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Free Not to Ask:

On the Semantics of Free Relatives and Wh-words Cross-linguistically

A dissertation submitted in partial satisfaction

of the requirements for the degree Doctor of Philosophy

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by

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Ai miei genitori Rosaria Facenda e Gerardo Caponigro,

il cui affetto, fiducia e sostegno

non sono mai venuti meno in questi anni,

qualunque cosa questo strano figlio facesse

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LIST OF CONVENTIONS

1:	first person
2:	second person
3:	third person
ACC:	accusative case
ADE:	adessive case
AUX:	auxiliary
CL:	clitic pronoun
COM:	comitative case
COMP:	complementizer
CONJ:	conjunction
CP:	complementizer phrase
DAT:	dative case
DEM:	demonstrative
DP:	determiner phrase
F:	feminine
FA:	function application
FR:	free relative clause
FUT:	future
HEAD:	the "head" of a relative clause, i.e. the constituent that a relative clause modifies
HR:	headed relative clause
IMP:	imperative
IMPERF:	imperfective
IND:	indicative
INE:	inessive case
INF:	infinitive
INT:	interrogative pronoun
IP:	inflectional phrase
LEX:	lexicon
M:	masculine
N:	neuter
NOM:	nominative case
NP:	noun phrase
P:	plural
PART:	partitive case

PM:	predicate modification
PP:	preposition phrase
PRES:	present
REFL:	reflexive pronoun
RP:	relative pronoun
S:	singular
SUBJ:	subjunctive
VP:	verb phrase
wh-INT:	wh-interrogative clause
λ-abstr:	lambda abstraction

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ABSTRACT OF THE DISSERTATION

Free Not to Ask:

On the Semantics of Free Relatives and Wh-words Cross-linguistically

by

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Doctor of Philosophy in Linguistics

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This dissertation investigates the question of the semantic contribution of wh-words like *who*, *what*, *where*, *when*, *how*, and their equivalents across languages. By looking at the cross-linguistic semantic behavior of non-interrogative wh-clauses known as free relatives, it is shown that wh-words do not behave like quantified or definite or indefinite expressions. Rather, their semantic contribution is that of restricting a set: they apply to the set denoted by the remaining part of the clause and return one of its subsets (*who* returns the subset of the entities that are animate, *what* the subset of the entities that are inanimate, etc.). Empirical support for this conclusion is presented from four kinds of free relatives: DP-like standard free relatives (e.g. *Jie ate* [*what Adam cooked*]), PP-like standard free relatives (e.g. *Captain Kirk went* [*where no one had gone before*]),

existential free relatives (e.g. from New York English: *I have* [*what to eat*] 'I have something to eat'), and *-ever* free relatives (e.g. *Jie eats* [*whatever Adam cooks*]). A compositional model-theoretic semantic analysis of DP-like standard free relatives and existential free relatives is given based on data from more than twenty languages from three different language families. Across languages, DP-like standard free relatives are analyzed as always referring to a maximal entity, as in Link's (1983) analysis of definite descriptions and Jacobson's (1995) analysis of free relatives in English. But, unlike those proposals, maximality is argued not to be lexically triggered, but to result from a default type-mismatch repairing strategy. Crucially, wh-words do not lexically encode maximality. Existential free relatives are analyzed as set-denoting expressions that are existentially closed by the matrix predicate. Therefore, wh-words do not lexically encode existential quantification. PP-like standard free relatives are shown to sometimes exhibit maximality, like DP-like standard free relatives (e.g. *I was born* [*where my parents were born*]), and other times not (e.g. *Captain Kirk went* [*where no one had gone before*]). The semantic properties of *-ever* free relatives are discussed in detail and an implementation of Dayal's (1997) proposal is given based on the assumption that wh-words act as set restrictors. Quantificational variability effects in free relatives are discussed as further empirical support for the main claim. Finally, it is shown how also Karttunen's (1977) influential proposal for interrogatives can be implemented if wh-words are assumed to behave as set restrictors. This dissertation shows that if the same wh-words can occur in wh-clauses that exhibit different semantic properties, then the wh-words themselves cannot be responsible for those semantic differences; moreover, their semantic

contribution must be compatible with the full range of meanings of wh-clauses.

Restricting a set is argued to be the required meaning for wh-words.

Wovon man nicht sprechen kann, darüber muß man schweigen.

'What we cannot speak about we must pass over in silence.'

(Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, Proposition 7)

INTRODUCTION

What is the semantic contribution of phrasal wh-words like *who*, *what*, *where*, *when*, *how*, and their equivalents across languages? The present work is an attempt to answer this not-so-unusual question in an unusual way.

Wh-words have been claimed to denote sets of entities (e.g. Hamblin 1973), to be existential quantified expressions (e.g. Karttunen 1977), to be ambiguous between existentially quantified and universally quantified expressions (e.g. Hintikka 1976), to behave like definite description (e.g. Jacobson 1995), or to introduce a free variable in the logical representation, like indefinites[1] (e.g. Nishigauchi 1986, 1990; Berman 1991, 1994; Ginzburg and Sag 2002). In other words, the entire semantic inventory for nominals has been suggested as the denotation of wh-words.

I believe the unpleasant heterogeneity of these proposals to be due to at least two main factors. First, the semantic behavior of wh-words has mainly been studied in interrogative clauses, about which our semantic intuitions are far from being sharp. For instance, it is basically impossible to paraphrase the embedded wh-interrogative *what Adam cooked* in the sentence *Jie wonders what Adam cooked* without making use of a wh-word. This shows that we do not have sharp intuitions about wh-interrogatives being semantic equivalent or very similar to other expressions in the language. Therefore, it is even harder to have intuitions about a subcomponent of wh-interrogatives, like wh-words.

