999) and Görgülü (2006). The former proposal, though mainly syntactic, come close to the view I adopt in this thesis, that is R&B's.

Building on Aoun and Li's (1993) analysis of *wh*-questions in Mandarin Chinese and Cole and Hermon (1994), Arslan (1999) suggests that although *wh*-phrases don't move to [Spec, CP] position at LF, they take matrix scope by being coindexed with a question morpheme. For instance, she proposes the following LF in (15) for a constituent question as in (14).

(14) Sen-in ne al-dığ-ını san-ıyor?
You-GEN what buy-NMLZ-POSS think-PRG

'What$_1$ does (s/)he think that you bought $t_1$?'

(15) [$CP_2$ $Qu_i$ [$IP_2$ [$CP_1$ [$IP_1$ you what$_i$ bought]] think]]

It should be noted that regardless to the similarity to R&B's LFs, there is an important difference between the two views. According to R&B, *wh*-phrases have a denotation of type *e*, therefore they are not scope taking expressions.

## 2.5 Mid summary

Up to this point, I illustrated my main assumptions relative to intensionality and the syntax/semantic of constituent questions and mentioned previous proposals on the syntax of the latter, which support my assumptions. In the sequel, I will introduce the components of Kratzer's (1986) semantics of conditionals that I will assume in my analysis of *wh*-conditionals in Chapter 3.

## 2.6 Kratzer (1986) conditional analysis

One of the most prominent views on conditionals is Kratzer (1986). The main assumption of Kratzer is that *if*-clauses function semantically as restrictors of modals. Since under this view all conditionals are considered to involve modality, in

order to properly understand it, let us first turn to simple modal sentences in Kratzer terms[9].

Kratzer (1977, 1981, 1991)[10] analysis of modals involves the following ingredients: a modal force and a flavor[11]. The modal force is the quantification force (universal or existential) of the modal, and it is encoded in the lexical entry of each modal. While necessity modals (e.g., *must, have to, it is necessary* etc.) are analyzed as universal determiners over possible worlds, possibility modals (e.g., *might, can, allow* etc.) are analyzed as existential ones. The second ingredient is the flavor of the modal and this is contextually determined. Although there are different kinds of flavors, three of them are as follows in (16).

(16) (i) Epistemic Flavor: compatible with what you know
(ii) Deontic Flavor: compatible with what the rules are
(ii) Circumstantial: compatible with the laws of nature
(Adapted from von Fintel & Heim, 2011, p.34)

To implement this idea in compositional terms, Kratzer assumes a covert modal base at LF. Specifically, Kratzer proposes that a modal base restricts the modal determiners. According to this view, a modal base consists of a pronominal which is later assigned an accessibility relation by the context of utterance and w* which always maps to the world of evaluation.[12] In the possible world semantics, accessibility relations are relations between worlds that enable us to have worlds that

[9] Note that as in von Fintel and Heim (2011), syntactically, I assume that modals in these types of sentences are raising. For a more detailed analysis see von Fintel and Heim (2011) Chapter 7 where *de re* and *de dicto* readings are discussed in the context of modal sentences.
[10] Here, I use von Fintel and Heim (2011)'s possible world semantics to explain Kratzer's analysis of modals.
[11] Note that there is also an ordering source in the original proposal of Kratzer. However, I don't use the ordering source in this thesis, therefore I don't go into details of it. See von Fintel and Heim (2011) and Kratzer (1977, 1981, 1991) for details.
[12] Here I use von Fintel and Heim (2011) technical variant for the modal base. See von Fintel and Heim (2011, p.40) for details.

are accessible from one another. (17) is the lexical entry that I use for accessibility relations.

(17) For any w and g,

$[\![R_{7<s,st>}]\!]^{w,g}$ = g(7) = λw'. λw''. w'' is epistemically / deontically / circumstantially accessible from w'.

(Adapted from von Fintel & Heim, 2011)

As (17) shows, accessibility relations are functions from worlds to propositions. Moreover, *R* with an index 7 in (17) is like a pronoun, therefore it is possible to interpret it only by relativizing it to an assignment function. Also, notice that the flavor is encoded in the accessibility relation in this view. Since accessibility relations are assigned by contexts, as the context changes, the flavor in them can change. To obtain a modal base, there is one more step, though, which is applying this accessibility relation to w*, which is a specific symbol that always maps to the world of evaluation, as shown in (18).

(18) For any w and g, and assuming that the flavor is epistemic

$[\![R_{7<s,st>}]\!]^{w,g}$ ($[\![w^*]\!]^{w,g}$) = λw'. w' is epistemically accessible from w.

(18) is a set of propositions and it corresponds to the modal base. Therefore, according to this view, we obtain the modal base by applying a contextually salient accessibility relation to the world of evaluation, w*. Also, applying the accessibility relation to w* provides the contingency. In other words, by doing this, we relativize the set of possible worlds to the world of evaluation.

Having described the modal base, the next step is to show its contribution to the meaning of modal determiners. We have the following two lexical entries in (19) and (20), respectively for a universal modal like *must* and an existential modal like *might*.

(19) Universal: $[\![\text{must}]\!]^{w,g} = \lambda p_{<s,t>}. \lambda q_{<s,t>}. \forall w'$ s.t. if $p(w') = 1$ then $q(w') = 1$

(20) Existential: $[\![\text{might}]\!]^{w,g} = \lambda p_{<s,t>}. \lambda q_{<s,t>}. \exists w'$ s.t. $p(w')$ and $q(w') = 1$

As (19) and (20) shows, modals are functions that take two propositions as their arguments and return a truth value. Their first argument is the modal base, which I described above, and the second argument is the sentence itself, which is the prejacent. Given this, a sentence involving a modal as in (21) has the following LF in Figure 3.

(21) John might come home.

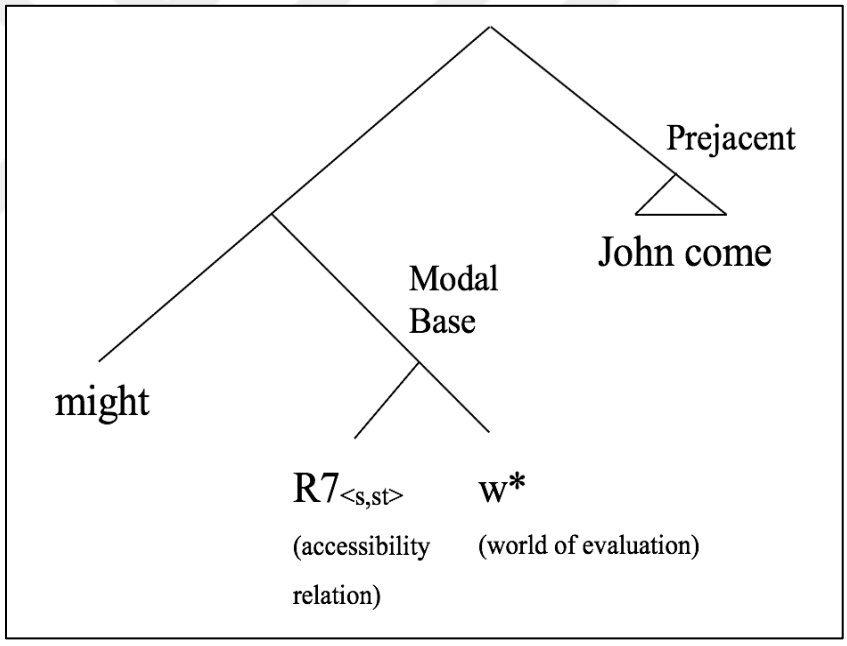



Figure 3. Kratzer (1991) modal sentence LF

Figure 3 illustrates the LF of (21). Accordingly, first the meaning of the modal, *might* in this case, combines with the result of applying the contextually salient accessibility relation to the world of evaluation, the modal base, as in (22).

(22) For any world w, and any assignment function g, for illustration purposes I assume an epistemic flavor.

$[\![might]\!]^{w,g}([\![R_{7<s,st>}\ w^*]\!]^{w,g})$

$[\![R_{7<s,st>}\ w^*]\!]^{w,g}$ =

$[\![R_7]\!]^g$ = g(7) = λw'. λw''. w'' is epistemically accessible from w'.

[λw'. λw''. w'' is epistemically accessible from w'](w*)

= λw'. w' is epistemically accessible from w.

$[\lambda p_{<s,t>}.\ \lambda q_{<s,t>}.\ \exists$w' s.t. p(w') and q(w') = 1](λw'. w' is epistemically accessible from w)

$= \lambda q_{<s,t>}.\ \exists$w' s.t. w' is epistemically accessible from w and q(w')

Now that we have a quantifier above worlds, the next step is to apply it to the intension of the prejacent sentence as shown in (23).

(23) $[\![$*John come home*$]\!]^{w,g}$ = 1 iff John come home in w.

$[\![might\ R_7\ w^*]\!]^{w,g}$ (λw'. $[\![$*John come home*$]\!]^{w',g}$) = 1 iff

$[\lambda q_{<s,t>}.\ \exists$w' s.t. w' is epistemically accessible from w and q(w')]

(λw''. John come home in w'') = 1 iff

= ∃w' s.t. w' is epistemically accessible from w and John comes home in w'

Remember that, in possible world semantics of von Fintel and Heim (2001), we work with extensions until we meet an intensional operator. Therefore, we first obtain the truth value of the sentence *John comes home* with regular function application. Then, with an Intensional Function Application, we intensionalize it and it becomes an eligible argument for this quantifier. As a result, we obtain its truth condition.

Returning now to conditionals in Kratzer (1986) terms, since they include an overt proposition contributing to restrictor of the modal, the picture presented in

Figure 3 needs to be amended accordingly. A conditional sentence as in (24) has the following LF in Figure 4 according to this view.

(24) [antecedent If John comes home], [main clause Mary might be happy].

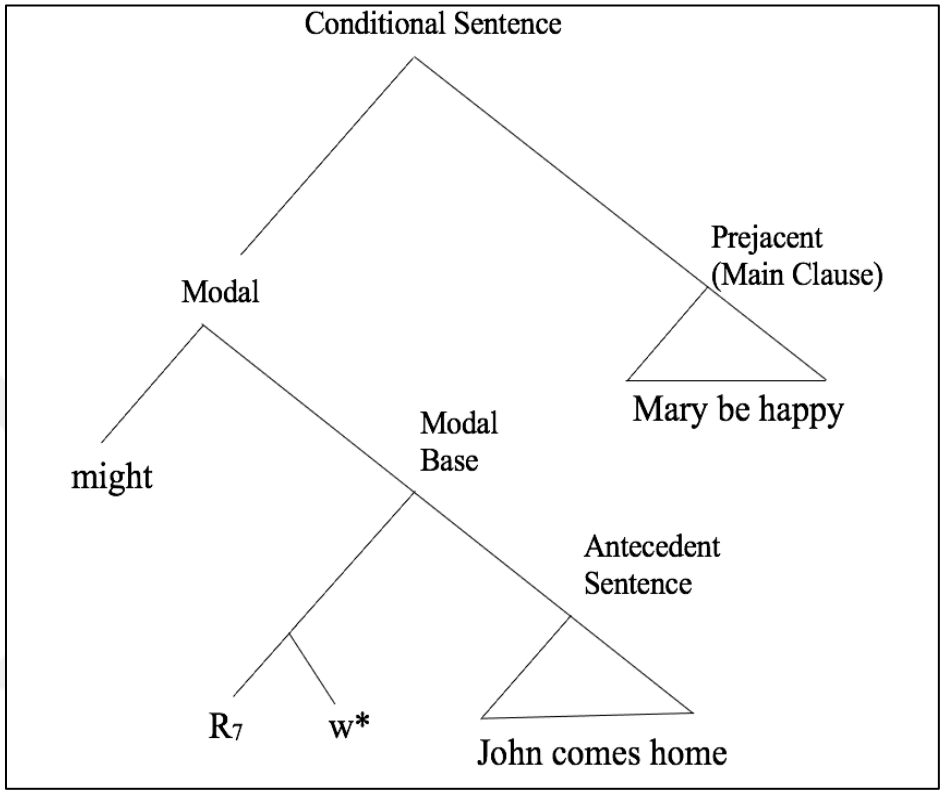



Figure 4. Kratzer (1986) indicative conditional LF

As Figure 4 illustrates, the antecedent of the conditional, *if*-clause, function as a restrictive modifier of the modal base, therefore; it needs to combine with it via Predicate Modification Rule (Heim & Kratzer, 1998). However, since the result of applying the accessibility relation to the world of evaluation is a set of propositions and we obtain the truth condition of the antecedent sentence by extensions, we cannot apply the regular Predicate Modification Rule in this case. What we need is the following Intensional Predicate Modification rule in (25).

(25) Intensional Predicate Modification Rule (IPM) (von Fintel & Heim, 2011, p.103 footnote)

If α has daughters β and γ s.t. for any w and g, $[\![\beta]\!]^{w,g}$ is of type <*s,t*> and $[\![\gamma]\!]_{\epsilon}^{g}$ is of type <*s,t*> then $[\![\alpha]\!]^{w,g} = \lambda w'. [\![\beta]\!]^{w,g}(w') = [\![\gamma]\!]_{\epsilon}^{g}(w') = 1$

Accordingly, we apply this rule to the antecedent clause and the modal base as shown in (26).

(26) Modal Base Combination with Antecedent

For any w and g, assuming an epistemic accessibility relation,

$[\![\textit{John comes home}]\!]^{w,g}$ = 1 iff John comes home in w.

$[\![R_{7<s,st>}\ w^*]\!]^{w,g} = \lambda w'.$ w' is epistemically accessible from w.

$\lambda w''$ [$\lambda w'.$ w' is epistemically accessible from w]($w''$) = [$\lambda w'''.$ John comes home in $w'''$]($w''$) = 1 (by IPM)

= $\lambda w'.$ w' is epistemically accessible from w and John comes home in w'

As a result of the semantic derivation in (26), we obtain a set of possible worlds where *John comes home* in those worlds. The remainder steps are the same as the modal sentences. As shown in (27), the modal determiner first applies to the modal base that has been modified by the antecedent clause via function application. As a result, we obtain a quantifier over worlds which later applies to the prejacent sentence by IFA. As a consequence, we obtain a truth condition.

(27) $[\![\textit{might}]\!]^{w,g}([\![R_7\ w^*\ \textit{John comes home}]\!]^{w,g})$

= ∃w' s.t. w' is epistemically accessible from w and John comes home in w'

$[\![\textit{might}\ R_7\ w^*\ \textit{John comes home}]\!]^{w,g}(\lambda w'\ [\![\textit{Mary be happy}]\!]^{w',g})$ = 1 iff

= ∃w' s.t. w' is epistemically accessible from w and John comes home in w' and Mary is happy in w'.

Summing up, according to Kratzer's conditional analysis, the only difference between modals and conditionals is the existence of a further restrictor, the antecedent clause, in the latter one. Apart from that difference, they have a similar structure and semantic operations. Therefore, in this sense, Kratzer's analysis of modals and conditionals have parallelism.

## 2.7 Conclusion

In this chapter, I summarized the theories and the technical apparatus that I assume in my proposal on Turkish *wh*-conditionals, namely, von Fintel and Heim's (2011) view on intensional semantics (in Section 2.2), Rullman and Beck's (1998) semantics of *wh*-questions (in Section 2.3), previous works on Turkish *wh*-questions (in Section 2.4) and, lastly, Kratzer's (1986) semantics of conditionals (in Section 2.6).

In the next chapter, I present my proposal on the semantics of *wh*-conditionals in Turkish and compare it with previous accounts.

# CHAPTER 3

# AN ANALYSIS OF *WH*-CONDITIONALS IN TURKISH

## 3.1 Introduction

Having introduced the theoretical background for my analysis, in this chapter, I propose a compositional analysis of conditionals with *wh*-phrases in their antecedents (*wh*-conditionals).

As I mentioned in Chapter 1, Turkish, *wh*-conditionals are ambiguous between question and free conditional readings as shown in (1).

(1) [$_{\text{antecedent}}$ Kim vazoyu kır-sa] [$_{\text{main clause}}$ (o) ceza
who vase-ACC break-sA pro punishment
al-ır. /?][13]
take-AOR

(i) Free Conditional (FC) Reading: 'Whoever breaks the vase gets punished.'

(ii) Question Reading: 'Who$_1$ is such that if $t_1$ breaks the vase, (s/)he$_1$ gets punished?'

As stated in Chapter 1[14], the question reading in (1) is predictable and unproblematic since argument *wh*-phrases like *kim* ('who') and *ne* ('what') in Turkish exhibit island insensitive behaviors (Arslan, 1999; Görgülü, 2006; Demirok, 2019). The more challenging part is to derive the meaning of the free conditional reading compositionally and this is the main goal of this chapter.

[13] Note that *-sA* is treated as marker of subjunctive conditionals in Turkish (e.g.: Kuruoğlu, 1986). Moreover, I don't go into deictic and contingent readings which I will return in the following parts.
[14] See Chapter 1 for details about island insensitivity.

In this chapter, I will first summarize and discuss the only existing semantic analysis of Turkish free conditionals, Demirok (2017), as well as Rawlins's (2013) unconditional theory which Demirok (2017) builds on. I will argue that this proposal runs into a problem of overgeneration. I will then propose a novel compositional analysis building on Rullman and Beck's (1998) question semantics and evaluate its advantages and disadvantages in comparison with Demirok's (2017). While analyzing those types of sentences, I ignore different types of conditionals since it is outside the scope of this thesis.

## 3.2 Rawlins (2013): Unconditionals

Rawlins (2013) studies the relation between conditional sentences as in (2), and unconditional sentences, as in (3), in English.[15]

(2) Conditional: [$_{\text{antecedent}}$ If John comes to the picnic,] [$_{\text{main clause}}$ I will be happy.]

(3) Unconditional: [$_{\text{antecedent}}$ Whoever comes to the picnic,] [$_{\text{main clause}}$ I will be happy.]

According to Rawlins (2013), both (2) and (3) are variants of conditionals, since in both cases, the adjuncts enable a restriction to the operators in their scope (Kratzer, 1986). However, while in regular conditional sentences like (2), the only overt restrictor for the modal *will* is the proposition *John comes to the party*, in unconditionals, a set of alternative propositions restrict the modal, *will*, due to the presence of the *wh*-phrase and the question semantics it triggers. Figure 5 and Figure

[15] For the analysis of different kinds of unconditionals like alternative unconditionals as in (1) see Rawlins (2013). In parallel with *wh*- unconditionals, which he calls constitutent unconditionals, he proposes a parallel analysis based on Hamblin (1973) alternatives.

(1) Whether John comes or not, Mary doesn't care.

6 below, illustrate this difference in the restriction between conditionals and unconditionals respectively (Adapted from Rawlins, 2013, p. 120).

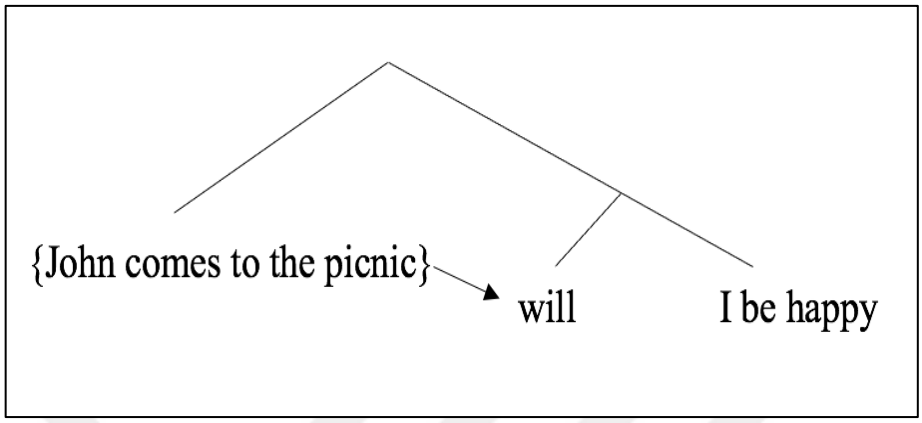



Figure 5. Rawlins (2013) conditional LF

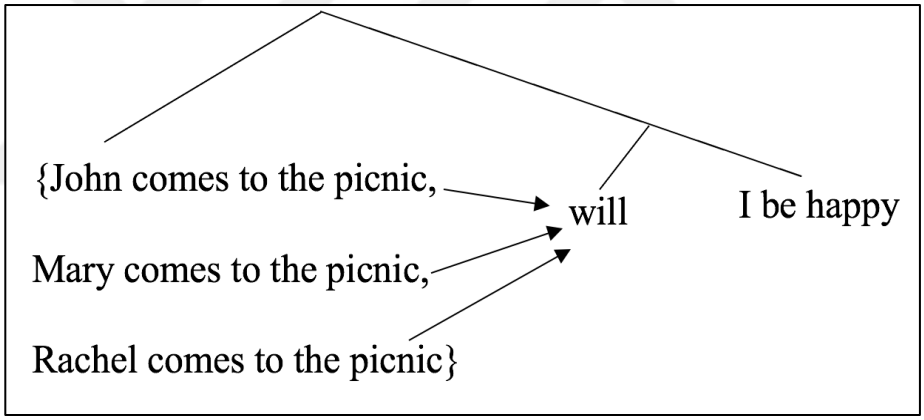



Figure 6. Rawlins (2013) unconditional LF

Rawlins's (2013) proposal is that unconditionals in English involve Hamblin (1973) question semantics and Kratzer's (1986) conditional analysis. Following Hamblin, Rawlins (2013) suggests that the *wh*-phrase in (3) triggers the formation of alternatives that expand to the entire conditional by the semantic process of pointwise/set tolerant function application (PFA henceforth). Given this, before introducing Rawlins's (2013) analysis, I briefly illustrate Hamblin's (1973) semantics of questions.

According to Hamblin (1973), the meaning of a question is defined as a set of propositions that are possible answers to the question and these alternative answers are achieved through the meaning of *wh*-phrases, which are taken to denote sets of alternatives. For instance, a *wh*-phrase such as *who* has the following denotation in (4).

(4) $[\![who]\!]^{¢} = \{\lambda w.\ x: x \in D_e\}$

As (4) shows, Hamblin's intension of *who* is the set of all individual concepts. These sets then combine compositionally with the meanings of their sister constituents to form sets of intentions of larger expressions via the following semantic rules in (5).

(5) Set Tolerant (Pointwise) Function Application (von Fintel & Heim, 2001,p. 14).

If $\alpha$ is a branching node and $\{\beta, \gamma\}$ is the set of its daughters then,

(i) $[\![\alpha]\!]^{¢} = \lambda w.\ [\![\beta]\!]^{¢}(w)([\![\gamma]\!]^{¢}(w))$

(ii) or $= \{\lambda w.\ [\![\beta]\!]^{¢}(w)(x(w)): x \in [\![\gamma]\!]^{¢}\}$

(iii) or $= \{\lambda w.\ f(w)([\![\gamma]\!]^{¢}(w)): f \in [\![\beta]\!]^{¢}\}$

(iv) or $= \{\lambda w.\ F(w)(x(w)): f \in [\![\beta]\!]^{¢}\ \&\ x \in [\![\gamma]\!]^{¢}\}$

whichever is defined

Depending on the types of the intensions involved at each compositional step, different kinds of pointwise function applications can take place. For instance, for a sentence as in (6), we have the following sets of operations in (7).

(6) Who did Mary meet?

(7) $[\![who]\!]^{¢} = \{\lambda w.\ x: x \in D_e\}$

$[\![met]\!]^{¢} = \lambda w.\ \lambda x.\ \lambda y.$ x met y in w.

$[\![met\ who]\!]^{¢}$

$= \{\lambda w.\ [\![met]\!]^{¢}(w)z(w): z \in [\![who]\!]^{¢}\}$ (by PFA ii)

= {λw. λy. y met x in w: x ∈ $D_e$}

⟦*Mary met who*⟧¢

= {λw. f(w)(⟦*Mary*⟧¢(w)): f ∈ ⟦*met who*⟧¢} (by PFA iii)

= {λw. Mary met x in w: x ∈ $D_e$}

The operations in (7) illustrate the way of obtaining question meaning in Hamblin system. Also, notice that similar to the analysis of R&B (1998) and differing from Kartunnen (1976), in this view, we can obtain the question meaning, a set of propositions, without moving *wh*-phrases to C position at LF.

Given this, Rawlins's (2013) proposal is to analyze *wh*-ever phrases as Hamblin *wh*-phrases and obtain sets of conditional sentences via PFA rules. For instance, according to him, *whoever* is equal to *who* above, so a sentence as in (8), repeated from (3), would be interpreted via the following steps.[16].

(8) Whoever comes to picnic, I will be happy.

First, we generate a set of alternative conditionals via PFA due to the semantics of *whoever* as shown in (9).

(9) For any world w and any assignment function g,

Considering *will* as a universal modal, equal to *must*.

⟦*whoever*⟧¢ = {λw. x: x ∈ $D_e$}

⟦*whoever comes to picnic*⟧¢ = {λw. x comes to the picnic in w: x ∈ $D_e$}

The next step is to combine the modal determiner with the set of alternatives we generated in (9) by PFA as follows in (10).

(10) ⟦*must whoever come to picnic*⟧¢

[16] For illustration purposes, I ignore the restrictor of the conditional and the ordering source in the operations, see Rawlins, 2013 for details.

= {λw. ⟦*must*⟧¢(w)(p)(w): p ∈ (⟦*whoever comes to the picnic*⟧¢(w))}

= {λw. λq. ∀w s.t. x comes to the picnic in w then q(w): x∈ $D_e$}

The last step is to combine the result of (10), a function from worlds to a set of propositions, with the prejacent sentence in (8) as shown in (11).

(11) ⟦*must whoever come to picnic, I be happy*⟧¢

={λw. f(w)(⟦*I be happy*⟧¢(w)): f ∈ ⟦*must whoever comes to the picnic*⟧¢}

= {λw. ∀w s.t. x comes to the picnic in w then I be happy: x∈ $D_e$}

The set of propositions obtained as a result of semantic derivation in (11) can be exemplified as follows in (12).

(12) {If John comes to the picnic in w, I will be happy in w,
If Mary comes to the picnic in w, I will be happy in w,
If Rachel comes to the picnic in w, I will be happy in w…}

Notice that this corresponds to the denotation of the question *Who is the person x such that x comes to the picnic then I will be happy?.* However, unconditionals are statements. In order to obtain a declarative interpretation from this set of propositions, with the desired truth conditions, Rawlins (2013) postulates the presence of universal assertion operator (Op∀) with the following lexical entry in (13).

(13) The rendition of the lexical entry by Demirok (2017, p. 163).

Op∀ = $\lambda p_{<st,t>}$. λw. ∀p [P(p) → p(w)]

Op∀ combines with a set of propositions and generates a generalized conjunction out of it, that is the conjunction of all the propositions in the set. The resulting assertion is the one in (14).

(14) If John comes to the picnic, I will be happy and if Mary comes to the picnic, I will be happy and if Rachel comes to the picnic, I will be happy, …

'For every individual x, if x came to the party, I will be happy'

### 3.3 Demirok (2017): Free conditionals as unconditionals

As mentioned above, the only previous compositional analysis of *wh*-conditionals in Turkish is Demirok (2017)[17]. Demirok's proposal is essentially an extension of Rawlins's (2013) analysis of unconditionals to what I refer to as free conditional readings in (15).

(15) Kim vazo-yu kır-sa o ceza al-ır./?
Who vase-ACC break-sA pro punishment take-AOR

(i) Contingent Free Conditional (CFC) Reading: 'Whoever breaks the vase gets punished.'

(ii) Deictic Free Conditional (DFC) Reading: 'Whoever breaks the vase, he (e.g.: Bill) gets punished.'

(iii) Contingent Question (CQ) Reading: 'Who$_1$ is such that if t$_1$ breaks the vase, (s/)he$_1$ gets punished?'

(iv) Deictic Question (D.Q) Reading: 'Who$_1$ is such that if t$_1$ breaks the vase, he$_2$ (e.g: Bill) gets punished?'

Following Rawlins (2013), Demirok (2017) attributes to the *wh*-phrase in (15) a Hamblin-type of denotation. As a consequence, a set of alternative conditionals is generated, and a silent universal assert operator needs to be stipulated in order to

[17] Note that Demirok (2017) refers to free conditional readings, contingent and deictic, respectively as correlative and unconditional. He also treats -sA as a correlative marker in the spirit of Iatridou (2013). To avoid any misunderstanding, I use my own terminology for the rest of this thesis.

obtain the declarative (FC) interpretation. In addition to this, in order to obtain what I labeled as the contingent interpretation of this sentence, he suggests that the pronoun in the consequent is an E-type pronoun (Evans, 1980; Heim,1990). Specifically, *o* in (15) receives the interpretation 'the person / the maximal individual who breaks the vase'. Since this is an analysis that I adopt as well for CFC readings, I will return to E-type pronouns later and explain in more details how this interpretation is obtained. In the remainder of this chapter, I will instead focus on the aspects of Demirok's analysis which I will depart from.

As for the compositional analysis, Demirok follows Rawlins's analysis and treats *wh*-phrases as Hamblin alternatives (see(16)). Therefore, firstly the question like denotation in (16) is obtained as the denotation of $CP_2$ in Figure 7, which is the LF that he proposes for CFC reading of (15), via pointwise function application.

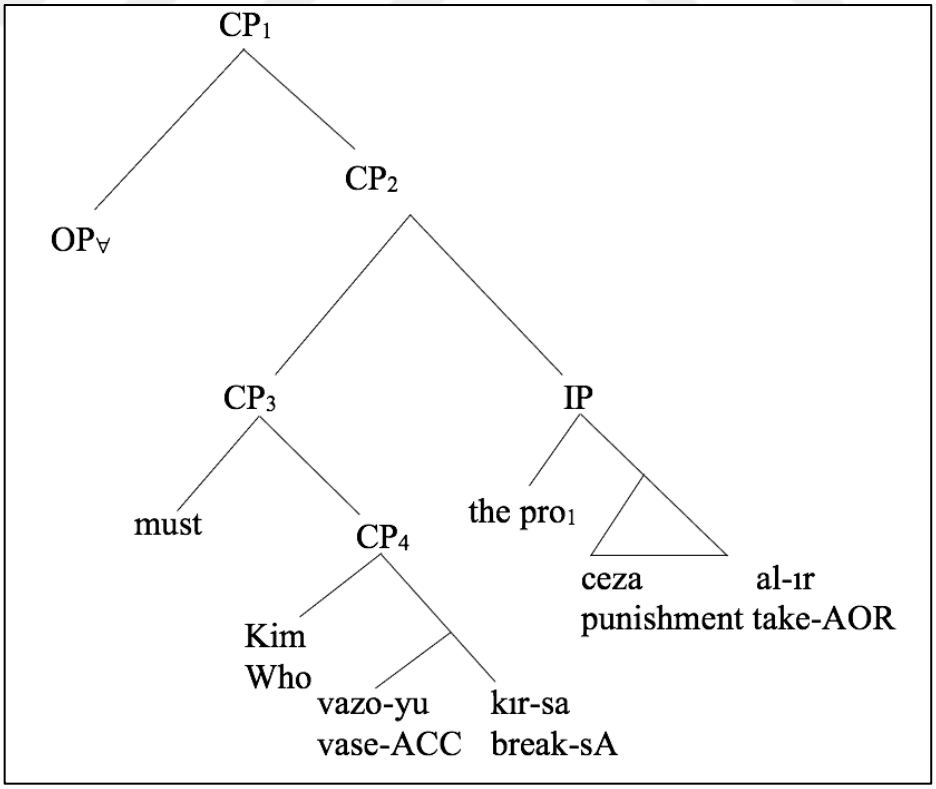



Figure 7. Demirok (2017) contingent FC reading LF

(16) (i) $[\![kim]\!]^{\not c} = \{\lambda w.\ x: x \in D_e\}$

(ii) $[\![must\ Kim\ vazoyu\ kırsa\ the\ pro_1 ceza\ alır]\!]^{\not c} = \{\lambda w.\ \forall w$ s.t. x breaks the vase in w and the maximal individual that breaks the vase in w gets punished in w: $x \in D_e\}$

This set (16) may be illustrated as in (17).

(17) {If John breaks the vase, the maximal individual that breaks the vase must get punished, if Mary breaks the vase, the maximal individual that breaks the vase must get punished…}

As Figure 7 illustrates, in the next step, $CP_1$, the same universal assert operator as in Rawlins (see (18)), applies to this set of propositions. (19) is the result of this application.

(18) $Op\forall = \lambda p_{<st,t>}.\ \lambda w.\ \forall p\ [P(p) \rightarrow p(w)]$

(Demirok, 2017, p. 163)

(19) If John breaks the vase, the maximum individual that breaks the vase must get punished and if Mary breaks the vase the maximum individual that breaks the vase must get punished…

The assert operator applies to the set of propositions in (17) and gives the big conjunction of all propositions inside that set. In other words, it asserts that all conditional statements are true.[18]

Noticeably, Demirok (2017) doesn't discuss the interrogative readings (iii and iv) in (15) repeated below as (20), however his analysis can easily predict them, since the two readings are automatically obtained by excluding the assert operator ($OP_{\forall}$) from the LF structure discussed above (see Figure 7). Given this, the LF of the

[18] As for deictic readings, I don't derive them here since they are interpreted exactly in the same way except that the pronoun in their consequent receives a deictic pronoun, rather than an E-type.

contingent question reading (see Figure 8), is identical to $CP_2$ in Figure 7 above and its denotation is the set of alternatives in (17), repeated below in (21).

(20) Kim vazo-yu kır-sa o ceza al-ır.
Who vase-ACC break-sA pro punishment take-AOR.

(i) CFC: 'Whoever breaks the vase gets punished.'

(ii) DFC: 'Whoever breaks the vase, (s/)$he_2$ gets punished.'

(iii) CQ: '$Who_1$ is such that if $t_1$ breaks the vase (s/)$he_1$ gets punished?'

(iv) FQ: '$Who_1$ is such that if $t_1$ breaks the vase (s/)$he_2$ gets punished?'