Second, the semantic behavior of wh-words has mainly been studied within a language

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[1] At least under a ceratin view of indefinites (cf. Kamp (1981) and Heim (1982)).

at a time, which turned out to be English most of the time. This is problematic because it prevents us from distinguishing what is idiosyncratic and language-specific from what is truly general across languages in the semantic contribution of wh-words.

In the present work, I try to overcome these two factors by studying the semantic behavior of wh-words in free relative clauses (FRs) cross-linguistically. Like wh-interrogatives, FRs are introduced by *who*, *what*, *where*, *when*, *how*, and their equivalents across languages; but, unlike wh-interrogatives, we have clearer semantic intuitions about them. For instance, the FR *what Adam cooked* in the sentence *Jie ate what Adam cooked* can be easily paraphrased as *the thing(s) Adam cooked* or *the food Adam cooked*. Crucially, we have intuitions about what kinds of expressions in the language are truth-conditionally equivalent to FRs.

As for the cross-linguistic component of my approach, it has the advantage to allow us to distinguish what is general from what is language-specific. For instance, although all the three sentences in (1) are judged unacceptable in English because of the bracketed FRs, only b. and c. are unacceptable across languages, while the equivalent of a. is perfectly fine in other languages (e.g. Italian and Spanish).

(1) a. * [Who wants to marry me] lives around the corner.
     b. * I read [what book you read].
     c. * I did it [why YOU did it].

What we conclude by looking at the semantic behavior of FRs cross-linguistically is that the semantic contribution of wh-words is the one of restricting a set: they apply to a set and return one of its subsets. The set that wh-words apply to always results from λ-abstracting over the variable that is introduced in the logical representation by the

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wh-trace. For instance, *what* in *Jie ate* [*what Adam liked* t] applies to the set of entities that Adam liked and returns the subset of inanimate entities that Adam liked. The set of things that Adam liked results from λ-abstracting over the variable introduced by the wh-trace t.

Here is a brief summary of how I reach this conclusion. In Chapter 1, I give a precise definition of FR, which is more restrictive than what is usually assumed in the literature. Crucially, it requires FRs to be always introduced by wh-words, i.e. words that can also introduce interrogatives. With this definition in hand, I have been able to find FRs in at least twenty eight different languages from three language families, and this counting is by no means exhaustive. Once I establish that the cross-linguistic pattern is large and robust, I move to discuss the semantic behavior of FRs.

In Chapter 2, I look at DP-like standard FRs (e.g. *Jie ate* [*what Adam cooked*]) and I argue that they semantically behave like definite DPs. In other words, DP-like standard FRs denote a maximal entity, according to the definition of maximal entity in Link (1983). This is basically the proposal that is put forward in Jacobson (1995) for English FRs.[2] My main contribution is to show that it holds cross-linguistically.

I also add three new arguments to the ones in Jacobson (1995) in order to support the similarity between DP-like FRs and definite DPs. First, I show that DP-like standard FRs can never refer to any other entity smaller than the maximal one, even in a situation in which the non-maximal reading would be strongly preferred. Second, I show that it is cross-linguistically true that DP-like standard FRs can always be replaced and

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[2] Dayal (1996) makes a closely related proposal for correlative in Hindi.

paraphrased with definite DPs or any other expressions that denote a maximal entity. Third, I show that DP-like standard FRs pattern like definite DPs and unlike the other kinds of DP as far as quantificational variability effects with adverbs of quantity like *for the most part* are concerned.

In Chapter 3, I discuss existential FRs. I first show that they are introduced by the same wh-words as DP-like standard FRs and are found in all languages that have DP-like standard FRs, with the exception of most Germanic languages. An example of an existential FR in Italian is given in

(2) Non ho [FR chi   mandare alla   conferenza].
      not   have.1S who to-send   to-the conference
      'I don't have anybody to send to the conference.'

I then argue that existential FRs never denote an entity, but rather a set of entities. I give two arguments in favor of this conclusion. Existential FRs can never be replaced with definite DPs or their equivalents, which are the entity-denoting expressions by definition. Also, existential FRs do not pattern like definite DPs and DP-like standard FRs as far as quantificational variability effects with adverbs of quantity are concerned, but rather they exhibit the same behavior as (existentially) quantified DPs.

In conclusion, the cross-linguistic study of DP-like standard FRs and existential FRs clearly shows that they behave in two different way semantically. Since these FRs are introduced by the same set of wh-words, wh-words themselves cannot be responsible for the semantic differences between these FRs. Moreover, the semantic contribution of wh-words must be such to be compatible with the semantic properties of both DP-like standard FRs and existential FRs. Therefore, wh-words cannot be existentially quantified

expressions or universally quantified expressions, otherwise DP-like standard FRs could not end up denoting a maximal entity. Similarly, wh-words cannot be like definite descriptions, otherwise existential FRs would not be expected to semantically behave like they do. Finally, wh-words cannot denote set of entities, otherwise it would be impossible to derive any DP-like denotation for any FRs. I conclude that a correct account for the semantic behavior of FRs can be given only if wh-words are assumed to introduce a free variable in the logical representation.

A compositional semantics for DP-like standard FRs and existential FRs based on the assumption that wh-words act as set restrictors is elaborated in Chapter 2 and Chapter 3 respectively. In brief, my analysis makes DP-like standard FRs and existential FRs very similar, at least up to a certain point. Syntactically, they are both CPs. Semantically, they both end up denoting a set of entities after the wh-word is combined with the rest of the FR. At this point, their semantic derivations diverge. DP-like standard FRs turned from denoting a set to denoting its maximal entity. I argue that this is the optimal way to the preserve as much information as possible while solving the type-mismatch between the matrix predicate, which selects for an entity-denoting expression, and the DP-like standard FR, which originally denotes a set of entities.

As for existential FRs, they are existentially closed by the existential quantifier that I assume is lexically introduced by the matrix predicate. This explains their very restricted distribution as complements of existential predicates and their semantic behavior similar to the ones of existentially quantified expressions.

Although similarities and differences between DP-like standard FRs and

existential FRs are more than enough to support the conclusions about the semantic contribution of wh-words I argue for in the present work, I also discuss two more cases of FRs that point at the same direction, though I do not give a compositional semantics for them: PP-standard FRs and *-ever* FRs. PP-standard FRs are discussed in Chapter 3 as an example of a FR that is found in English as well that may or may not exhibit maximality (e.g. *Captain Kirk went* [*where no man had gone before*]).

-ever FRs (e.g. *Jie eats* [*whatever Adam* cooks]) are discussed in Chapter 4. After describing their properties in details, I introduce the proposal in Dayal (1997). Although this is the most comprehensive and elegant proposal about *-ever* FRs I am aware of, I tentatively argue that if we follow Dayal (1997) and assume that the semantic contribution of *-ever* FRs is compositionally derived from wh-words whose lexical meaning incorporates maximality we may end up making unexpected and problematic prediction. Once again, a characterization of wh-words as set restrictors seems to fit the semantic behavior of FRs better.

The last chapter, Chapter 5, is devoted to a comparison of the quantificational variability effects of different kinds of FRs under adverbs of quantification. Their behavior is compared with the one of different kinds of DPs and the results give further support to the conclusions I reached in the previous chapters: DP-like standard FRs behave like definite DP, while existential FRs and *-ever* FRs behave like quantified expressions.

CHAPTER 1

Free Relatives: Definition and Cross-linguistic Distribution

Wh-clauses that look like (embedded) **wh-interrogatives** (**wh-INTs**) can occur in non-interrogative contexts in English. For instance, *what Adam cooked* is the complement of the non-interrogative predicate *taste* in (1a), while it is the complement of the interrogative predicate *wonder* in (1b). Intuitions are clear that the two wh-clauses are not semantically equivalent. Unlike (1b), *what Adam cooked* in (1a) can be replaced and paraphrased with a DP like *the thing(s) Adam cooked* (cf. (1c)).

(1) a. I tasted [what Adam cooked].
     b. I wonder [wh-INT what Adam cooked].
     c. I tasted [DP the thing(s) Adam cooked].

Non-interrogative wh-clauses like *what Adam cooked* in (1a) have been called **free relatives** (**FRs**):[1] "relatives" because their distribution and interpretation has been felt to be somehow similar to **headed relatives** (**HRs**);[2] "free" because they lack the overt HEAD[3] that always precedes HRs (cf. (2)).[4]

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[1] Ross (1967: 38 [1983: 20]) is the earliest work where I have found the term *free relatives* mentioned, although Ross's words seem to presuppose an even earlier origin: "the type of clause which have been called 'free relative clause' ".

[2] Throughout this work, only restrictive headed relatives are considered and the acronym *HRs* is always meant to refer just to those.

[3] Henceforth, HEAD will be used to refer to the constituent that precedes a HR and that the HR modifies. This is to avoid confusion with the notion of "head" of a phrase.

[4] FRs are sometimes called *headless relatives*. This is somehow confusing since the same term is sometimes used to refer to a different construction, i.e. internally headed relative clauses (e.g. Cole *et al.* 1978; Cole 1979).

(2) a. I tasted [$_{FR}$ what Adam cooked].
     b. I tasted [$_{DP}$ the [$_{HEAD}$ thing(s)] [$_{HR}$ that Adam cooked]].

FRs are not limited to wh-clauses with *what*. They can also be introduced by other phrasal wh-words[5] like *who*, *where*, *how* and *when*:

(3) a. I'll marry [$_{FR}$ who you choose].[6]
     b. You can't smoke [$_{FR}$ where the kids are playing].
     c. I left [$_{FR}$ when Flavio arrived].
     d. I did it [$_{FR}$ how you did it].[7]

The purpose of this initial chapter is to give a precise definition of FRs, to show how they can be distinguished from wh-INTs and HRs when they look identical, to present cross-linguistic data that show that FRs are not just an idiosyncrasy of English, and finally to draw some conclusions about FRs, wh-INTs, HRs, and their wh-words on the basis of the cross-linguistic patterns we have found. This will set the empirical stage for the next chapter, where a semantic analysis of FRs and wh-words will be developed.

1.1. Free relatives: a definition

Let us start with a definition that identifies all and only those constructions that will be called FRs throughout this work.

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[5] I use 'phrasal wh-words' to refer to all single wh-words that can form a maximal projection (DP or PP) by themselves, without any further lexical material. For instance, *who*, *where*, *when* and *why* are always phrasal wh-words in English, while *what* and *how* can be phrasal wh-words or not. I assume that *which* is never a phrasal wh-word: it always takes an NP complement, which can sometimes be covert when recoverable from the context.

[6] The acceptability of (3a) varies across speakers from perfectly acceptable to slightly marginal.

[7] According to my consultants, (3d) must be uttered with contrastive stress on *I* and *you* to sound perfectly acceptable.

(4) *Definition of FRs*

　　FRs are all and only those strings that satisfy the following properties:

　　　a. they contain a wh-word, or a morphologically complex word with a wh-word as its root (*lexical property*);

　　　b. they are clauses with a gap (*syntactic property*);

　　　c. they can always be replaced with truth-conditionally equivalent DPs or PPs (*semantic property*).