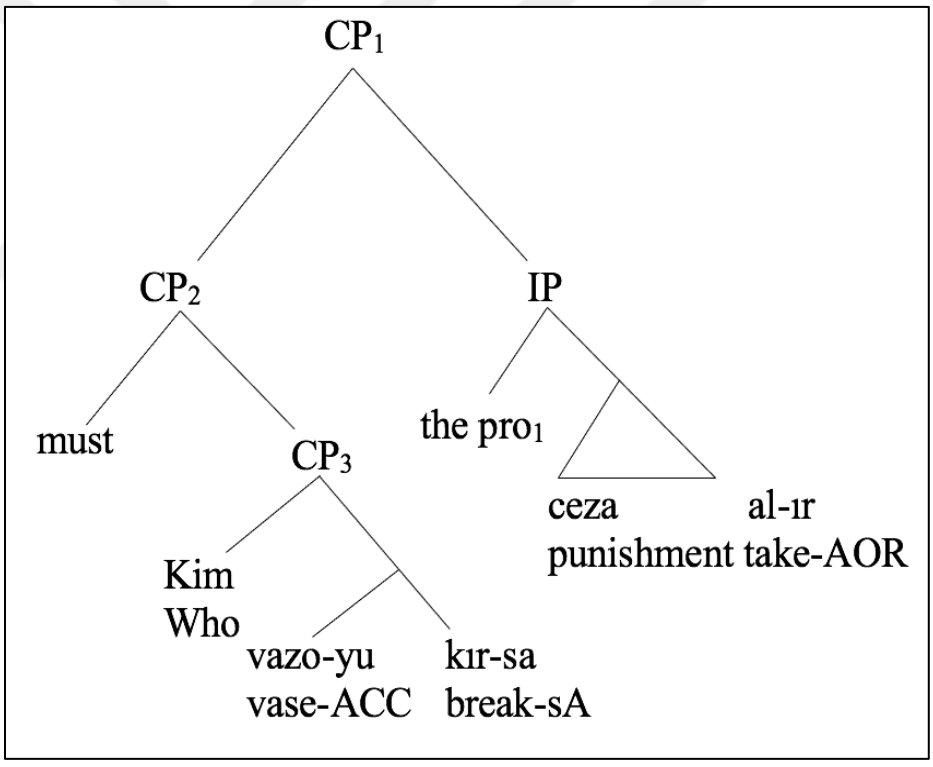



Figure 8. Demirok (2017) contingent question reading LF

The LF in Figure 8 has a denotation paraphrasable as in (21).

(21) {If John breaks the vase, the maximal individual that breaks the vase must get punished, if Mary breaks the vase, the maximal individual that breaks the vase must get punished…}

Noticeably, like in the contingent free conditional interpretation above, (19), (21) is also obtained by an E-type interpretation of the pronoun in the consequent[19]. My analysis will depart from this for the question reading but I will also maintain E-type analysis for CFC reading.

Given this, now I return to the compositional details of E-type pronouns. Heim (1990) offers E-type pronouns as a solution to sentences as in (22) including a pronoun, *it*, that co-varies with a non c-commanding NP, *a cat*.

(22) Every woman who has a cat pets it.

Within its natural meaning, we can rephrase (22) as follows in (23).

(23) Every woman who has a cat pets the cat that she has.

When this paraphrase is considered, for every woman x there is possibly a different cat y such that x pets y. However, at LF, as shown in (24), *a cat* doesn't c-command the pronoun *it*.

(24) [Every woman $_{RC}$[who has a cat] pets it]

To obtain the co-varying reading of the pronoun *it* in (22), Heim (1990) proposes the following LF in Figure 9 (Heim & Kratzer, 1998, p. 292).

[19] This assumption is not strictly necessary insofar as a pronoun binding mechanism can be defined whithin Hamblin semantics. This however is not a simple issue and it is still subject to debate (see Ciardelli, Roelofsen &Theiler 2017 for a discussion)

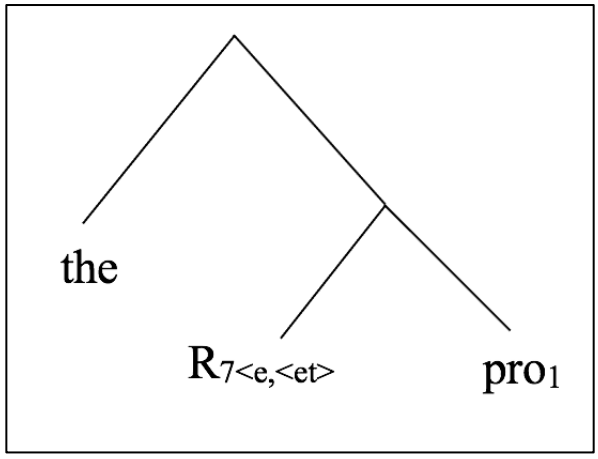



Figure 9. Heim and Kratzer (1998) E-type pronoun

In Figure 9, *pro* with index 1 is an individual of type *e* bound by every woman. *R*, with the index 7 is a pronominal and obtains its value by an assignment function that is determined by the linguistic context, the context being the sentence itself in this case. Therefore, it has the following value in (25).

(25) $[\![R_7]\!]^{w,g} = g_7 = [7 \rightarrow \lambda x.\ \lambda y.$ y is a cat that x has]

To obtain an E-type pronoun interpretation, the next step is to apply (25) to $pro_1$ and then combine it with the determiner *the*. (26) illustrates this derivation.

(26) For any w and g,

(i) $[\![R_7]\!]^{w,g}(pro_1)^g = \lambda y.$ y is a cat that she has.

(ii) $[\![the]\!]^{w,g}([\![R_7\ pro_1]\!]^{w,g})$ = the unique x in w s.t. x is a cat that she has

which can be rephrased as

(iii) The unique cat that she has

As a consequence, the pronoun *it* in (22) obtains the interpretation in (26), which ensures that for different women, there are possibly different cats.

Returning to Demirok (2017), we have a similar issue in contingent reading of FCs as well as questions like (27) as shown by the sketchy LFs in (28).

(27) Kim vazo-yu kır-sa o ceza al-ır./?
Who vase-ACC break-sA (s/)he punishment take-AOR

(i) CFC: 'Whoever breaks the vase, gets punished.'

(ii) CQ: 'Who$_1$ is s.t. if (s/)he$_1$ breaks the vase, (s/)he$_2$ gets punished?'

(28) (i) LF of CFC: [OP∀[must who break vase] (s/)he$_2$ gets punished.]

(ii) LF of CQ: [[must who break vase] (s/)he$_1$ gets punished?]

For readings in (27), the desired truth conditions are such that the pronoun *o* co-varies with variable x denoted by *who*. As (28) shows, since regular binding is not possible, Demirok maintains an E-type analysis for the pronoun in the main clause (see Hirsch, 2016 for a similar account). Figure 10 is an illustration of LF of the pronoun *o* in the main clause of (27) and (29) shows its derivation.

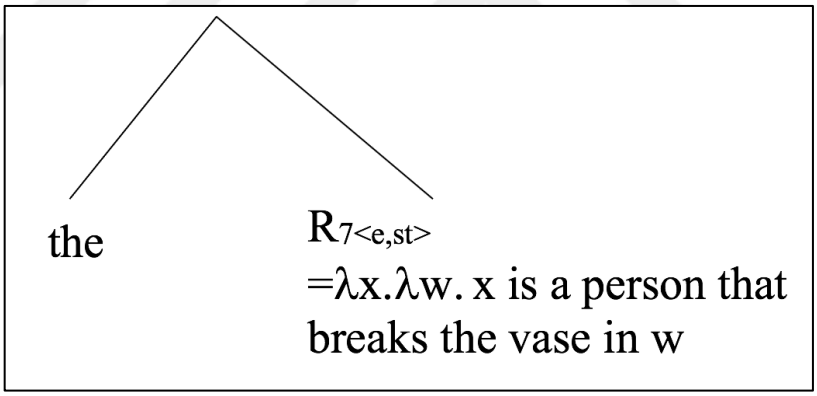



Figure 10. Demirok (2017) E-type analysis

(29) the [λx. λw. x is a person that breaks the vase in w] = the maximal individual that breaks the vase in w.

Differing from Heim, in the analysis of Demirok, *pro* in Figure 10 that resolves from the linguistic context is world dependent[20]. Therefore, it is possible to have different

[20] Note that in the original paper, Demirok uses situation semantics, therefore he assumes that the pronoun varies from situations to situations. This is because, for E-type analysis to work properly, we need to assume that we quantify over minimal situations. However, in this thesis, I use a simplified version of E-type analysis based on world semantics.

individuals in different worlds. In other words, as the worlds vary, 'the maximal individual that breaks the vase' co-varies with them.[21]

### 3.4 Discussion

Demirok's view correctly derives the TCs of *wh*-conditionals and the distinction between their deictic and contingent interpretations, but this comes with a cost. Specifically, the stipulation of an assert operator (Op∀), which Demirok (2017) borrows from Rawlins (2013), results in overgeneration predictions for Turkish. Once the availability of such an operator over sets of propositions is stipulated, an incorrect prediction is borne out: Simple questions should also receive declarative readings, which amount to the conjunction of all their possible answers as in (30).

(30) Bugün ders-e kim gel-di?
Today class-DAT who come-PST

(i) Question Meaning: {that John came to the class today, that Susan came to the class today, that Mary came to the class today…}

(ii) Declarative Meaning: Mary came to the class today and John came to the class today and Susan came to the class today…

[21] Here, differing from Heim's (1990) analysis, we assume that *the pro* is the maximal individual, not the unique individual. Although Demirok (2017) doesn't make it clear where this comes from, it is possible to derive it through using the operator σ, as shown by Šimík (2020), following Caponigro (2003) which is a technical apparatus that is proposed for deriving the meaning of English free relatives. Basically, this operator takes a predicate and gives the maximal individual entities. For instance, according to Šimík (2020, p. 6) the following entry is proposed for the following sentence.

(1) Whatever Adam presented sounded plausible
σx thing (x) and presented (x)(Adam)
( = the maximal x such that x is a thing and Adam presented x)

So, alternatively, this operator can be used to make it clear that it is the maximal entity rather than the unique specific entity. However, since this is outside the scope of this thesis, I don't go into the details of maximality issue. I stick to the analysis of Demirok (2017) in this sense.

Contrary to Demirok's prediction, the only available reading for the sentence in (30) is the question reading.[22] This is a severe problem since there is no way to establish a semantic constraint on the universal assert operator that would prevent this prediction insofar as *wh*-conditionals are assumed to involve a constituent whose denotation is identical to a question denotation (Rawlins, 2013). This is so because a strict compositional semantics requires that each constituent fully depends in its interpretation on the denotations of its immediate sub-constituents, regardless of their internal structure. Since the assert operator can only be defined for sets of propositions independently of how they are derived, it is interpretable whether this set is generated from a question or from a free conditional. Evidently what triggers the need of this problematic stipulation resides in the assumption that *wh*-phrases generate sets of alternatives in both questions and free conditionals. This assumption is, in turn, justified by the desideratum of maintaining the same semantic contribution for *wh*-phrases in both *wh*-conditionals and questions. Given this, it might appear that there is no way to avoid overgeneration without giving up a unified analysis of *wh*-phrases.

This conclusion, however, stands only insofar as the only available analysis of in situ *wh*-constituents were Hamblin's. In the next section I will argue that in fact one can maintain the same semantics for *wh*-phrases in both *wh*-questions and *wh*-conditionals, by adopting Rullman and Beck's (1998) analysis of in situ *wh*-, according to which it is not this phrase that generates alternatives. An additional advantage of this is that in question readings, pronoun binding will be achieved without resorting to E-type analysis.

[22] Alternatively, we can solve the problem of overgeneration that results from the assert operator by assuming that the assert operator is interpreted lower in the structure, above the free conditional antecedent. However, this is only possible by assuming a higher type, for this operator (Demirok, p.c., July 2, 2021).

## 3.5 Proposal: Turkish *wh*-phrases as bound variables

I propose that Turkish free conditionals like (15) repeated here as (31) are specific sub-types of conditionals and should be analyzed by taking conditional morphology and its contributions into consideration along with the *wh*- semantics.

(31) Kim vazoyu kır-sa o ceza al-ır./?
Who vase-ACC break-sA pro punishment take-AOR

(i) Free Conditional: 'Whoever breaks the vase gets punished.'

(ii) Question: 'Who$_1$ is such that if $t_1$ breaks the vase s/he$_1$ gets punished?[23]'

This analysis adopts Kratzer's (1986) view on *if*-clauses as restrictors of modals just as Demirok's (2017). These clauses in Turkish are marked with *-sA* or *ise* which mark conditionals in Turkish (Göksel & Kerslake, 2005). The only difference between regular conditionals as in (32) and *wh*-conditionals as in (31) is the occurrence of a *wh*- constituent in the antecedent of the latter one.

(32) Ali vazo-yu kır-sa (o) ceza al-ır.
Ali vase-ACC break-sA he punishment take-AOR

'If Ali broke the vase, he would get punished.'

I will start with applying to Turkish examples the assumptions that I laid out in Chapter 2 regarding each of these two ingredients (the semantics of conditional and that of *wh*-phrases) and then proceed to my analysis of Turkish *wh*-conditionals.

(33) is an example of a simple indicative conditional in Turkish.

(33) Ali gel-ir ise Ayşe mutlu ol-ur.
Ali come-AOR ise Ayşe happy be-AOR

'If Ali comes Ayşe will be happy.'

[23] Note that this also has deictic readings, however for the reasons of presentation, I ignore those readings at the moment, which I show in the end is derived with the same mechanism that I propose in this chapter.

I suggest that the LF of (33) is the one in Figure 11.

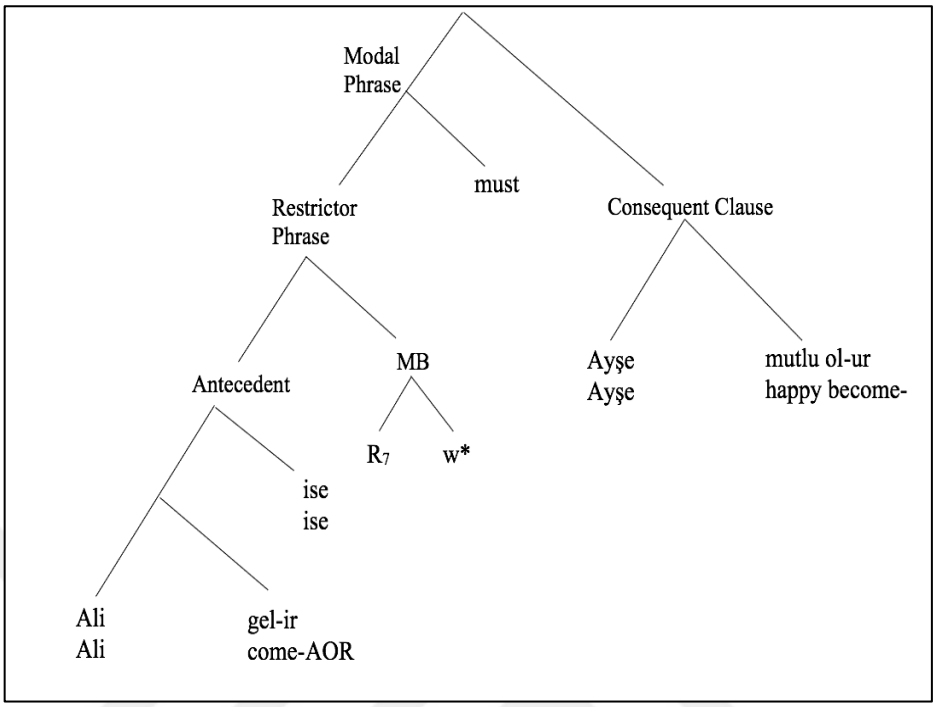



Figure 11. Turkish conditional LF based on Kratzer (1986)

The semantic derivation of (33) is as follows. The first step is to derive the modal base as shown in (34). Recall from Chapter 2 that the modal base is obtained by combining a contextually salient accessibility relation with the world of evaluation (For an illustration, I will assume that the sentence is interpreted relative to an assignment function which maps 7 to an epistemic accessibility relation). Therefore, we first combine these two ingredients.

(34) For any world w, and any assignment function g

$[\![R_7]\!]^{w,g} = g(7) = \lambda w.\ \lambda w'.$ w' is epistemically accessible from w.

$[\![w^*]\!]^{w,g} = w$

thus,

$[\![R_7\ w^*]\!]^{w,g} = [\![R_7]\!]^{w,g}(w) = \lambda w'.$ w' is epistemically accessible from w.

In the second step, the proposition denoted by the antecedent restrictively modifies this modal base resulting in the restrictor of the modal (see (35)).

(35) For every w and g,

$[\![$*Ali gelir ise w* R7*$]\!]^{w,g}$

$[\![$*Ali gelir ise*$]\!]^{¢}$ = λw'. Ali comes in w'.

λw'. $[\![$*Ali gelir ise*$]\!]^{¢}$(w') = 1 and $[\![R_7\ w^*]\!]^{w,g}$(w') = 1 (by IPM)

= λw'. w' is epistemically accessible from w and Ali comes in w'.

Then, the modal determiner applies to this restrictor to generate a modal quantifier as follows in (36).

(36) For every w and g,

$[\![$*must*$]\!]^{w,g}$ = $\lambda q_{<s,t>}.\ \lambda p_{<s,t>}.\ \forall$w' if q(w') then p(w').

$[\![$*Ali gelir ise w* R7 must*$]\!]^{w,g}$ =

$[\![$*must*$]\!]^{w,g}$(λw'. w' is epistemically accessible from w and Ali comes in w')

= $\lambda p_{<s,t>}.\forall$w' s.t. w' is epistemically accessible from w and Ali comes in w', p(w') = 1

Lastly, the truth condition of the conditional sentence is derived by applying the modal quantifier to the proposition expressed by the consequent clause via Intensional Function Application as in (37).

(37) For every w and g,

$[\![$*Ali gelir ise w* R7 must Ayşe mutlu olur*$]\!]^{w,g}$ =

$[\![$*Ali gelir ise w* R7 must*$]\!]^{w,g}$ (λw'. Ayşe will be happy in w') = 1 iff

∀w' s.t. w' is epistemically accessible from w and Ali comes in w' then Ayşe will be happy in w'.

The second set of assumptions regards the semantics of *wh*-questions. The theory I adopt is Rullman and Beck's (1998), according to which *wh*-phrases are expressions introducing variables that are unselectively bound by a higher question operator, *?*, at LF (see Chapter 2 for details). Given this, my claim is that all *wh*-phrases in Turkish are restricted variables with the presupposition that the value of the variable is an element of the restrictor. With this reasoning in mind, I propose that Turkish *wh*-phrases have the following denotations in Table 1.