The lexical property in (4a) requires a FR to contain either a wh-word, i.e. a word that occurs and characterizes a wh-INT as such, or a morphologically complex word like *whatever* in English or *óti* (*ó-ti* 'what' in FRs, but lit. 'the-what') in Modern Greek, which have a wh-word as their root. The syntactic property in (4b) requires a FR to be a clause with a gap. Therefore, the sentence *You can do whatever* is not a FR because it does not have a gap, though it contains whatever and satisfies the lexical property. Veneeta Dayal correctly pointed out to me that a language with wh-situ that have FRs may not have a gap. On the other hand, I have not yet found such a language. Finally, the semantic property in (4c) requires a FR to be replaceable and truth-conditionally equivalent to a DP or a PP. Notice that the DP or PP that replaces a FR does not need to occur in exactly the same syntactic position: distributional differences between FRs and DPs have been observed: for instance, FRs can occur postverbally in Dutch and German, while DPs usually cannot (Groos and van Riemsdijk 1981)

The bracketed string in (1a) above, repeated here as (5a), is a FR, according to the definition in (4): it contains the wh-word *what*, it has a main predicate *cooked* with a gap in its complement position, and it can be replaced and paraphrased with the bracketed DP in (5b).

(5) a. I tasted [what Adam cooked].
     b. I tasted [$_{DP}$ the food/things Adam cooked].

Similar considerations apply to all the examples in (3) above, which have been repeated in (6). Each bracketed string in (6) is immediately followed by the result of replacing it with a truth-conditionally equivalent DP or PP.

(6) a. I'll marry [$_{FR}$ who you choose].
     a'. I'll marry [$_{DP}$ the person you choose].
     b. You can't smoke [$_{FR}$ where the kids are playing].
     b'. You can't smoke [$_{PP}$ in the places where the kids are playing].
     c. I left [$_{FR}$ when Flavio arrived].
     c'. I left [$_{PP}$ at the same time that Flavio arrived].
     d. I did it [$_{FR}$ how you did it].
     d'. I did it [$_{PP}$ in the way you did it].

Notice that, according to the definition in (4), the bracketed strings in (7a) and (7b) are not FRs, though they look like non-interrogative wh-clauses. In fact, replacing the FR with a DP gives rise to the unacceptable sentences in (7a') and (7b') (which should be read without any pause between *that* or *he* and the following DP).

(7) a.   I ate that [which Adam cooked].
     a'.* I ate that [$_{DP}$ the food Adam cooked].
     b.   He [who doesn't sleep enough] feels tired.
     b'.* He [$_{DP}$ the person who doesn't sleep enough] feels tired.

The bracketed strings in (7a) and (7b) are just HRs whose heads are determiner-like elements rather than nominal ones.[8]

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[8] These HRs have been called *semi-free relatives* (Smits 1989) or *false free relatives* (de Vries 2002).

1.2. Free relatives and wh-interrogatives

FRs can look identical to wh-INTs:

(8) a. I wonder [wh-INT what Adam cooked].
    a'. I ate [FR what Adam cooked].
    b. I wonder [wh-INT who you will choose].
    b'. I'll marry [FR who you choose].
    c. I wonder [wh-INT where the kids are playing].
    c'. You can't smoke [FR where the kids are playing].
    d. I wonder [wh-INT when Flavio arrived].
    d'. I left [FR when Flavio arrived].
    e. I wonder [wh-INT how you did it].
    e'. I did it [FR how you did it].

Nevertheless, intuitions are clear that FRs and wh-INTs have different semantic properties. Some tests can help to make these intuitions explicit.

Test 1: Substitution. Wh-INTs can be replaced by **yes/no interrogatives** (**y/n-INTs**) introduced by *whether*, while FRs usually cannot. On the other hand, as we saw above, FRs can always be replaced with truth-conditionally equivalent DPs or PPs, while wh-INTs usually cannot. More generally, wh-INTs always occur as arguments of interrogative predicates, while FRs are either arguments of non-interrogative predicates or adjuncts. For instance, the FR *what Adam cooked* (9a) can be replaced by the DP *the food Adam cooked* (9b), but not by the y/n-INT *whether Adam cooked risotto* (9c), whereas the identical wh-INT (10a) exhibits the opposite substitution pattern (10b-c). All the other examples given above behave similarly.

(9) a. I ate [FR what Adam cooked].
    b. I ate [DP the food Adam cooked].
    c.*I ate [y/n-INT whether Adam cooked risotto].

(10) a. I wonder [wh-INT what Adam cooked].
    b.*I wonder [DP the food Adam cooked].
    c. I wonder [y/n-INT whether Adam cooked risotto].

It is true that an interrogative predicate like *wonder* can have its wh-INT complement replaced with a PP introduced by *about*, as shown in (11).

(11) a. I wonder [wh-INT what Adam cooked].
    b. I wonder [PP about the food Adam cooked].

Nevertheless, (11a) and (11b) are not truth-conditionally identical. If I know what food Adam cooked, I can no longer wonder what he cooked, but I can still wonder about what he cooked.

Notice that there are predicates like *know* that can select for both interrogative and non-interrogative complements. (12a) is genuinely ambiguous between a reading according to which I don't know the answer to the question *What did Adam cook?* and a reading according to which I am making the claim that I am not familiar with the kind of food Adam cooked. This is due to a lexical ambiguity of the predicate *know*, which explains why *know* can be followed by either a yes/no interrogative (12b) or a non-interrogative DP (12c).

(12) a. I don't know [wh-INT/FR what Adam cooked].
    b. I don't know [y/n-INT whether Adam cooked risotto].
    c. I don't know [DP the food Adam cooked].

Other languages like Italian, German and Spanish express the meanings of "be able to answer" and "be acquainted with" by means of two different lexical items.