Table 1. Turkish *Wh*-phrases

| *Wh*-Phrase | LF | Denotation in the spirit of R&B (1998) |
|---|---|---|
| $[\![Kim_1]\!]^{w,g}$ ('Who') | Which person | Defined iff g(1) is a person, if defined then $[\![Kim_1]\!]^{w,g} = g(1)$. |
| $[\![Ne_1]\!]^{w,g}$ ('What') | Which thing | Defined iff g(1) is a thing, if defined then $[\![Ne_1]\!]^{w,g} = g(1)$. |
| $[\![Nere_1]\!]^{w,g}$ ('Where') | Which place | Defined iff g(1) is a place, if defined then $[\![Nere_1]\!]^{w,g} = g(1)$ |
| $[\![Hangi_1\ kız\ ]\!]^{w,g}$ ('Which girl') | Which girl | Defined iff g(1) is a girl, if defined then $[\![Hangi_1\ kız\ ]\!]^{w,g} = 1$ |
| $[\![Ne\ zaman]\!]^{w,g}$ ('What time') | Which time | Defined iff g(1) is a time, if defined then $[\![Ne\ zaman]\!]^{w,g} = g(1)$ |

Moreover, in line with R&B, I suggest the following LF in Figure 12 for a simple question in Turkish as in (38) and the interpretation of *?* is as in (39) (see Chapter 2 example 11).

(38) Kim gel-di?
Who come-PST

'Who came?'

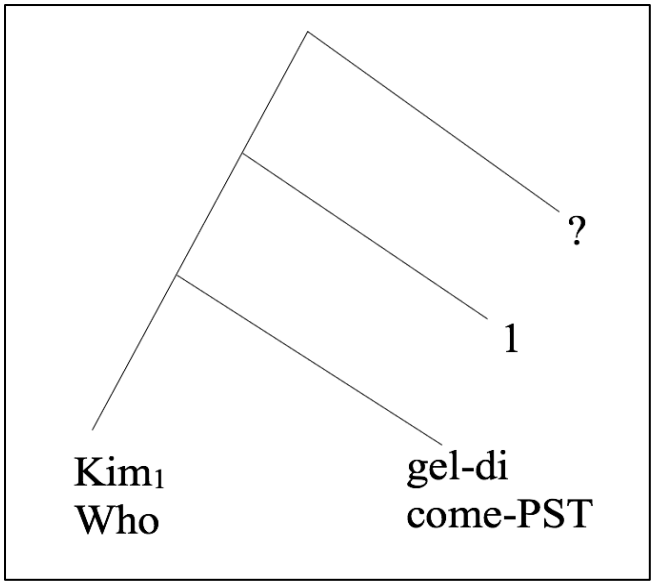



Figure 12. Turkish *wh*-question LF based on von Fintel and Heim (2001)

(39) $[\![?]\!] = \lambda Q_{<s,<e1\ldots<en,t>>>}.\ \{p: \exists x_1 \ldots \exists x_n.\ p = \lambda w'.\ \lambda Q(w')(x_1)(x_2)\ldots(x_n)\}$

Based on these assumptions, the meaning of *Kim geldi?* is derived as follows. First, we combine *kim1* with the predicate via regular function application and obtain a truth condition with an open variable as in (40).

(40) For any w and g, (ignoring the tense of the verb)

$[\![kim_1]\!]^{w,g}$ is defined iff g(1) is a person in w, if defined

$[\![kim_1]\!]^{w,g} = g(1)$

$[\![geldi]\!]^{w,g}$ ($[\![kim_1]\!]^{w,g}$) is defined iff g(1) is a person in w, if defined

$[\![geldi]\!]^{w,g}$ ($[\![kim_1]\!]^{w,g}$) = 1 iff g(1) came in w.

The next step is the predicate abstraction due to the index 1 at LF as shown in (41). As a result, we obtain a one place predicate with the presupposition that the variable is a person.

(41) For any w and g, assuming that 1 maps to x

$[\![kim\ geldi\ 1]\!]^{w,g[x/1]}$

λx: x is a person in w. x came in w.

Lastly, we apply *?* to the intension of the derived one place predicate in (41) and obtain a set of propositions (see (42)).

(42) Given,

$[\![$*kim geldi 1*$]\!]^{g}$ = λw'. λx: x is a person in w'. x came in w'

$[\![$*kim geldi 1 ?*$]\!]^{w,g}$

$= [\![?]\!]^{w,g}$ (λw'. λx: x is a person in w'. x came in w')

= {p: ∃x and p = λw': x is a person in w'. x came in w'}

Notice that as (42) shows, the result of all operations is a set of partial propositions that are defined if and only if x is a person. As a consequence, any answer to the question will presuppose that the individual mentioned in it is a person.

When it comes to the semantic derivation of question meaning, as above derivation shows, the *wh*-phrase is not the source of alternatives. This is the key point in the analysis that I will propose for *wh*-conditionals. Until we encounter the question operator in the structure, we don't have a set of propositions, but an open proposition. This is because the *wh*-phrase in essence is just a restricted variable and it is not an element that triggers the shift to the sets of denotations, susceptible to being bound by other adequate operators with a declarative effect. This will pave the way for us to attain correct readings for free conditionals without running into Demirok's (2017) overgeneration problem.

Having introduced my assumptions, I can now turn to illustrating my account of *wh*-conditionals as in (1) repeated here as (43).

(43) Kim vazo-yu kırsa o ceza al-ır. /?
Who vase-ACC break-sA pro punishment take-AOR

(i) CFC: ‘Whoever break the vase gets punished.’

(ii) DFC: ‘Whoever breaks the vase, he (e.g.: Bill) gets punished.’

(iii) CQ: ‘Who$_1$ is such that if t$_1$ breaks the vase (s/)he$_1$ gets punished?’

(iv) FQ: ‘Who$_1$ is such that if t$_1$ breaks the vase (s/)he$_2$ gets punished?’

Here are the main differences that lead to the question and free conditional readings. In the question readings, the *wh*-phrase variables are bound by the question operator, which takes widest scope (see Figure 13).

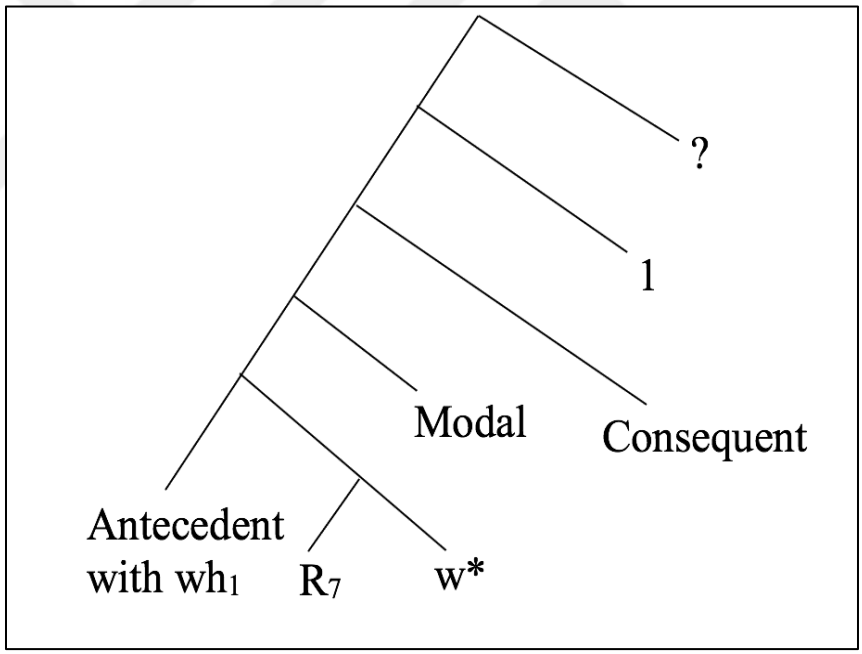



Figure 13. Question operator as a binder

In free conditionals, in contrast, I propose that the modal binds the *wh*-variable and when this is the case, the question operator is not present in the structure as illustrated in Figure 14.

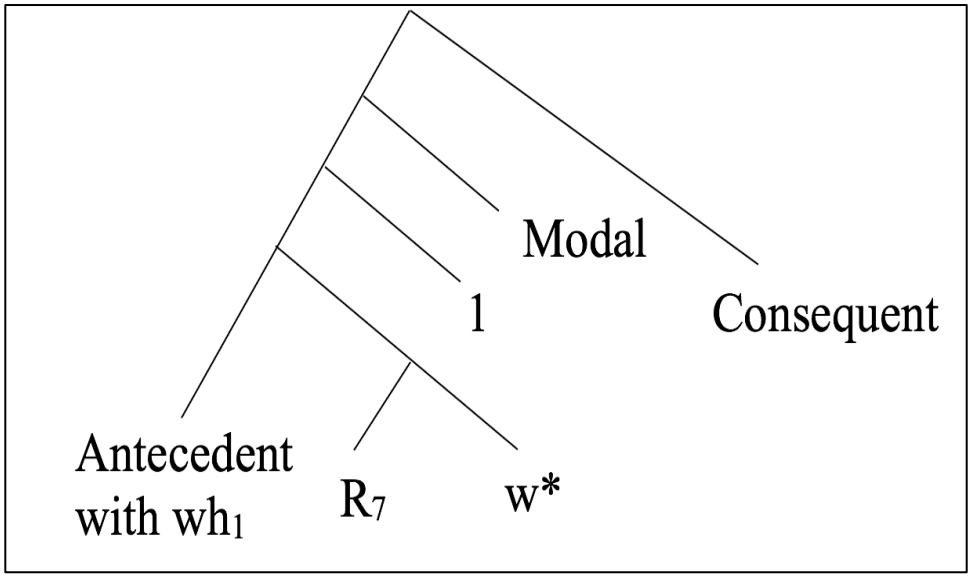



Figure 14. Modal as a binder

As the above figures show, I assume that a question operator can be present in C only if a question reading is intended and C contains a [+Q] feature, in line with most mainstream syntactic analyses of the difference between declarative and interrogative sentences . The FC interpretation follows instead when the binder of the *wh*-variable is the modal.

The idea that modals may bind individual variables goes back to Heim (1982). She proposes that indefinites denote restricted variables and, when occurring in the antecedent of conditionals as in (44), the modal in the structure can bind them as shown in Figure 15 and in (45) (Adapted from Heim, 1982, p. 121).

(44) If a woman loves a cat, she pets it.

(45) $\forall x, \forall y, ((\text{a woman}(x) \wedge \text{a cat}(y) \wedge \text{love}(x, y)) \rightarrow (\text{pet}(x, y)))$

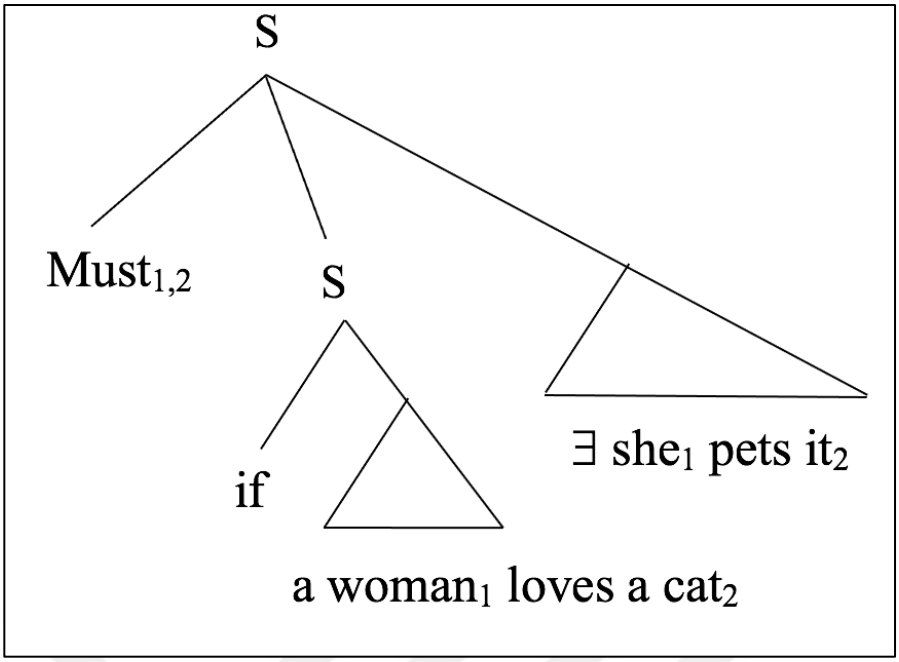



Figure 15. Heim (1982) modals as binders

As shown above, according to Heim (1982), the modal *must* is an unselective binder, that is, it may quantify both over possible worlds as well as over individuals. If the modal is a possibility modal as in (46), the resulting reading is that of an existential quantification of the indefinite (see (47)).

(46) If a woman loves a cat, she may pet it

(47) $\exists x, \exists y, ((\text{a woman}(x) \wedge \text{a cat}(y) \wedge \text{love}(x, y)) \wedge (\text{pet}(x, y)))$

Adapting Heim (1982)'s insight for indefinites into free conditionals, I claim that the modal in *wh*-conditionals can act as a binder of the variable introduced by *wh*-phrases (see Cheng and Huang, 1996 for a similar account).[24] Differing from

[24] Cheng and Huang (1996) has a similar analysis of Chinese bare conditionals as in (1)

(1) Shei xian lai, shei xian chi
Who first come, who first eat
If X comes first, X eats first

They propose the following analysis in (2) for sentences as in (1).

(2) $\forall x$ (x comes first → x eats first)

Basically, they claim that *wh*-phrases in Chinese bare conditionals are unselectively bound by operators available in the structure such as adverbs. In the case where there is no overt operator, the neccesity modal binds them. Following Heim (1982), their structure is tri-partitude. Moreover, differing from Turkish free condiitonals, in Chinese bare conditionals, there is a need for a *wh*-phrase in both the antecedent and the consequent clauses. The analysis that I proposed is similar in the sense

Heim, I propose that only universal modals may do so, for reasons I will return to in Chapter 4. Specifically, I propose that both existential and universal modals can receive the traditional interpretation in (48), but only universal ones are also unselective binders with the additional lexical entry schema in (49) .

(48) $[\![\text{Modal}]\!] = \lambda f_{<s,t>}.\ \lambda q_{<s,t>}.\ \forall/\exists w$ s.t. $f(w)=1$ then/and $q(w)=1$

(49) $[\![\text{Modal}_{\forall}]\!] = \lambda f_{<e1,<e2\ldots en<s,t>>}.\ \lambda q_{<s,t>}.\ \forall x_1\ldots x_n,\ \forall w$ s.t. $f(x_1)\ldots(x_n)(w) = 1$ then $q(w) = 1$

Therefore, according to my analysis, universal modals are lexically ambiguous, but the higher type of meaning can be derived from the basic meaning in (50).

(50) $[\![\text{Modal}_{\forall}]\!] = \lambda f_{<e1,<e2\ldots en<s,t>>}.\ \lambda q_{<s,t>}.\ \forall x_1\ldots x_n$ $[\![\text{Modal}]\!](f(x_1)\ldots.(x_n))(q)$

(48) applies in regular conditionals without *wh*-phrases in their antecedents and in question readings of *wh*-conditionals, since in these cases, the modal is only responsible for binding the worlds. (49) applies to the FC interpretations.

Given these assumptions, I propose the following LFs in Figure 16 and Figure 17 for the following question and free conditional readings in (51) respectively.

(51) Kim vazo-yu kır-sa o ceza al-ır./?
Who vase-ACC break-sA pro punishment take-AOR

(i) Free Conditional: 'Whoever breaks the vase gets punished.'

(ii) Question: 'Who$_1$ is such that if $t_1$ breaks the vase s/he$_1$ gets punished?[25]'

that I use unselective binding for Turkish conditionals with *wh*-phrases in their antecedents. However, they don't go into details of compositional semantic derivation.

[25] Note that this also has free readings, however for the reasons of presentation, I ignore those readings at the moment, which I show in the end is derived with the same mechanism that I propose in this chapter.

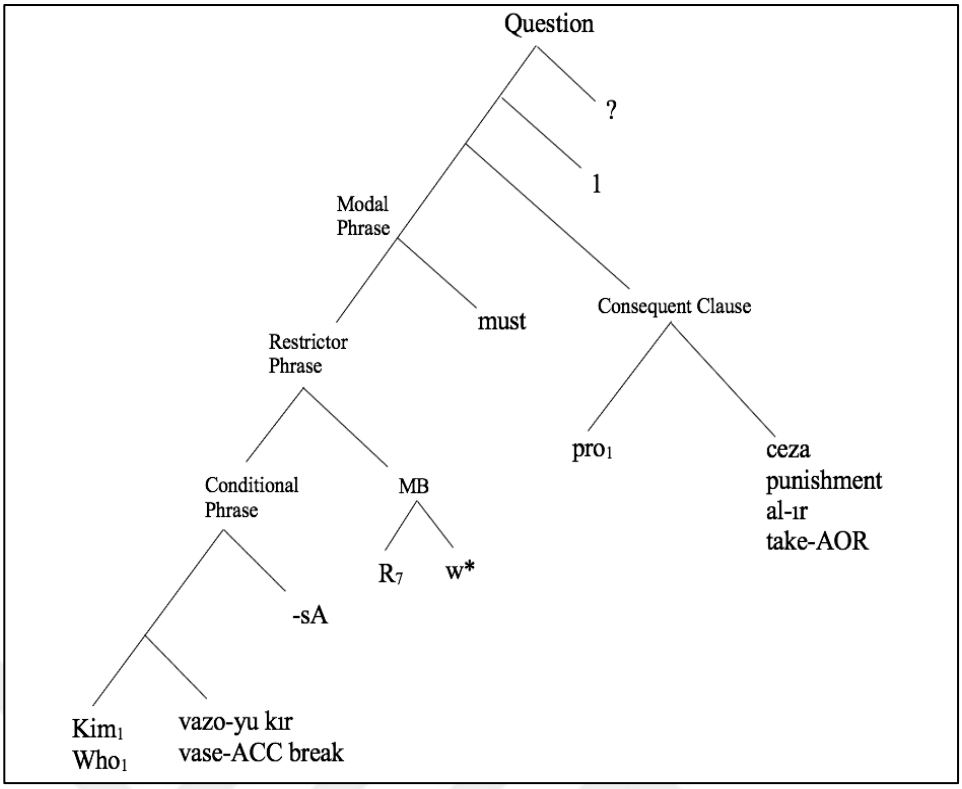



Figure 16. Question reading LF

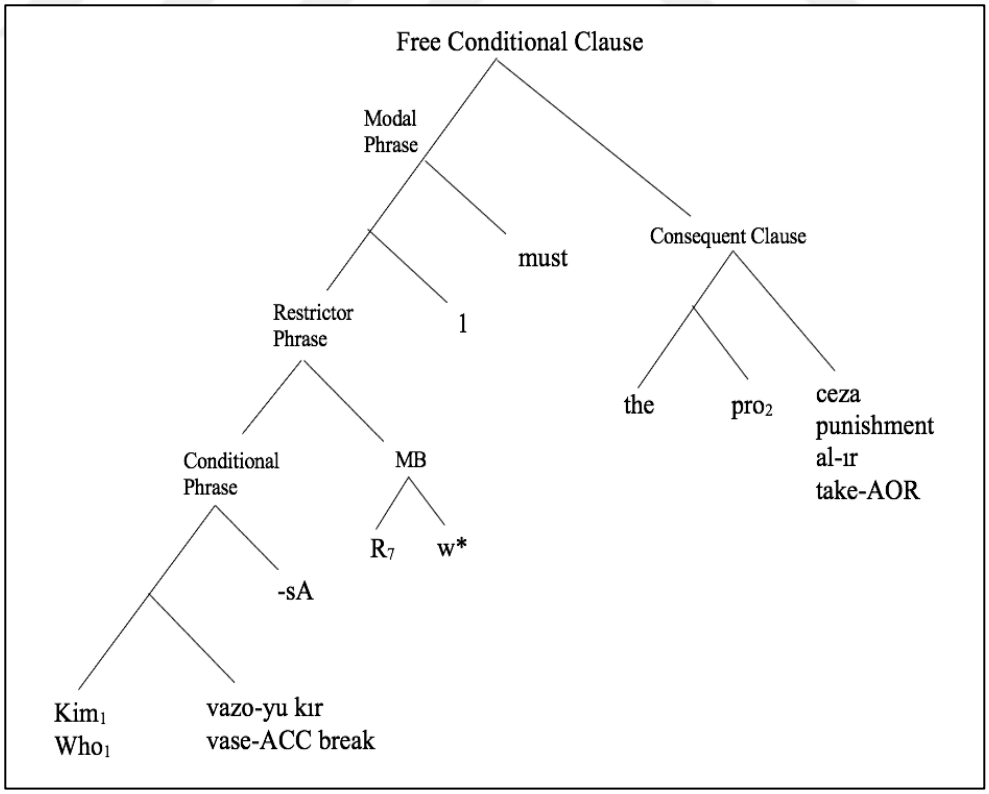



Figure 17. Free conditional reding LF

The main difference between these LFs is the presence or absence of a question operator. Figure 16 is the LF that I propose for the matrix question reading and Figure 17 illustrates the free conditional reading. The question operator in Figure 16 binds the variable in the *wh*-phrase and the result is the set of propositions corresponding to the answers to the question in (51). The question operator scopes over both *kim* ('who') and the pronoun in the main clause. Therefore, according to this proposal, the contingent reading is predicted by co-indexing and regular co-binding of them. This is not the case in Figure 17 where the modal which binds the variable in *wh*-phrase *kim* doesn't c-command the pronoun in the consequent clause. In this case, the contingent reading of the pronoun that is outside the scope of the modal can only be obtained if one adopts the E-type pronoun strategy that Demirok (2017) suggests. The step-by-step derivation of these LFs are as follows (For the sake of example, I will again assume an epistemic modal base in both derivations).

As for the semantic derivation of FC LF in Figure 17, the first step is to derive the meaning of the antecedent clause with the *wh*-phrase. As shown in (52), the *wh*-phrase, *kim*, which is a restricted variable, first combines with the predicate via regular function application and its intension is (52).

(52) Conditional Phrase

For any w and g,

(i) $[\![kır\ vazoyu]\!]^{w,g}([\![Kim_1]\!]^{w,g})$ is defined iff g(1) is a person in w, if defined

$[\![kır\ vazoyu]\!]^{w,g}([\![Kim_1]\!]^{w,g}) = 1$ iff g(1) breaks the vase in w.

(ii) Intension of the Conditional Phrase

$[\![Kim_1\ kır\ vazoyu]\!]^{¢,g} = \lambda w$: g(1) is a person in w. g(1) breaks the vase in w.

In the next step, we derive the meaning of the restrictor, the modal base, by applying the contextually salient accessibility relation to the world of evaluation (see (53)) and obtain a set of propositions.

(53) Restrictor (Modal Base)

For any w and g,

$[\![R_7]\!]^g([\![w^*]\!]^w)$ = λw'. w' is epistemically accessible from w.

Then, the intension of the conditional phrase restrictively modifies the modal base via Intensional Predicate Modification, and we obtain a partial set of worlds as shown in (54).

(54) Restrictor Phrase

For any w and g,

$[\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7]\!]^{w,g}$

= λw'. [λw'': g(1) is a person in w''. g(1) breaks the vase in w'']($w'$)

= 1 and [λw'''. w''' is epistemically accessible from w]($w'$) = 1

=λw': g(1) is a person in w'. g(1) breaks the vase in w' and w' is epistemically accessible from w.

(by IPM[26])

In the next step, we first have predicate abstraction on the index of $kim_1$ introduced by the universal modal as shown in Figure 17, and then the universal modal, *must,* applies to the property we obtain in (55) as shown in (55). Notice that since this is the FC reading, we make use of universal modal lexical entry where the modal binds both worlds and the variable denoted by the *wh*-phrase. As a result of these operations, we obtain a modal quantifier over worlds.

[26] The rule of Intensional Predicate Modification in von Fintel and Heim (2011, p. 103 ):
If α has daughters β and γ s.t. for any w and g, $[\![\beta]\!]^{w,g}$ is of type <*s,t*> and $[\![\gamma]\!]^{g}$ is of type <*s,t*> then $[\![\alpha]\!]^w$ = λw'. $[\![\beta]\!]^{w,g}$(w') = 1 and $[\![\gamma]\!]^{g}$ ( w') = 1

(55) For any w and g,

(i) Predicate Abstraction

$\lambda x.\ [\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7\ 1]\!]^{w,g[x/1]}$

$= \lambda x.\ \lambda w'$: x is a person in w'. x breaks the vase in w' and w' is epistemically accessible from w.

(ii) Modal Phrase

$[\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7\ 1\ must]\!]^{w,g}$

$[\![must]\!]^{w,g} = \lambda f_{<e,st>}.\ \lambda p_{<s,t>}.\ \forall x, \forall w'$ s.t. $f(x)(w') = 1$ then $p(w') = 1$

$[\![must]\!]^{w,g}([\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7\ 1]\!]^{w,g})$

$= \lambda p_{<s,t>}.\ \forall x.\ \forall w'$ s.t. [$\lambda x.\ \lambda w'$: x is a person in w'. x breaks the vase in w' and w' is epistemically accessible from w](x)(w') = 1 then p(w') = 1

$= \lambda p_{<s,t>}.\ \forall x, \forall w'$ s.t. x is a person in w' and x breaks the vase in w' and w' is epistemically accessible from w, then p(w') = 1

Now that we have a modal quantifier, the following step is to apply it to the consequent clause. Therefore, we first derive the meaning of the consequent clause. Recall that since this is the contingent reading , where $pro_2$ in the main clause varies depending on the antecedent but not c-commanded by the modal, we will make use of E-type pronoun strategy (Heim, 1990) as suggested by Demirok (2017). In this case, $pro_2$ refers to a contextually salient predicate of type $<e,t>$, context being the antecedent sentence. (56) shows its semantic derivation.

(56) For any w and g,

(i) E-type Pronoun

$[\![pro_{2<e,t>}]\!]^{w,g} = g(2)$

$g(2) = [\![kır\ vazoyu]\!]^{w,g} = \lambda y.$ y breaks the vase in w.

⟦*the*⟧(λy. y breaks the vase in w and y is a person in w)

= the people / maximal individual y who break the vase in w.

(from Demirok, 2017)

(ii) Consequent Clause

$⟦ceza\ alır⟧^{w,g}$ ($⟦the\ pro_2⟧^{w,g}$) = 1 iff

The maximal individual y who breaks the vase in w, takes punishment in w.

(iii) Intension of the Consequent Clause

$⟦the\ pro_2\ ceza\ alır⟧^{¢,g}$ = λw'. the maximal individual y who breaks the vase in w' takes punishment in w'

In the last step, we apply the modal quantifier that we obtained as a result of the semantic derivation in (55) to the intension of the consequent clause as shown in (57) and we obtain a truth condition as a result.

(57) For any w and g,

$⟦Kim_1\ vazoyu\ kırsa\ w^*\ R_7\ 1\ must⟧^{w,g}$ (λw'$⟦the\ pro_2\ ceza\ alır⟧^{w',g}$)

= 1 iff

∀x. ∀w' s.t. x is a person in w' and x breaks the vase in w' and w' is epistemically accessible from w then the maximal individual y who breaks the vase in w' and takes punishment in w'

As for the question reading of (51), *Who$_1$ is such that if s/he breaks the vase s/he$_1$ gets punished?*, the derivation up to the modal phrase is the same as FC reading. The lexical entry of the modal in this case is (58), repeated below.

(58) For any w and g,

$⟦must⟧^{w,g} = λf_{<s,t>}.\ λp_{<s,t>}.$ ∀w' s.t. f(w') = 1 then p(w') = 1

Since this is not an unselective binder, in contrast to FC reading, the variable introduced by *kim*$_1$ remains free in the antecedent as well as in the modal phrase as shown below in (59).

(59) Modal Phrase

For any world w and any assignment function g,

$[\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7\ \ must]\!]^{w,g}$ =

$[\![must]\!]^{w,g}([\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7]\!]^{w,g})$ =

$\lambda p_{<s,t>}$. ∀w' s.t. g(1) is a person in w' and g(1) breaks the vase in w' and w' is epistemically accessible from w then p(w') = 1

Moreover, the resulting meaning of the entire conditional is an open sentence with a variable in the antecedent coreferential with the pronoun in the consequent (see (60)).

(60) (i) Consequent Clause

Since for any w and g, $[\![pro_1]\!]^{w,g}$ = g(1)

Then,

$[\![ceza\ alır]\!]^{g}_{¢}$(g(1)) = λw. g(1) takes punishment in w

(ii) Conditional Clause

$[\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7\ pro_1\ ceza\ alır]\!]^{w,g}$

= $[\![Kim_1\ vazoyu\ kırsa\ w^*\ R_7]\!]^{w,g}$(λw. $[\![pro_1\ ceza\ alır]\!]^{w,g}$)

= 1 iff ∀w' s.t. g(1) is a person in w' and breaks the vase in w' and w' is epistemically accessible from w, g(1) takes punishment in w'.

In the next step, the two occurrences of the variable g(1) are then bound by the index 1 introduced by the *?* morpheme as in (61).

(61) Variable Binding

$[\![Kim_1\ vazoyu\ kırsa\ w^*\ R7\ pro_1\ ceza\ alır\ 1]\!]^{w,g} =$

$\lambda x.\ [\![Kim_1\ vazoyu\ kırsa\ w^*\ R7\ pro_1\ ceza\ alır\ 1]\!]^{w,g[x/1]} =$

$\lambda x.\forall$w' s.t. x is a person in w' and x breaks the vase in w' and w' is epistemically accessible from w, x takes punishment in w'

In the last step, the question operator applies to the intension of the resulting predicate in (61) and we obtain a set of propositions as (62) shows.

(62) Question Formation

$[\![?]\!] = \lambda Q_{<s,et>}.$ {p: $\exists$y s.t.. p = $\lambda$w". Q(w")(y)}

$[\![?]\!](\lambda w.\ \lambda x.[\![Kim_1\ vazoyu\ kırsa\ w^*\ R7\ pro_1\ ceza\ alır\ 1]\!]^{w,g[x/1]}) =$

{p: $\exists$y s.t. p = $\lambda$w". [$\lambda x.\forall$w' s.t. x is a person in w' and x breaks the vase in w' and w' is epistemically accessible from w, x takes punishment in w'] (w")(y) = 1}

= {p: $\exists$x and p = $\lambda$w'. $\forall$w' s.t. x is a person in w' and x breaks the vase in w' and w' is epistemically accessible from w then x takes punishment in w'}

As the result of (62) shows, unlike the LF of FC, the presence of the question operator in the question LF, Figure 16, results in the generation of a set of propositions instead of a single proposition. Moreover, what allows us to obtain the desired set, where the alternatives differ relative to the value of the variable introduced by the *wh*-phrase is the lexical ambiguity of the modal that I presented in this chapter. Notice that in the latter semantic derivation, the modal is type <*st,st*> rather than the unselective binding one of type <*e*<*st,st*>> in the previous structure.

This is what allows for the *wh*-phrase variable to be available for being bound by the higher unselective binder, ?, instead of the modal[27].

As for the deictic readings of *wh*-conditionals repeated below in (63), the semantic derivation of the FC and Q are identical to the ones above except for the interpretation of the pronoun, which receives its interpretation from the context via a contextually determined assignment function g.

(63) Kim vazo-yu kır-sa o ceza al-ır./?
Who vase-ACC break-sA pro punishment take-AOR.

(i) Deictic FC : 'Whoever breaks the vase, he (e.g: Bill) gets punished.'

(ii) Deictic Question: 'Who$_1$ is such that if $t_1$ breaks the vase he$_2$ (e.g: Bill) gets punished?'

For instance, if we assume that Bill is the salient person in the context of utterance, the denotations of the deictic free conditional and the deictic question are those in (64) and (65) respectively.

(64) Given the assignment function [1→ Bill]

∀x, ∀w' s.t. x is a person in w' and x breaks the vase in w' and w' is epistemically accessible from w, then Bill gets punishment in w'

(65) Given the assignment function [1→ Bill]

{p: ∃y. p = λw'. ∀w' s.t. y is a person and breaks the vase in w' and w' is epistemically accessible from w, then Bill takes punishment in w'}

[27] I am aware that this is not how unselective binding works. This is because, if there is a closer binder to the *wh*-phrase, in this case *must*, it should always be able to bind it. I consider this problem and offer an informal solution for it in the following part.

Summing up, in this section, I have shown that it is possible to have an analysis of *wh*-conditionals in Turkish building on *which NPs* analysis of Rullman and Beck (1998) and Heim's (1982) unselective binding. The summary of the arguments and assumptions that are presented in the current analysis are as in (66).

(66) (i) In Turkish, *wh*-phrases are restricted variables with the presupposition that the value of the variable is an element of the restrictor (from R&B, 1998).

(ii) Universal Modals have two different lexical entries. One is a Heimian unselective of type $<e_1 \ldots <e_n<st,st>>$ and the other is a regular modal determiner of type $<st,st>$.

(iii) *Wh*-phrases in the antecedent of conditionals in Turkish can be bound by an unselective binder modal or by a question operator. When bound by a modal, they acquire universal force and we obtain a free conditional reading, when bound by a question operator, we obtain a matrix question reading.

## 3.6 Some limitations of this analysis

Insofar as unselective binding (Heim, 1982) is concerned, a modal should be able to bind any variable with the same index in its scope. When we consider the LF in Figure 18, repeated from Figure 16 , as the variable *wh*-phrase *kim* is already in the scope of the modal and closer to it than the question operator, one would expect the modal to bind it.

In order to prevent this reading, as Figure 18 illustrates, I claimed that in question readings, the modal is not a binder, so that only the question operator may bind the *wh*-variable. In order to achieve this result, I needed to stipulate two

different lexical entries for universal modals, a standard one and an unselectively binding one.

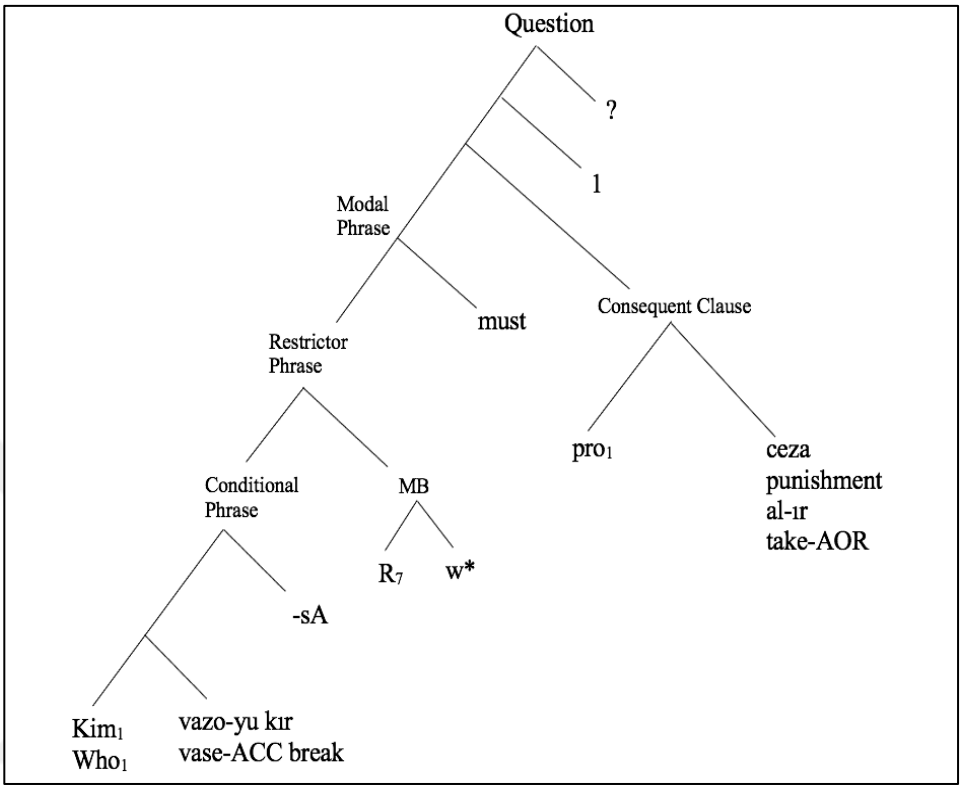



Figure 18. Question reading LF

One way to do without this stipulation is via the same pied-piping mechanism that has been proposed in the literature, in order to account for apparent exceptional scope of indefinites and *wh*-phrases out of syntactic islands (e.g: Charlow, 2017 and Demirok, 2019 among many others). One of the famous examples of in which such exceptional wide scope of an indefinite is observed is (67) as cited in Demirok (2019) (from Reinhart, 1997).