Although the substitution test and, more generally, the definition in (4) are successful most of the time, exceptions are found. Verbs of sensation like *taste* or *smell* can take

either a FR or a *whether*-clause as their complement (13a),[9] while interrogative predicates like *guess* or *tell* can take either a wh-INT or a DP as their complement, with the DP being interpreted as a "concealed question"[10] (13b).

(13) a. Taste   [FR what Adam cooked]!
                    [y/n-INT whether Adam put enough salt in the soup]!
      b. Tell me   [wh-INT how old you are]!
                      [DP your age]!

   Test 2: Question formation. Baker (1968: 9-11) reports the following test by Jespersen (1909-49: III) to distinguish FRs and wh-INTs. When a wh-INT is itself questioned, the wh-word employed is always *what*, no matter which wh-word introduces it (cf. (14)[11]). On the other hand, a FR can always be questioned by means of a wh-INT introduced by the same wh-word (cf. (15)[12]).

(14) a.   John knows [wh-INT **where** the Cottonwood river joins the Neosho].
      b. * **Where** does John know?
      c.   **What** does John know?

(15) a.   John lives [FR **where** the Cottonwood river joins the Neosho].
      b.   **Where** does John live?
      c. * **What** does John live?

   Given its nature, this test fails to distinguish between wh-INTs and FRs when they are both introduced by *what*:

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[9] Thanks to Carson Schütze for pointing out this piece of data.

[10] The term *concealed question* for this kind of nominal is due to Baker (1968), who has an extensive discussion of the issue in Ch. 6. See also Grimshaw (1977: Ch. 6).

[11] Example from Baker (1968: p. 10, ex. 2.4-2.6).

[12] Example from Baker (1968: p. 10, ex. 2.7-2.9).

(16) a.   Jie asked [wh-INT **what** Adam cooked].
     b.   **What** did Jie ask?

(17) a.   Jie ate [FR **what** Adam cooked].
     b.   **What** did Jie eat?

Test 3: wh-word + *else***.** Ross (1967: 38 [1986: 20]) observes that the word *else* can

appear after the wh-word in wh-INTs, while it cannot in FRs:

(18) a.   I wonder [wh-INT what **else** Adam cooked].
     a'.   I wonder [wh-INT where **else** Adam has been].
     b. * I tasted [FR what **else** Adam cooked].
     b'. * I went [FR where **else** Adam has been].

On the other hand, some of my consultants find wh-INTs with *how else* marginal (19a)

and most of them find wh-INTs with *when else* either marginal or unacceptable (19b):

(19) a.   % Trust me: she certainly knows [wh-INT how else we could do it].
     b.   % I wonder [wh-INT when **else** we could go there].

Test 4:   wh-word + *the hell***.** McCawley (1998: 456) notices that the wh-words in

wh-INTs can be followed by expressions such as *the hell*, while FRs cannot.

(20) a.   I wonder [wh-INT what **the hell** Adam cooked].
     b. * I tasted [FR what **the hell** Adam cooked].

On the other hand, some wh-INTs do not pass the test either (cf. den Dikken and

Giannakidou (2001):

(21) a. * I know [wh-INT where **the hell** she wants to go on vacation].
     b. * Sara found out [wh-INT why **the hell** Massimo didn't show up].

Variants of the sentences in (21) with negation or future tense in the matrix clause are

judged more acceptable:

(22) a. I <u>don't</u> know [_{wh-INT} where **the hell** she wants to go on vacation].
　　b. Sara <u>will</u> surely find out [_{wh-INT} why **the hell** Massimo didn't show up].

Although none of the tests above is infallible, when applied together, they can always distinguish FRs and wh-INTs for our purposes. More on the differences between these constructions can be found in Baker (1968: Ch. 2).

1.3. Free relatives and headed relative clauses

FRs can look like HRs in English:

(23) a. I'll marry [_{FR} who you choose].
　　a'. I'll marry the person [_{HR} who you choose].
　　b. You can't smoke [_{FR} where the kids are playing].
　　b'. You can't smoke in the room [_{HR} where the kids are playing].
　　c. I left [_{FR} when Flavio arrived].
　　c'. I left at the time [_{HR} when Flavio arrived].

FRs can be easily distinguished from HRs by means of their semantic property (cf. (4c)). They can always be replaced and paraphrased with a DP or a PP, while HRs never can. (24) shows this contrast with the examples in (23a) above. The FR can be replaced with a DP (24b), while the HR cannot (24a).

(24) a.　　I'll marry the person　[_{HR} who you choose]
　　　　　　　　　　　　　　*[_{DP} the person you choose].
　　b.　　I'll marry　　[_{FR} who you choose]
　　　　　　　　　　[_{DP} the person you choose].

The same contrast holds for the remaining FRs and HRs in (23b-c).

1.4. Free relatives cross-linguistically

1.4.1. Cross-linguistic distribution of free relatives

FRs, that is constructions that satisfy the definition in (4), are not an idiosyncrasy of English. They are attested in many languages from several language families. So far I have found them in the languages listed in Table 1 below. Only languages that are still spoken have been included. I have access to native speakers of all the languages listed below except for Albanian and Sardinian.

Table 1. Languages where I have found FRs so far

```
INDO-EUROPEAN:        GERMANIC:   Bavarian
                                  Dutch
                                  Standard English
                                  New York English
                                  Standard German
                                  Swiss German
                                  West Flemish
                                  Yiddish

                       ROMANCE:   Catalan
                                  French
                                  Italian
                                  European Portuguese
                                  Brazilian Portuguese
                                  Romanian
                                  Sardinian
                                  Spanish

                        SLAVIC:   Bulgarian
                                  Macedonian
                                  Polish
                                  Russian
                                  Serbo-Croatian
                                  Slovenian

                    Albanian
                    Modern Greek


FINNO-UGRIC:  Estonian
              Finnish
              Hungarian

SEMITIC:   Modern Hebrew
           Modern Moroccan Arabic
```

Notice that the definition of FR adopted here (cf. (4)) is more restrictive than what is usually found in the literature. For instance, Ramos-Santacruz (1994) and

Gutiérrez-Rexach (1999, 2002) call Spanish constructions like the bracketed one in (25) FRs, while they cannot be FRs according to our definition since they do not contain a wh-word.