(67) If a rich relative of mine dies, I will inherit a house

∃x s.t. a rich relative of mine dies, and if x dies, I will inherit a house.

In (67), the indefinite, *a rich relative of mine*, is inside the antecedent clause, which is a syntactic island (Ross, 1967). However, this sentence has a reading where *a rich relative of mine* can be interpreted outside the scope of the modal, this receiving a specific *de re* reading. Even if Quantifier Raising (QR) outside islands should be ruled out, Charlow (2017) and Demirok (2019) propose an account of the exceptional scope of elements within the island, which does not involve regular movement. Specifically, they suggest that it is sufficient to pied-pipe the entire *if*-clause in order to predict the desired readings. Informally, what happens in pied-piping is as follows. In (67), the whole antecedent clause, *if a rich relative of mine dies*, is semantically turned into a scope taking object which, as a whole, needs to QR outside the scope of the modal, leaving a trace whose interpretation includes an identity function. As a result, since the whole island can take scope outside the intensional context created by the modal, the indefinite gets *de re* reading without escaping from the island. In a way, this mechanism allows both to conform to island constraints and to achieve desired meanings.

Similarly, in our case, in order to obtain the question interpretation, the *wh*-phrase needs to be outside the scope of the modal to ensure that modal doesn't bind the variable it introduces. Without the violation of an island constraint, one way to achieve this is to pied-pipe the *if*-clause outside the scope of the modal. To make it concrete, let's look at the following example in (68).

(68) Kim vazo-yu kır-sa ceza al-ır./?
Who vase-ACC break-sA punishment take-AOR

(i) Free conditional: 'Whoever breaks the vase gets punished.'

(ii) Question: 'Who$_1$ is such that if (s/)he$_1$ breaks the vase s/he$_1$ gets punished?'

Following Demirok (2019), I suggest pied-piping the whole *if*-clause, *kim vazoyu kırsa*, ('if who breaks the vase'), after turning it into a scope taker.[28] As a result, the *wh*-phrase is interpreted outside the scope of the modal which means that only the question operator can bind it. This way, the question interpretation may be obtained without the need of a stipulated ambiguity for modals. In order to keep the above discussion simple and focus on the main aspects of my contribution, I adopted the ambiguity stipulation in the exposition of my proposal and didn't directly apply the solution I am mentioning here, which would make the technical details a lot more complex.

### 3.7 Advantages over the previous analysis

The current analysis has two advantages over the analysis of Demirok (2017). It avoids the overgeneration problem in plain *wh*- questions and achieves the binding in contingent question readings without resorting to E-type analysis.

In the current analysis, the assumption of Rullman and Beck (1998)'s *wh*-semantics and the potentiality of being bound by a modal avoids the necessity of the assert operator which was responsible for overgeneration problem of Demirok's analysis (see Section 3.4). This is because, under this semantics, it is the lexical ambiguity of the necessity modal and the absence of the question operator that allows the FC readings, not the assertion of the alternatives. As a result, the present analysis doesn't run into the problem of overgeneration in simple *wh*-questions.

[28] Note that the original analysis of Demirok (2019) involves a different question semantics and there is different technical apparatus that he uses. Whether we can adopt this analysis and apply it to the current analysis is an open question since I have different question semantics, *wh*-phrases as restricted variables. In a way, what I suggest here as a solution can also be considered as pied-piping, similar to Demirok (2019) and Charlow (2017) since we move the whole conditional antecedent along with the *wh*-phrase in order not to violate the island constraints. Though, one needs to have further research how this can be technically achieved within this analysis. See Demirok (2019) and Charlow (2017) for the details of their analyses.

Also, within this analysis, we can maintain the same semantics for *wh*-phrases everywhere just as Demirok.

The second advantage of the current analysis is the fact that in the question readings, the pronoun in the main clause can be bound by the higher question operator without requirement of E-type analysis as the simplified LF in (69) shows.[29]

(69) LF: [$?_1$ [must who$_1$ breaks the vase] (s/)he$_1$ gets punished]]

This follows from the compositional analysis that I proposed in the spirit of Rullman and Beck (1998)'s *wh*-semantics. In contrast, according to Demirok's (2017) analysis, it is not possible to bind the pronoun in this way. This is because, in this analysis, there isn't any higher operator that can bind both the *wh*-phrase and the pronoun in the main clause. That analysis requires a different mechanism to account for such binding. In that sense, the current account is advantageous since it automatically binds the pronoun without requiring any other operator or E-type analysis.

### 3.8 Do we have overgeneralization in modal sentences?

The current analysis can account for the overgeneration problem with non-modalized *wh*-questions. One may think that this might lead to overgeneralization in constituent

[29] Although it is advantageous to bind the pronoun through regular co-binding, it might result in unexpected readings for cases like (1) (Adapted from Demirok, 2017, p. 164)

(1) pro Anne-si kim-i sev-er?
Mother-POSS who-ACC love-AOR
Unbound: Who$_1$ does his$_2$ mother love?
Cobound: #Who$_1$ does his$_1$ mother love?

In (1), the part *annesi,* ('his mother'), precedes the *wh*-phrase kim on the surface. Within this configuration, we cannot have co-bound reading of who and the pro of the mother. The only reading is the unbound one. However, within my analysis, adopting R&B (1998), since the question morpheme is higher in the structure, it can bind both the pro and the wh-phrase. Therefore, the co-bound reading should be possible contrary to the fact. (Ömer D, p.c., July 2, 2021). As for this issue, it is an open question whether we can have any constraint on the binding potentiality of the question morpheme.

modal questions as in (70) considering its similarity to a *wh*-conditional sentence as in (71).

(70) Kim ceza al-malı?
Who punishment take-NECC

'Who must get punished?'

(71) Vazo-yu kim kır-dı-ysa ceza al-malı./?
Vase-ACC who break-PST-ise punishment take-NECC

(i) FC: 'Whoever broke the vase must get punished.'

(ii) Question: 'Who$_1$ is such that if s/he$_1$ breaks the vase, s/he$_1$ must get punished?'

(70) is a constituent question with a necessity modal, *-mAlı*, *must*. It has only matrix question reading. In contrast, (71) is a *wh*- conditional and it is ambiguous between a free conditional and a question reading. Considering that both includes a modal and a *wh*-phrase, at first look, one may think that the present analysis predicts that (70) should also have a declarative reading like *everyone must be punished* in parallel with free conditional reading in (71). However, this is not true. The current analysis correctly predicts that (70) can be interpreted only as a matrix question. This is because, in the current analysis, a modal can bind the *wh*-phrase as long as the *wh*-phrase is in its restrictor part, in its scope. Since (70) is a modal sentence, according to Kratzer (1991), its restrictor is covert and provided by the contextual information, which is a modal base. Therefore, the *wh*-phrase in (70) is not in the restrictor of the modal. Differing from (70), in (71), the *wh*-phrase is in the restrictor of the modal along with the modal base. The following LF representations in (72) and (73), respectively for (70) and (71) show this contrast.

(72) [$_{\text{antecedent}}$ must $R_7$(accessibility relation) w*] who punishment take]

(73) [$_{\text{antecedent}}$ must $R_7$ w* who vase break] s/he punishment take]

Notice that in (72), only the accessibility relation restricts the modal and the part *who punishment take* is the prejacent, like the consequent clause in (73). In that sense, in parallel with conditional structures, we can think of modal sentences as consequent clauses of conditionals whose antecedents are covert. Hence, the fact that there is no declarative reading for modal constituent questions naturally follows from the current analysis.

## 3.9 Conclusion

In this chapter, I proposed a novel semantic analysis for *wh*-conditionals in Turkish. Firstly, I showed that these sentences are four-way ambiguous, namely, contingent free conditional, deictic free conditional, contingent question and deictic question. I showed that it is possible to obtain desired meanings for all readings by adopting Demirok (2017). I also demonstrated that when we extend the analysis of Demirok to plain constituent questions in Turkish, it leads to overgeneration due to its semantics of questions (Hamblin, 1973). Following that part, I proposed a different analysis for *wh*-conditionals in the spirit of R&B (1998) where *wh*-phrases are restricted variables, and the question operator is responsible for generating alternatives. As for the conditionals, I adopted the analysis of Kratzer (1986) where *if*-clauses contributes to the restrictor of the modals. Having these independent parts available at hand, I had the correct truth conditions in the end for all the readings available. In the question readings, I claimed that the question operator is available, and it binds the *wh*-phrase in the structure. In contrast, in the free conditional readings, it is the unselective binder modal that is responsible for binding the *wh*-variable in the structure. In the end, for question readings, I obtained a set of propositions and for free conditionals I obtained a statement. Lastly, to account for contingent readings in

free conditionals, I adopted E-type analysis (Heim, 1990) just as Demirok (2017). In contrast, in question readings, I showed that the question operator binds both the *wh*-variable and the pronoun in the main clause. By having such account, I solved the problem of overgeneration constituent questions and achieved bound readings in questions without resorting to E-type strategy.

In the next chapter, I focus on free conditional readings of *wh*-conditionals with overt existential modals which seem to pose a problem for the current analysis.

# CHAPTER 4

# EXISTENTIAL MODALS AND FREE CONDITIONALS

## 4.1 Introduction

In the previous chapter, I provided a compositional analysis of the different readings of *wh*-conditionals. Specifically, I claimed that free conditional readings are obtained when a universal modal binds the *wh*-variable. This analysis predicts that also in *wh*-conditionals with overt existential modals, the existential modal should be able to bind the *wh*-variable. As a consequence, in this case, in the FC interpretation, the quantification over the elements in its restrictor should have existential force, rather than universal. However, this prediction is not borne out. In order to overcome this problem, I assume a double-modal analysis for these cases inspired to von Fintel and Iatridou (2005) theory of anankastic conditionals.[30]

## 4.2 Turkish *wh*-conditionals with overt existential modals

In Turkish, *-Abil* is a marker of possibility, permission and an ability. For the purpose of this chapter, I will focus in the former two meanings, as they are undoubtedly existentials. The sentences in (1) and (2) are examples of *wh*-conditionals where *-Abil* receives an epistemic and permission interpretation respectively.

[30] A note is in order here: In this chapter, I mainly focus on the free conditional readings of wh-conditionals. From time to time, I don't provide the question readings to focus more on the free conditionals. Also, sometimes I use the phrase 'free conditional' to refer to the reading so as not to repeat all the time the phrase 'free conditional reading of the wh-conditional'.

(1) Dün kim parti-ye git-ti-yse katil o
Yesterday who party-DAT go-PST-ise murderer s/he
ol-abil-ir.
be-PSB-AOR

FC: 'Whoever went to the party yesterday might be the murderer.'

Q: 'Who$_1$ is s.t. if t$_1$ came to the party yesterday and (s/)he$_1$ might be the murderer?'

(2) Ali ne zaman markete gitse çikolata al-abil-ir.
Ali what time market-DAT go-sA-1.SG chocolate buy-PRM-AOR.

FC: 'Whenever Ali goes to the market, he is allowed to buy some chocolate'

Q: 'When is such that Ali goes to the market and he is allowed to buy some chocolate?'

According to the analysis that I proposed for FC readings, the modal available in the structure should bind the *wh*-phrase *kim* in (1) and *ne zaman*, in (2). Since possibility and permission modals have an existential force, my analysis predicts the following interpretations in (3) and (4) respectively for (1) and (2).

(3) For some world w, for some individual x, x went to the party in w, and x is the murderer in w.

(4) For some world w, for some time t, where Ali goes to market in w at t, and he buys some chocolate in w at t.

However, (3) and (4) are not the natural paraphrases of these sentences. The correct paraphrases are as follows in (5) and (6) respectively.

(5) For every individual x and world w s.t. x went to the party in w, there is a world w' s.t. x is the murderer in w'.[31]

[31] I thank Omer Demirok for making me realize that this reading is the correct one.

(6) For every time x and world w s.t. Ali goes to the market in w at t, there is a world w' s.t. Ali buys some chocolate in w' at t.

Given these natural paraphrases of FC readings, it seems that in the presence of an overt existential modal, the existential modal scopes only over the consequent clause and the antecedent clause restricts a covert universal modal. Therefore, the availability of such readings poses a problem for the current analysis.

## 4.3 Diagnostics for covert universal modal

In order to account for the interpretation of the cases at hand, I propose that indeed their structure contains a silent universal modal as shown in Figure 19 (see von Fintel & Iatridou, 2005 for a similar analysis)[32].

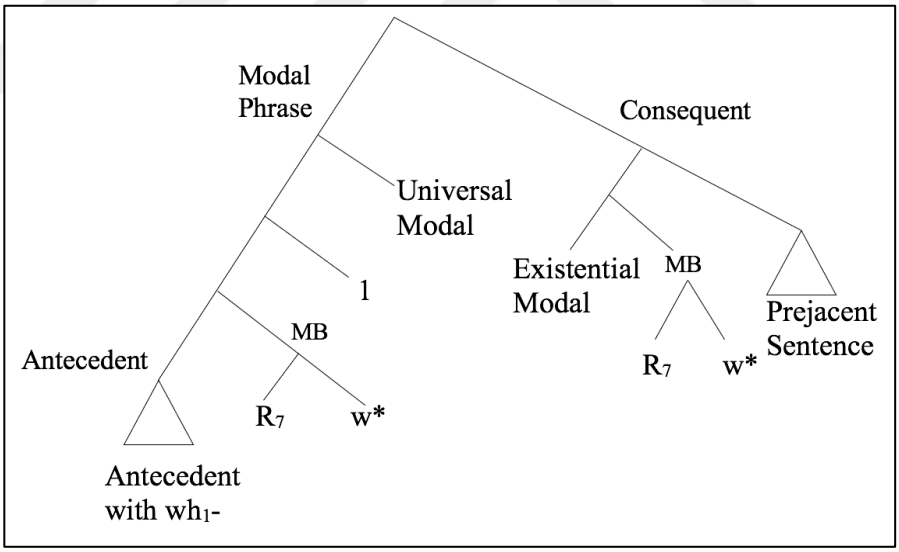



Figure 19. Double-modal structure

[32] von Fintel and Iatridou (2005) suggests a double modal analysis for anankastic conditionals (Sæbø, 2001 like (1)

(1) If you want to go to Harlem, you have to take the train A.

In their analysis, the need for another modal in the antecedent is for having different ordering source and modal base. I don't go into details of their analysis since it is for different cases.
Also, as cited in Phillips-Brown (2020), there are similar double-modal analysis such as Huitnik (2008), Condoravdi and Lauer (2016) in addition to von Fintel and Iatridou (2005)'s analysis. My analysis is inspired to von Fintel and Iatridou (2005)'s.

In this section, I present facts involving Minimizer Negative Polarity Items (NPI), that lend plausibility to this assumption.

It is well known that (weak) NPIs are acceptable in the restrictor of universal quantifiers, but not in the restrictor of existential quantifiers (Ladusaw, 1979). (7) and (8) show this distinction in English.

(7) Everyone who has ever been abroad should know this

(8) *Someone who has ever been to England should know this.

This is the case also for so called 'minimizer NPIs', that are idioms that involve reference to minimal amounts or extensions, like *say a word, bat an eyelash, hurt a fly etc.* Heim (1984) shows that minimizers are grammatical in the restrictor of a universal quantifier, if the result is a lawlike generalization, but are ungrammatical in the restrictor of an existential quantifier. (9) and (10) respectively show this contrast.

(9) Everyone who says a word against me will face the consequences.

(10) *Someone who says a word against me will face the consequences.

The corresponding expression *bir kelime dahi et-* ('say a word') patterns in the same way. In parallel with English examples in (9) and (10), when *bir kelime dahi et-* occurs in the scope of *herkes* ('everyone'), the sentence is grammatical (see (11)). In contrast, when it occurs in the scope of an existential quantifier like *biri* ('someone'), it results in an ungrammatical sentence as (12) shows.

(11) Bir kelime dahi ed-en herkesi vur-ur-um.
One word too say-REL everyone-ACC kill-AOR-1.SG

'I will kill everyone who says a word'

(12) *Bir kelime dahi eden birileri-ni vur-ur-um.
One word too say-REL some person-ACC kill-AOR-1.SG

Intended Meaning: 'I will kill someone who says a word'

Having established that also the Turkish minimizer *bir kelime dahi et-* is acceptable in the argument of a universal determiner, but not in the argument of an existential one, we expect that only universal modal determiners may license this expression in their antecedent, whereas existential modal determiners should not. Noticeably, this minimizer is acceptable in (13), where the overt modal is existential.

(13) Kim bir kelime dahi ed-er-se (on-u) vur-abil-ir-im.[33]
Who a word too say-AOR-ise him/her kill-PSB-AOR-1.SG
'Whoever says a word, I might kill him/her.'

If the antecedent in (13) was the restrictor of the existential modal, *bir kelime dahi et-* ('say a word') should be ungrammatical in it, as it is in (12). The grammaticality of (13) suggests that it may have an LF where the antecedent restricts a universal modal determiner instead, and where the existential modal scopes only over the consequent sentence. This is exactly the LF I suggested above in Figure 19.

Importantly, this possibility is not limited to *wh*-conditionals, as also regular conditionals with *-Abil* can license minimizers in their antecedent, as shown in (14).

(14) John bir kelime dahi ed-er-se on-u vur-abil-ir-im.
John a word too say-AOR-ise him/her kill-PSB-AOR-1.SG
'If John says a word, I might kill him.'

Given this, Kratzer's (1986) proposal of a universal silent modal in bare conditionals needs to be extended to cases of conditionals with overt existential modals in Turkish.

Summing up, my assumption that conditional sentences with existential modals have interpretations in which the antecedent restricts a silent universal modal is supported by evidence involving licensing of minimizer NPIs.

[33] This is unambiguously a free conditional due to first singular pronoun subject.

## 4.4 Proposal: Double-modal analysis

As the previous section shows, the existential cannot be the determiner whose restrictor contains an NPI. Hence, the existential takes narrower scope and the antecedent of the *wh*-conditionals, possibly also that of regular conditionals, in Turkish restricts a universal silent modal determiner. Based on the proposed LF in the previous section (see Figure 19), I propose the following LF in Figure 20 for the free conditional reading of the following *wh*-conditional sentence in (15).

(15) Kim parti-ye git-se eğlen-ebil-ir.
Who party-DAT go-sA have-fun-PSB-AOR

'Whoever goes to the party might have fun.'

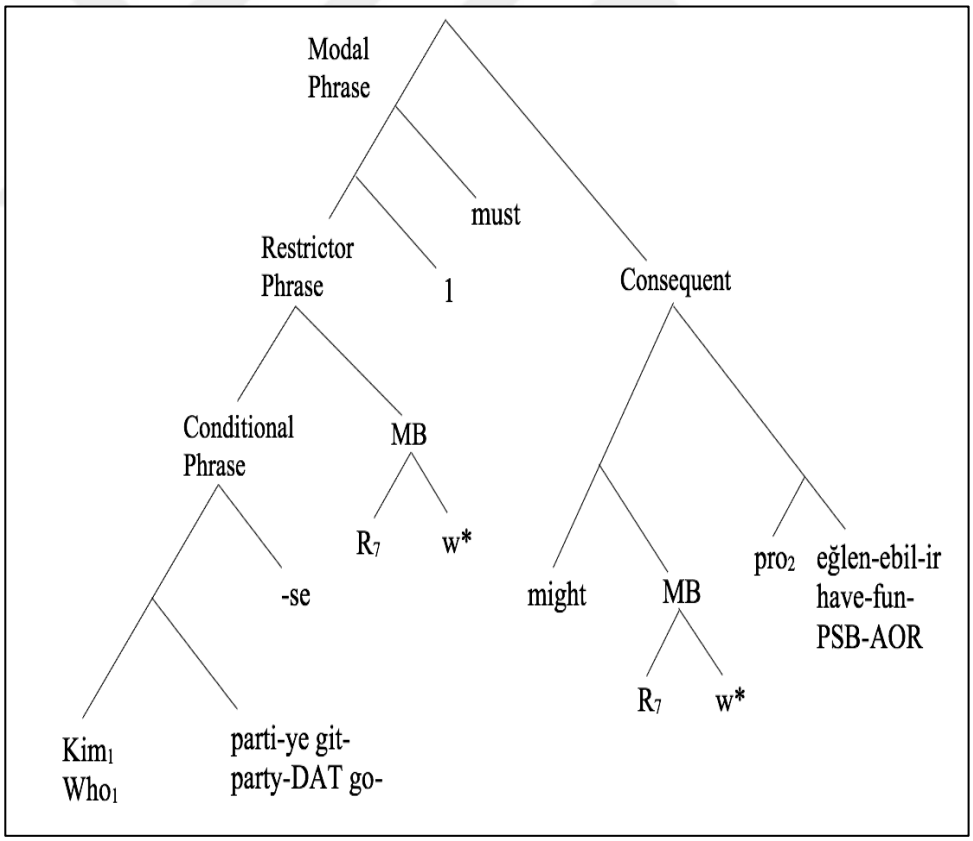



Figure 20. Free conditional with an existential modal in the consequent

Notice that the universal modal quantifier takes scope over the consequent (which contains an existential modal) whereas the existential only scopes over the proposition '(s/)he has fun'.

When it comes to its semantic derivation, it is as follows (For the purpose of illustration, I assume that the context provides an epistemic accessibility relation for both modals). The first step is to derive the meaning of the conditional phrase. As in (16), we derive the meaning of the conditional phrase (antecedent) by combining the *wh*-phrase with the predicate.

(16) Conditional Phrase

For any world w and any assignment function g,

$[\![Kim_1\ partiye\ git]\!]^{w,g}$ =

$[\![partiye\ git]\!]^{w,g}(g(1))$ is defined iff g(1) is a person in w, if defined

$[\![partiye\ git]\!]^{w,g}(g(1)) = 1$ iff g(1) goes to the party in w.

The next step is to construct the restrictor phrase. First, we obtain the interpretation of the modal base, by applying the contextually salient accessibility relation to the world of evaluation. Then, the conditional phrase in (16) restrictively modifies the modal base by Intensional Predicate Modification rule, and as a result, we obtain the denotation of the restrictor phrase. (17) shows this derivation process.

(17) For any w and g,

(i) Modal Base

$[\![R_7\ w^*]\!]^{w,g}$ =

$[\![R_7]\!]^{w,g}(w) = \lambda w'.$ w' is epistemically accessible from w.

(ii) Restrictor Phrase

$[\![Kim_1\ partiye\ git\ R_7\ w^*]\!]^{w,g}$ =

λw'. [λw'': g(1) is a person in w''. g(1) goes to the party in w'']($w'$)
= 1 and [λw'''. w''' is epistemically accessible from w.]($w'$) = 1
= λw': g(1) is a person in w'. g(1) goes to the party in w' and w' is epistemically accessible from w.

Then, we have the predicate abstraction due to the index 1 in Figure 20 and apply the modal to the resulting property by regular function application. Recall from Chapter 3 that since this is a free conditional reading, we make use of the lexical schema of the unselective universal modal binder which is of type $<e_1 \ldots e_n<st,st>>$. As a result, we obtain a universal modal quantifier (see (18)).

(18) For any w and g,

(i) Predicate Abstraction

$[\![Kim_1\ partiye\ git\ w^*\ R_7\ 1]\!]^{w,g[x/1]}$ = λx. λw': x is a person in w'. x goes to the party in w' and w' is epistemically accessible from w.

(ii) Modal Phrase

$[\![must]\!]^{w,g}$ = $\lambda f_{<e,st>}.\ \lambda p_{<s,t>}.\ \forall x, \forall w'$ s.t. f(x)($w'$) = 1 then p($w'$) = 1

$[\![Kim_1\ partiye\ git\ w^*\ R_7\ 1\ must]\!]^{w,g[x/1]}$

= $[\![must]\!]^{w,g}([\![Kim_1\ partiye\ git\ w^*\ R_7\ 1]\!]^{w,g})$= $\lambda p_{<s,t>}.\ \forall x, \forall w'$ s.t. x is a person in w' and x goes to the party in w' and w' is epistemically accessible from w, p($w'$) = 1

Now that we have derived the meaning of the modal phrase, in the following step, we derive the meaning of the consequent clause which will later combine with the universal modal quantifier. Notice that as Figure 20 shows, since I proposed a double-modal analysis, the consequent clause also involves an existential modal, which is due to the marker *-Abil* in the consequent. That is, the consequent clause in this case is a modal sentence. Recall from Chapter 2 that, in modal sentences, the

restrictor phrase is covert which is constructed by applying the contextually salient accessibility relation to the world of evaluation. Therefore, we first obtain the meaning of the restrictor phrase (see (19)).

(19) Consequent Restrictor Phrase

For any w and g

$[\![R_7\ w^*]\!]^{w,g}$ =

$[\![R_7]\!]^{w,g}(w) = \lambda w'.$ w' is epistemically accessible from w.

Next, the existential modal determiner applies to the restrictor phrase and we obtain an existential modal quantifier as shown in (20). In this case, we use the regular modal lexical entry of type <*st,st*>.

(20) Consequent Modal Quantifier

For any w and g,

$[\![might]\!]^{w,g} = \lambda p_{<s,t>}.\ \lambda q_{<s,t>}.\ \exists w'$ s.t. p(w') = 1 and q(w') = 1

$[\![might]\!]^{w,g}([\![R_7\ w^*]\!]^{w,g})$

$= \lambda q_{<s,t>}.\ \exists w'$ s.t. w' is epistemically accessible from w and q(w') = 1

Following that part, we derive the meaning of prejacent sentence in the consequent clause. Recall from Chapter 3 that since we cannot have co-binding of the *wh*-variable and the pronoun in the consequent in FC readings, we maintain an E-type analysis (see (21)).

(21) Consequent Prejacent

For any w and g,

Pro is copied from the antecedent clause, which is of type <e,t>

$[\![pro_2]\!]^{w,g} = \lambda y.$ y goes to the party in w

$[\![the]\!]([\![pro_2]\!]^{w,g})$ = the maximal individual y who goes to the party in w. (from Demirok, 2017)

⟦*the pro₂ eğlen*⟧$^{w,g}$ =

⟦*eğlen*⟧$^{w,g}$(⟦*the pro₂*⟧$^{w,g}$) = 1 iff the maximal individual y who goes to the party in w has fun in w.

Then, we obtain the truth condition of the consequent clause by applying modal quantifier to the intension of the prejacent sentence as in (22).

(22) Consequent Clause

⟦*might R₇ w* the pro₂ eğlen*⟧$^{w,g}$ =

⟦*might R₇ w**⟧$^{w,g}$ (λw. ⟦*the pro₂ eğlen*⟧$^{w,g}$) = 1 iff

∃w' s.t. w' is epistemically accessible from w and the maximal individual y who goes to the party in w' has fun in w'.

Lastly, to obtain the truth condition of the free conditional, we apply the universal modal quantifier to the intension of the consequent clause as shown in (23).

(23) Free Conditional Clause

⟦*must Kim₁ partiye git R₇ w* 1 might R₇ w* the pro₂ eğlen*⟧$^{w,g}$

= ⟦*must Kim₁ partiye git w* R₇ 1*⟧$^{w,g[x/1]}$(λw. ⟦*might R₇ w* the pro₂ eğlen*⟧$^{w,g}$) = 1 iff

=[λp$_{<s,t>}$. ∀x, ∀w' s.t. x is a person in w' and x goes to the party in w' and w' is epistemically accessible from w then p(w') = 1]

(λw''[[∃w''' s.t. w''' is epistemically accessible from w'' and the maximal individual y in w''' who goes to the party in w''' have fun in w''']⟧$^{w,g}$) = 1 iff

∀x, ∀w' s.t. x is a person in w' and x goes to the party in w' and w' is epistemically accessible from w, ∃w'' s.t. w'' is epistemically accessible from w' and the maximal individual y who goes to the party in w'' have fun in w".

We can rephrase the truth condition we obtained as in (24).

(24) For every person x and world w' compatible with the evidence in w, if x goes to the party in w' then there is a world w'' compatible with the evidence in w' where the people who go to party in w'' have fun in w''.

Having two modals in the structure and restricting the existential modal to the consequent phrase allow to get the paraphrase in (24) which is the natural reading of the FC reading of the sentence *Kim$_1$ partiye gitse eğlenebilir* ('Whoever goes to the party might have fun.').

So far, I have shown how a double modal analysis can derive the attested readings of FCs in the presence of an existential modal. This however does not prevent the availability of a reading where the existential modal takes scope over the entire conditional and binds the *wh*-variable (see (25)).

(25) Kim parti-ye git-se eğlen-ebil-ir.
Who party-DAT go-se have-fun-PSB-AOR

(i) Existential FC: For some world w' for some individual x in w', x goes to the party in w' and the maximum individual y who goes to the party in w' has fun in w'.

(ii) Universal FC: For all world w' and for all individuals x in w' s.t. x goes to the party in w', for some world w'' the maximal individual y who goes to the party in w'' has fun in w''.

In order to prevent the unattested interpretation, in Chapter 3, I introduced the stipulation that universal modals have but existential modals do not have an unselective binding lexical entry. (26) and (26), repeated from Chapter 3 respectively shows this lexical ambiguity.

(26) (i) Non- Binder: [[Modal]] = $\lambda f_{<s,t>}$. $\lambda q<s,t>$. $\forall/\exists w$ s.t. f(w)=1 then / and q(w) =1

(ii) Binder: [[$Modal_{\forall}$]] = $\lambda f_{<e1,<e2..en<s,t>>}$. $\lambda q<s,t>$. $\forall x1 \ldots x_n, \forall w$ s.t. $f(x_1) \ldots (x_n)$ (w) = 1 then q(w) = 1

This is a technical solution to avoid the existential FC reading. However, it is evidently a stipulation, since unselective binding as proposed in Heim (1982) is not so constrained.

## 4.5 The problem of the double-modal analysis

The problem of the current analysis lies in the truth conditions we obtain as a result of having two modals in the structure. Von Fintel and Heim (2011) shows this problem within the realm of strict implication analysis where the word *if* has a denotation equal to that of a universal modal determiner and the overt modal's scope is restricted to the consequent sentence only. Similarly, in Turkish, for the following conditional sentence in (27), if we maintain a double modal analysis, it results in the following truth condition in (28) which might not be the correct one.[34]

(27) John evde-yse, Bill ev-de ol-abil-ir.
John home-ise Bill home-LOC be-PSB-AOR

'If John is at home, Bill might be at home'

(28) For the actual world,

$\forall$w' s.t. compatible with the evidence in the actual world, John is at home in w' then there is a world w'' s.t. compatible with the evidence in w', Bill is at home in w''.

[34] These judgments are mine, therefore, a further experimental work is required to check whether native speakers judge these truth conditions as I do.

The problem with this truth condition is that according to it, the prejacent in the consequent is evaluated with relative to the evidence available in those worlds that are universally quantified over by the universal modal rather than the evidence available in the actual world. That is to say, since the modals are nested, the evaluation world of the consequent is that of possible worlds that are universally quantified. However, if in those worlds there is no evidence that Bill is at home, but the evidence is available in the actual world, the sentence seems to be false although it should be true with relative to the actual world. Therefore, we cannot capture the correct truth conditions for such kinds of sentences. Similar problem also arises in free conditional sentences as in (29). The following truth condition in (30) is obtained if we maintain a double modal analysis.

(29) Eve kim gel-se Bill uyu-yabil-ir.
Home-DAT who come-sA Bill sleep-PSB-AOR
'Whoever comes home, Bill might sleep.'

(30) For the actual world and any assignment function g,
∀w', x s.t. w' is compatible with the evidence in the actual world, x is a person in w' and x comes home in w' then there is a world w'' s.t. compatible with the evidence in w' and Bill sleeps.

Again, in this case, the same problem arises since there might be no evidence in those worlds that we universally quantify over that Bill might sleep. Von Fintel and Heim (2011) discusses this problem for conditionals with epistemic flavours. One also needs to check if the same problem arises in the cases with deontic or circumstantial flavours. Within the scope of this thesis, I don't have any solution for this issue. There is a need for further research within this respect.

## 4.6 Conclusion

In this chapter, I revised the compositional analysis that I proposed in Chapter 3. First, I showed that the natural reading of *wh*-conditionals with overt existential modals involves a universal quantification of the *wh*-variable. Therefore, I implemented double modal analysis for free conditionals in Turkish. Within this respect, I assumed that a covert universal modal determiner is responsible for binding the variable introduced by the *wh*-phrase. I further argued that NPI licensing in the antecedent of regular conditionals and *wh*-conditionals with existential modals provide evidence for this proposal. The double modal analysis allowed us to obtain correct readings within the present analysis. I concluded the discussion with the truth conditions one obtains under the double modal view I suggested and left open to further research the question of how to test their descriptive correctness.

# CHAPTER 5

# CONCLUSION

## 5.1 Summary of the thesis

In this thesis, I provided a semantic analysis for *wh*-conditionals in Turkish. I observed that while conditionals with *wh*-phrases in the antecedents (*wh*-conditionals) as in (1) are ambiguous between question and free conditional readings the ones with *wh*-phrases in the consequent clause can only be interpreted as matrix questions (see (2)).

(1) John kim-i gör-ür-se selam ver-ir./?
John who-ACC see-AOR-ise salute-AOR

(i) Free Conditional: 'John salutes whoever he sees.'

(ii) Question: 'Who$_1$ is such that if John sees $t_1$ then he salutes him/her$_1$?'

(2) John parti-ye gel-ir-se kim gel-ir?
John party-DAT come-AOR-ise who come-AOR

'If John comes to the party, who else comes?'

Secondly, I showed that when we consider the interpretation of the pronoun in the consequent clause, these sentences are four way ambiguous (see Demirok, 2017). (3) illustrates this ambiguity.

(3) Partiy-e kim gel-se (o) eğlen-ir.
Party-DAT who come-sA s/he have-fun-AOR

(i) Contingent Free Conditional: 'Whoever comes to the party, s/he has fun'

(ii) Deictic Free Conditional: 'Whoever comes to the party, he (e.g: Bill) has fun.'