(25)   [Lo que Pedro vio] due incredible.[13]
        the that Pedro saw was incredible
        'What Pedro saw was incredible.'

There are at least two reasons for being so restrictive, a theoretical one and a practical one. Theoretically, constructions like the bracketed one in (25) look like a HEAD+HR string: they are introduced by a HEAD (the neuter determiner *lo* in (25)) that is immediately followed by an element that introduces HRs (the complementizer *que* in (25)). The only difference with usual HRs is that the HEAD is a determiner rather than a noun. English has similar HRs as well. In the examples in (26), the determiner-like elements *those* and *that* are immediately followed by a HR.

(26)   a. [[HEAD Those] [HR who were against the war]] were all arrested.
        b. [[HEAD That] [HR which you just said]] doesn't make much sense.

Notice that neither of the bracketed strings I labeled HR in (26) could form an acceptable FR according to our definition, as shown in (27).

(27)   a.*[Who was/were against the war] was/were (all) arrested.
        b.*[Which you just said] doesn't make much sense.

In conclusions, constructions like the ones in (25) in Spanish and (26) in English always have a HEAD and, crucially, their HEAD is always followed by a relative pronoun or any other element that introduces usual HRs as well. As we will soon see,

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[13] Gutiérrez-Rexach (2002: 120, ex. 28a).

FRs are not introduced by the same elements that introduce HRs in many languages. I take this as evidence that FRs and constructions like the one in (25) and (26) do not form a natural class and should not be grouped together.

The practical reason for being so restrictive is that one of the main goals of the present work is to use FRs to investigate the semantic behavior of wh-words in general. FRs without wh-words would not be of any help for this purpose. Both reasons will be discussed in much more detail at the end of this chapter, after presenting the cross-linguistic data.

1.4.2. Cross-linguistic data

Examples are given below of wh-INTs, FRs and HRs cross-linguistically. The data from five of the languages with FRs mentioned above are given in the main body of this chapter, while I have grouped the examples from the remaining languages in Appendix 1, for the sake of readability. Some conclusions on the cross-linguistic distribution of wh-words are presented and discussed at the end of this chapter in § 1.5.

The data below and the data in the appendix are presented in the same format. For each language, six triples of examples are given. The first example of each triple (a.) contains a wh-INT, the second example (b.) contains the identical FR (or the closest one in form) whenever the language allows such a FR to be formed, and finally the third example (c.) contains a HR that is (almost) identical in meaning and as close as possible in form to the preceding FR, if such a FR is attested in the language.

For each language, the wh-INT of the first triple is introduced by the equivalent of *who* in that language, the second triple by the equivalent of *what*, the third triple by the

equivalent of *where*, the fourth triple by the equivalent of *when*, the fifth triple by the equivalent of *how*, and finally the sixth triple by the equivalent of *why*. A table summarizes the distribution of wh-words in wh-INTs, FRs and HRs right below the data.

Remarks about general properties of that language or wh-INTs, FRs or HRs in that language precede the data as *General comments*. More specific remarks have been added below the data as *Specific comments*.

The complementizer that can introduce HRs in many languages is glossed as COMP. Pronominal forms that can occur only in HRs, but not in wh-INTs and FRs, are glossed RP (Relative Pronoun). Language-specific conventions for glosses are mentioned right before presenting the data. Morphological marking for gender, number and/or case has not been glossed unless relevant. A list of conventions is given right after the acknowledgments.

1.4.2.1 A Germanic language: English

General comments. Below I have grouped the data I discussed earlier in order to evidenciate similarities and differences. English exhibits a large overlap between the elements that introduce wh-INTs, FRs, and HRs, with some interesting asymmetries. All phrasal wh-words that introduce wh-INTs can introduce FRs as well, except for *why*. On the other hand, only *why*, *when* and *where* can introduce also HRs, while *what* and *how* cannot. So, wh-INTs and FRs pattern almost alike, as far as wh-words are concerned, while HRs exhibit more differences.

What about w*hich*? It can occur in wh-INTs and HRs, but not in FRs. I believe that the different restrictions that the two uses of *which* display show that we are dealing with

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homonyms. *Which* in HRs requires an inanimate antecedent in Standard English and cannot take a DP complement; *which* in wh-INTs does not have any animacy restriction and requires an overt DP complement (which can be optionally silent if recoverable from the context). As we will discuss later on, FRs ban complex wh-phrases in general. Therefore, it is expected for the *which* that occurs in wh-INTs not to occur in FRs, since it always forms a complex wh-phrase by requiring a DP complement.

Another case in which the similarity between wh-INTs and FRs seems to break down is with *why*, which can introduce wh-INTs, but not FRs. This is cross-linguistically true. On the other hand, the use of *why* to introduce HRs seems to be more language specific.

(28) *who*
    a. I wonder [wh-INT **who** you will choose].
    b. I'll marry [FR **who** you choose].
    c. I'll marry the person [HR **who** you choose].

(29) *what*
    a. I wonder [wh-INT **what** Adam cooked].
    b. I tasted [FR **what** Adam cooked].
    c. I tasted the food [HR *__**what**[14]__/**which**/**that** Adam cooked].

(30) *where*
    a.. I wonder [wh-INT **where** the kids are playing].
    b. You can't smoke [FR **where** the kids are playing].
    c. You can't smoke in the places [HR **where** the kids are playing].

(31) *when*
    a. I wonder [wh-INT **when** Flavio arrived].
    b. I left [FR **when** Flavio arrived].
    c. I left at the time [HR **when** Flavio arrived].

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[14] Some nonstandard varieties of English use *what* in HRs: e.g. some Southern US dialects (Harold Torrence p.c.), dialects spoken in the Southern Appalachians and in the Ozark Mountains of Arkansas and Missouri (Bruce Hayes p.c.), and Working Class London English (Ed Keenan, Peter Ladefoged and Tim Stowell p.c.).

(32) *how*

    a. I wonder [_{wh-INT} **how** you did it].

    b. I did it [_{FR} **how** you did it].[15]

    c. I did it in the way [_{HR} ***how**/**that** you did it].

(33) *why*

    a. I wonder [_{wh-INT} **why** you did it].

    b.*I did it [_{FR} **why** you did it].

    c. The reason [_{HR} **why**/?**that** you did it] is obvious.

Table 2. Distribution of wh-words in English

	who	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√/*	√	√	√	√	*
HRs	√	*	√	√	*	√

Specific comments. **Who**. FRs introduced by *who* are restricted in English. Most (but not all) speakers find them unacceptable when *who* signals a missing subject, no matter what syntactic position the FR occupies inside the matrix clause (34a-b). They improve remarkably when *who* signals a missing complement (34c-e).

(34) a. ?? [Who doesn't sleep enough] feels tired the following morning.

    b. ?? I admire [who works hard].

    c. I will marry [who you choose].

    d. You are not gonna meet [who I am going out with].[16]

    e. Abu Dhabi TV also released a separate audiotape of [who they claimed to be Saddam].[17]

1.4.2.2 A Romance language: Italian

General comments. In Italian, the wh-words *chi* 'who', *quando* 'when', and *come* 'how'

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[15] My consultant told me that (32b) must be uttered with contrastive stress on *I* and *you* in order to sound fully acceptable.

[16] From *7th Heaven,* episode: *Monkey Business-Part 1*, originally aired on WB on 9/16/02 (thanks to Carson Schütze for pointing this out).

[17] CNN News on 04/18/03 (thanks to Carson Schütze for pointing this out).

can introduce both wh-INTs and FRs, but not HRs. *Dove* 'where' can introduce all three

clause types. *Che cosa* 'what' can introduce only wh-INTs, but its reduced variant *cosa*

can occur in FRs as well, though there is variation among speakers (see the discussion in

Specific comments below).

(35) *who*
    a. Dimmi [wh-INT **chi /*che**   lavora duramente].
        tell-me   who/*COMP works hard
        'Tell me who works hard.'
    b. Ammiro [FR **chi /*che**   lavora   duramente].
        admire.1SG who/*COMP works   hard
        'I admire those who work hard.'
    c. Ammiro   le persone [HR ***chi /che**   lavorano   duramente].
        admire.1SG the people   *who/COMP work   hard
        'I admire the people who work hard.'

(36) *what*
    a. Dimmi [wh-INT **che cosa/*che**   hai   cucinato].
        tell-me   what thing/*COMP have.2S cooked
        'Tell me what you cooked.'
    b. Ho   assaggiato [FR ***che cosa /*che**   hai   cucinato].
        have.1S tasted   *what thing/*COMP have.2S cooked
        ('I tasted what you cooked.')
    c. Ho   assaggiato il cibo [HR ***che cosa /che**   hai   cucinato].
        have.1S tasted   the food   *what thing/COMP have.2S cooked
        'I tasted the food you cooked.'

(37) *where*
    a. Non so   [wh-INT **dove**   sono nati i   miei genitori].
        not know.1S   where are born the my   parents
        'I don't know where my parents were born.'
    b. Sono nato [FR **dove**   sono nati i   miei genitori].
        am   born   where are born the my   parents
        'I was born where my parents were born.'
    c. Sono nato nello stesso paese [HR **dove**   sono nati i   miei genitori].
        am   born in-the same town   where are   born the my   parents
        'I was born in the same town where my parents were born.'

(38) *when*

    a. Ti   ho   chiesto [_{wh-INT} **quando/*in cui** è arrivato Flavio].

       to-you have.1S asked   when /*in RP is arrived Flavio

       'I asked you when Flavio arrived.'

    b. Sono partito [_{FR} **quando/*in cui** è arrivato Flavio].

       am   left   when /*in RP is arrived Flavio

       'I left when Flavio arrived.'

    c. Sono partito nel   momento [_{HR} ***quando/in cui** è arrivato Flavio].

       am   left   in-the moment   *when /in RP is arrived Flavio

       'I left at the time when Flavio arrived.'

(39) *how*

    a. Dimmi [_{wh-INT} **come/*in cui** l'hai   fatto tu].

       Tell-me   how /*in RP it-have.2S done you

       'Tell me how you did it.'

    b. L'ho   fatto [_{FR} **come/*in cui** l'hai   fatto tu].

       it-have.1S done   how /*in RP it-have.2S done you

       'I did it how you did it.'

    c. L'ho   fatto nel   modo [_{HR} ***come/in cui** l'hai fatto tu].

       it-have.1S done in-the way   *how /in RP it-have.2S done you

       'I did it in the way you did it.'

(40) *why*

    a. Dimmi [_{wh-INT} **perché**/***per cui** l'hai   fatto].

       Tell-me   why /*for RP it-have.2S done

       'Tell me why you did it.'

    b. L'ho fatto [**perché**/***per cui** l'hai   fatto tu].

       it-have.1S   why/*for RP it-have.2S done you

       'I did it because you did it.'