(iii) Contingent Question: 'Who$_1$ is such that if $t_1$ comes to the party, s/he$_1$ has fun?'

(iv) Deictic Question: 'Who$_1$ is such that if $t_1$ comes to the party, he$_2$ (e.g: Bill) has fun?'

Based on these observations, I proposed an alternative compositional analysis to only previous analysis of Turkish free conditionals (Demirok, 2017).

In Chapter 2, I introduced the technical apparatus that I use to analyze Turkish *wh*-conditionals. First, I shortly introduced possible world semantics of von Fintel and Heim (2011) which I used through all semantic derivations in this thesis. Then, since *wh*-conditionals involve conditional and question semantics, I introduced the analyses that I adopted for each. As for questions, I adopted Rullman and Beck's (1998) analysis of *which NP* phrases and its extension in von Fintel and Heim (2001). I showed that the analysis of R&B can be a good candidate for Turkish *wh*-questions considering that Turkish is generally considered as a *wh*- in situ language (Arslan, 1999 and Görgülü, 2006 among many others). Moreover, I also summarized the account of Krazter's (1986) restrictive conditional analysis, which I used to analyze *wh*-conditionals in Turkish.

The main finding of Chapter 3 was that adopting a different question analysis can allow us to derive correct truth conditions of *wh*-conditionals without facing the problems of overgeneration in the previous analysis. I first showed that Demirok's (2017) analysis building on Rawlins (2013) can account for all readings, yet it results in overgeneration problems when we extend this analysis to all *wh*-questions in Turkish. I demonstrated that this results from the assert operator present in the structure of Demirok. That is, since the assert operator freely asserts all the

alternatives in this analysis, it is possible to have it also in plain *wh*-questions in Turkish such as (4).

(4) Kim kedi gör-dü?
Who cat see-PST

'Who saw a cat?'

However, (4) has only the matrix question reading, which shows that the assert operator is problematic. The need for an assert operator according to Demirok's analysis results from the fact that *wh*-phrases are sources of alternatives (Hamblin, 1973). Since alternative generation starts at the level of *wh*-phrases, the only way to obtain a free conditional reading, which is a declarative one, is to use an assert operator. Given this, I proposed an alternative analysis of free conditionals building on Rullman and Beck's (1998) analysis where *wh*-phrases are restricted variables and the question operator is responsible for providing a set of propositions, which is the meaning of a question (c.f. Hamblin, 1973; Kartunnen, 1976 and Rullman & Beck, 1998). As for the conditional analysis, I adopted Kratzer (1986) analysis where *if* clauses are restrictors to the operators in the structure. Moreover, adapting Heim's (1982) analysis of indefinites into FC readings of *wh*-conditionals, I assumed that universal modals can bind *wh*-variables. Furthermore, I also provided two different lexical entries for universal modals, one as a binder over individuals and worlds and the other as a binder only over the latter, like in regular ones. With those ingredients at hand, I claimed that in FC readings, the modal is a binder of worlds and individuals, therefore; it binds the variable introduced by the *wh*-phrase and we obtain an FC reading. In contrast, in the question readings, we make use of the regular modal and therefore, the question operator binds the *wh*-phrase and this results in the question reading. Therefore, we obtained the following two LF

structures for *wh*-conditionals like in (3) for a free conditional and a question reading respectively as in (5) and (6).

(5) [[Modal$_1$ [1 party who$_1$ come R$_7$ w* ]] then [s/he$_2$ has fun]]

(6) [?$_1$ [[Modal [1 party who$_1$ come R$_7$ w* ]]then [s/he$_1$ has fun]]

As a result, we obtained correct truth conditions for both readings. As for the difference between contingent and free readings in (3), in deictic readings, we had a deictic pronoun which is provided by the context. In contingent reading of a free conditional, I maintained an E-type analysis of Heim (1990) just as Demirok's. Therefore, in the latter, we were able to obtain the reading where the pronoun in the consequent clause varies depending on the *if*-clause. In contrast, in questions, we had co-binding of the *wh*-variable and the pronoun in the consequent, due to the fact that the question operator scopes over both of them. Furthermore, I also stated that assuming two lexical entries for modals as binders is a stipulation and there is a possible solution for this if we assume a pied-piping mechanism (c.f Demirok, 2017 and Charlow, 2017) in the question readings. Lastly, I showed that this analysis is more advantageous in that it doesn't lead to overgeneration since there is no assert operator in the structure and the pronoun binding in question readings are more straightforward.

In Chapter 4, I investigated *wh*-conditionals with overt existential modals as in (7).

(7)

| Parti-ye | kim | gel-se | eğlen-ebil-ir. |
|---|---|---|---|
| Party-DAT | who | come-sA | have-fun-PSB-AOR |

(i) FC: 'Whoever comes to the party might have fun.'

(ii) Question: 'Who$_1$ is such that if t$_1$ comes to the party and (s/)he$_1$ has fun?

I observed that the natural reading of FC readings involves a universal quantification of the *wh*-variable. As for the overt existential modal, its scope is restricted to that of the consequent sentence. Also, I provided some evidence for a silent universal modal determiner through the acceptability of NPI minimizers in the antecedents of such sentences in the spirit of Heim (1984). Given this, I revised the analysis in Chapter 3 and proposed a double-modal structure inspired to von Fintel and Iatridou (2005) analysis of anankastic conditionals. In this revised analysis, I assumed that the antecedent restricts a covert necessity modal in the structure, therefore; the *wh*-variable obtained a universal force, in line with its natural reading. I proposed the following LF in (8) for (7).

(8) [[must$_1$ [party 1 who$_1$ come ]] then [might s/he$_2$ has fun]]

Furthermore, to avoid the existential reading of such sentences, where an existential modal determiner binds the *wh*-variable, I assumed that only universal modals have the potential to bind both individual variables and worlds at the same time. I am aware that this is an ad hoc solution, yet this shows that the problem is technically fixable within the compositional semantics unlike the overgeneration problem that Demirok's (2017) analysis faces. As a limitation, as shown by von Fintel and Heim (2011), I stated that this analysis might have problems in capturing correct truth conditions for conditionals with epistemic flavors, due to the nested modality.

## 5.2 Further Research

The present analysis provides a novel compositional semantic analysis for *wh*-conditionals in Turkish. However, there are still a lot of issues to be discussed within the realm of *wh*-conditionals.

### 5.2.1 Non-modal behaving free conditionals

In this thesis, we focused on the *wh*-conditionals that have modal readings. However, *wh*-conditionals don't always have modal flavor in them. For instance, the following sentence in (9) actually asserts that Mary went to somewhere and Ali went to that place. Moreover, it is unambiguously a free conditional, lacking the question reading.

(9) Mary nere-ye git-ti-yse Ali ora-ya git-ti.
Mary where-DAT go-PST-ise Ali there go-PST

'Ali went to wherever Ayşe went'

The problem that (9) poses for this analysis is that it doesn't seem to have any modal determiner at all. For instance, it can be paraphrased as in (10).

(10) Ali went to the place that Mary went to.

The present analysis and Rawlins's (2013) analysis fail in explaining these kinds of sentences since both analyses adopt the view that *wh*- conditionals are conditionals and they always involve modals in them. When we look at the overt morphological markers in the structure, it is not strange to have non-modal readings. That is to say, on the surface, there is no modal marker, therefore, no modal reading arises. However, if we consider sentences with *ise* as conditional sentences, and maintain Kratzer's (1986) analysis, this requires that there be a covert universal modal in the structure. Hence, whether we can apply this analysis in such cases is an open question.

### 5.2.2 Implicatures in *wh*- conditionals

Remember that in Chapter 1, I showed that *wh*- conditionals are as productive as regular conditionals. That is, they can have different markers like *ise*, *-sA* and *-sAydI* which contribute different meanings. However, in this thesis, since my main concern

was to provide a general compositional analysis, I did not focus on the different types of *wh*-conditionals. This is another intriguing issue that needs further research. For instance, like conditional sentences as in (11), *wh*-conditionals can also be counterfactual (see (12)) and they carry similar implicatures.

(11) Ali parti-ye git-sey-di, eğlen-ir-di.
Ali party-DAT go-sA-PST have-fun-AOR-PST

'If Ali had gone to the party, he would have had fun.'

Implicature: The speaker knows that Ali didn't go to the party.

(12) Kim parti-ye git-se-ydi eğlen-ir-di.
Who party-DAT go-sA-PST have-fun-AOR-PST

(i) FC: 'Whoever had gone to the party would have had fun.'

(ii) Implicature: The speaker knows that for some value of the variable, there exists an individual such that when substituted to the variable in the *wh*-phrase, it makes it false.

(iii) Q: $\text{Who}_1$ is such that if $t_1$ had gone to the party then (s/)$\text{he}_1$ would have had fun?

(iv) Implicature: The speaker wants to know for which value of the variable there exists an individual such that when substituted to the variable in the *wh*-phrase, it makes it false.

The sentences in (11) and (12) show the implicatures that regular counterfactual conditionals and *wh*-conditionals have. Considering that they have similar implicatures, this actually gives support to the idea that *wh*-conditionals are conditionals. However, to account for such implicatures in a compositional way, one needs to go further into the implicatures in Turkish regular conditionals first.

## 5.3 Last remarks

This thesis provides a new perspective to the only previous analysis of *wh*-conditionals (Demirok, 2017) in Turkish. I showed that there is a way to analyze such sentences by adopting a different question semantics which avoids the problem of overgeneration. Also, this dissertation supports the idea that *wh*-conditionals are conditionals just as Demirok's (2017) and Rawlins's (2013) view.

# REFERENCES


Akar, D. (1990). *Wh-Questions in Turkish* (Unpublished manuscript), Boğaziçi University, İstanbul, Turkey.

Aoun, J., & Li, Y. H. A. (1993). *Wh*-elements in Situ: Syntax or LF?. *Linguistic Inquiry*, *24*(2), 199-238. Retrieved from https://www.jstor.org

Arslan, C. (1999). *Approaches to Wh-Structures in Turkish* (Unpublished manuscript). Boğaziçi University, İstanbul, Turkey.

Caponigro, I. (2003). Free not to Ask: On the Semantics of Free Relatives and Wh-words Crosslinguistically (Doctoral dissertation). Retrieved from https://ucsd.libguides.com/dissertations

Charlow, S. (2017). The scope of alternatives: Indefiniteness and islands. *Linguistic Inquiry and Philosophy*. Retrieved from lingbuzz/003302.

Cheng, L. L., & Huang, C. J. (1996). Two types of donkey sentences. *Natural Language Semantics*, *4*(2), 121-163. Retrieved from https://www.springer.com/gp

Ciardelli, I., Roelofsen, F., & Theiler, N. (2017). Composing alternatives. *Linguistics and Philosophy*, *40*(1), 1-36. Retrieved from https://www.springer.com/gp

Cole, P., & Hermon, G. (1994). Is there LF wh-movement?. *Linguistic inquiry*, *25*(2), 239-262. Retrieved from https://www.jstor.org

Condoravdi, C., & Lauer, S. (2016). Anankastic conditionals are just conditionals. Semantics & Pragmatics, 9(8), 1-69. Retrieved from http://kops.uni-konstanz.de

Demirok, Ö. (2017). A compositional semantics for Turkish correlatives. In A. Kaplan, A, Kaplan, M. K. McCarvel & E. J. Rubin (Eds.), *WCCFL 34: Proceedings of the 34th West Coast Conference on Formal Linguistics* (pp. 159-166). Somerville, MA: Cascadilla Proceedings Project.

Demirok, Ö. (2019). *Scope theory revisited: lessons from pied-piping in wh questions* (Doctoral dissertation). Retrieved from https://dspace.mit.edu

Evans, G. (1980). Pronouns. *Linguistic inquiry*, *11*(2), 337-362. Retrieved from https://www.jstor.org

von Fintel, K., & Heim, I. (2001). Topics in Semantics: Questions and Focus. Unpublished Lecture Notes, MIT.

von Fintel, K., & Iatridou, S. (2005). What to Do If You Want to Go to Harlem: Notes on Anankastic Conditionals and Related Matters. Manuscript. Retrieved from https://web.mit.edu/fintel/fintel-iatridou-2005-harlem.pdf

von Fintel, K., & Heim, I. (2011). Intensional semantics. Lecture Notes, MIT. Retrieved from https://citeseerx.ist.psu.edu/index

Göksel, A., & Kerslake, C. (2005). *Turkish: A comprehensive grammar*. London/Newyork: Routledge.

Göksel, A., Kelepir, M., & Üntak-Tarhan, A. (2009). Decomposition of question intonation: The structure of response seeking utterances. In J. Grijzenhout & B. Kabak (Eds.), *Phonological domains; universals and deviations* (pp. 249-286). Berlin, Germany: Walter de Gruyter.

Görgülü, E. (2006). *Variable wh-words in Turkish*. (Manuscript). Retrieved from http://seyhan.library.boun.edu.tr/record=b1420283~S5

Hamblin, C. L. (1973). Questions in Montague grammar. *Foundations of language*, *10*(1), 41-53. Retrieved from http://www.jstor.org

Heim, I. (1982). *The semantics of definite and indefinite noun phrases* (Doctoral dissertation). Retrieved from https://scholarworks.umass.edu/dissertations/AAI8229562

Heim, I. (1984). A note on negative polarity and downward entailingness. In C. Jones & P. Sells (Eds.), *Proceedings of North East Linguistics Society* (pp. 98-107). University of Massachusetts, Amherst.

Heim, I. (1990). E-type pronouns and donkey anaphora. *Linguistics and Philosophy 13*, 137–177. Retrieved from https://www.springer.com/gp

Heim, I., & Kratzer, A. (1998). *Semantics in generative grammar*. Malden, MA: Blackwell Publishers.

Hinterwimmer, S. (2008). *Q-adverbs as selective binders: The quantificational variability of free relatives and definite DPs.* Berlin, Germany: Mouton de Gruyter.

Hirsch, A. (2016). A compositional semantics for wh-ever free relatives. In *Proceedings of Sinn und Bedeutung* (pp. 341-358). Retrieved from https://semanticsarchive.net/sub2015/SeparateArticles/Hirsch-SuB20.pdf

Huitink, J. (2008). *Modals, conditionals and compositionality* (Doctoral dissertation). Retrieved from http://hdl.handle.net/2066/65613

Iatridou, S. (2013). Looking for free relatives in Turkish. In *Workshop in Altaic Formal Linguistics (WAFL) 8 Presentation* (pp. 129-152). University of Sttutgart, Sttutgart.

Karttunen, L. (1977). Syntax and semantics of questions. *Linguistics and philosophy*, *1*(1), 3-44. Retrieved from https://www.springer.com/gp

Kratzer, A. (1977). What 'must'and 'can'must and can mean. *Linguistics and philosophy*, *1*(3), 337-355. Retrieved from https://www.springer.com/gp

Kratzer, A. (1981). The notional category of modality. In H. J. Eikmeyer & H. Rieser (Eds.), *Words, worlds, and contexts: New approaches in word semantics* (pp. 38–74). Berlin, Germany: Walter de Gruyter.

Kratzer, A. (1986). Conditionals. *Chicago Linguistics Society 22*(2). 1–15.

Kratzer, A. (1991). Modality. In A. von Stechow & D. Wunderlich (Eds.), *Semantik: Ein internationales Handbuch der zeitgenossischen Forschung* (pp. 639-650). Berlin, Germany: Walter de Gruyter.

Kuruoğlu, G. (1986). Time reference in Turkish conditional sentences. In A. Aksu & E. E. Taylan (Eds.), *Proceedings of the Turkish Linguistics Conference* (pp. 59-75). İstanbul: Boğaziçi University.

Ladusaw, W. A. (1979). *Polarity Sensitivity as Inherent Scope Relations* (Doctoral Dissertation). Retrieved from: https://www.proquest.com

Lewis, D. (1979). Possible worlds. In M. J. Loux (Ed.), *The possible and the actual: Readings in the metaphysics of modality* (pp. 182-189). Ithaca: Cornell University Press.

Özsoy, A. S. (1996). A'-Dependencies in Turkish. In B. Rona (Ed.), *Current Issues in Turkish Linguistics*: *Proceedings of 5th ICTL* (pp.111-125). Ankara: Hitit Yayınevi.

Phillips-Brown, M. (2020). Anankastic conditionals are still a mystery. *Semantics and Pragmatics*, *12*(13), 1-17. Retrieved from https://semprag.org/index.php/sp

Rawlins, K. (2013). (Un) conditionals. *Natural language semantics*, *21*(2), 111-178. Retrieved from https://www.springer.com/gp

Reinhart, T. (1997). Quantifier scope: How labor is divided between QR and choice functions. *Linguistics and philosophy*, *20*, 335-397. Retrieved from https://www.jstor.org

Ross, J. R. (1967). *Constraints on Variables in Syntax* (Unpublished doctoral dissertation). MIT, Boston, Massachusetts, USA.

Rullmann, H., & Beck, S. (1998). Presupposition Projection and the Interpretation of 'which'-Questions. *Semantics and linguistic theory, 8,* 215-232. Retrieved from https://www.linguisticsociety.org

Sæbø, K. J. (2001). Necessary conditions in a natural language. In C. Féry & W. Sternefeld (Eds.), *Audiatur vox sapientiae: A Festschrift for Arnim von Stechow* (pp. 427–449). Berlin: Akademie-Verlagm. doi: 101515/9783050080116.427

Šimík, R. (2020). Free Relatives. In D. Gutzmann, L. Matthewson, C. Meier, H. Rullmann & T. Zimmermann (Eds.), *The Wiley Blackwell Companion to Semantics* (pp. 1-38). doi: 0.1002/9781118788516