       (cannot mean: 'I did it for the same reason why you did it.')

    c. L'ho fatto per il   motivo [_{HR} ***perché**/**per cui** l'hai   fatto tu].

       it-have.1S for the reason   *why /for RP it-have.2S done you

       "I did it for the same reason why you did it.'

Table 3. Distribution of wh-words in Italian

	who	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√	*/√	√	√	√	*
HRs	*	*	√	*	*	*

Specific comments. **What.** As shown in (36b), Italian does not allow FRs (nor HRs) with

che cosa 'what'. This may be due to the complex nature of *che cosa*, which is literally 'what thing'. Unlike phrasal wh-words, wh-words that are part of more complex wh-phrases are usually not acceptable in FRs crosslinguistically: e.g. *I read what* (**book*) *you read*. In Italian, the reduced form *cosa* can be used with the same meaning as *che cosa* in wh-interrogatives without any distributional differences, as far as I can tell:

(41) a. **(Che) cosa** vuoi   mangiare   stasera?
         what   thing want.2S   eat.INF   tonight
         'What do you want to eat tonight?'
    b. Ti   ho   chiesto **(che) cosa** non ti   piace   di me.
        to-you.CL   have.1S asked   what thing not to-you.CL   pleases of me
        'I asked you what you don't like about me.'

On the other hand, FRs can never be introduced by *che cosa*, while FRs can be introduced by *cosa*, though there is variation among the speakers. They are colloquial and slightly marginal for me, but still definitely better than FRs with *che cosa*; Acquaviva (1989) and speakers from Turin find them fully acceptable.[18]

Why. *Perché* 'why' can introduce wh-INTs like (40a) and clauses like (40b). Despite satisfying most of the requirements, (40b) is not a FR. It is a clause with a wh-word and can be replaced with a PP. Nevertheless, it has no gap, neither in argument nor in adjunct position. (40b) does not say that you did what you did for any particular reason; it only says that the reason why I did it was because you did it.

1.4.2.3 A Slavic language: Polish

General comments. All phrasal wh-words can introduce both FRs and wh-INTs in Polish,

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[18] Thanks to Emanuela Arosio for pointing this out to me and collecting the data.

except *dlaczego* 'why'. *Gdzie* 'where', *kiedy* 'when', and *jak* 'how' can also introduce

HRs.[19] *Ktorzy* introduces only HRs and can occur with either animate or inanimate heads.

(42) *who*

    a. Powiedz mi [wh-INT **kto** /***którzy** pracuje ciężko].
       Tell me who.NOM/*RP.NOM.M.S works hard
       'Tell me who works hard.'

    b. [FR **Kto** /***którzy** ciężko pracuje] czuje się zmęczony ale szczęsliwy.
         who.NOM/*RP.NOM.M.S hard works feels self tired but happy
       'He who works hard feels tired but happy.'

    c. Ludzie [HR ***kto** /**którzy** pracują ciężko] czują się zmęczeni ale szczęsliwi.
       People *who.NOM/RP.NOM.M.S work.3P hard feel.3P self tired but happy
       'People who work hard feel tired but happy.'

(43) *what*

    a. Powiedz mi [wh-INT **co** /*które /*co ugotowałes].[20]
       Tell me what/*RP.ACC.N.S/*COMP cooked.2S
       'Tell me what you cooked.'

    b. Posmakowalam [FR **co** /*które /*co ugotowałes].
       tasted.1S what/*RP.ACC.N.S/*COMP cooked.2S
       'I tasted what you cooked.'

    c. Posmakowalam jedzenie [HR ***co** /które /co ugotowałes].
       tasted.1S food *what/RP.ACC.N.S/COMP cooked.2S
       'I tasted the food you cooked.'

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[19] Citko (in progress) shows that Polish phrasal wh-words can introduce what she calls 'light-headed relatives', i.e. relative clauses whose head does not contain an overt noun but only a pronominal or determiner-like element.

[20] *Co* is both the nominative/accusative form of the wh-word for *what* in wh-INTs and FRs and the complementizer that can introduce HRs. Nevertheless, Fisiak *et al*. (1978) and Citko (in progress) convincingly show the distribution of the two *co* never overlaps.

(44) *where*

    a. Nie wiem [_{wh-INT} **gdzie** moi rodzice się urodzili].

        not know   where my parents self were-born.3P

        'I don't know where my parents were born.'

    b.?Urodziłam się [_{FR} **gdzie** moi rodzice się urodzili].

        Was-born.1S self   where my parents self were-born.3P

        'I was born where my parents were born.'

    c. Urodziłam się w tym samym miescie **[**_{HR} **gdzie** moi rodzice się urodzili].

        Was-born.1S self in this same   town   where my parents self were-born.3P

        'I was born in the (same) town where my parents were born.'

(45) *when*

    a. Zapytałam ciebie [_{wh-INT} **kiedy** Maria przyjechała].

        asked.1S   you.ACC   when Maria arrived.3S

        'I asked you when Maria arrived.'

    b. Wyjechałam [_{FR} **kiedy** Maria przyjechała].

        left.1S   when Maria arrived.3S

        'I left when Maria arrived.'

    c. Wyjechałam w momencie [_{HR} **kiedy** Maria przyjechała].

        left.1S   in moment   when Maria arrived.3S

        'I left at the moment when Maria arrived.'

(46) *how*

    a. Powiedz mi [_{wh-INT} **jak** to zrobiłeś].

        tell   me   how it did.2S

        'Tell me how you did it.'

    b. [_{FR} **Jak** to zrobisz], na pewno będzie   dobrze.

           how it do.FUT.2S certainly   be.FUT.3S good

        'The way you do it will certainly be good.'

    c. Zrobiłem to w ten sam sposob [_{HR} **jak** ty to zrobiłeś].

        did.1S   it in this same way   how you it did.2S

        'I did it in the same way you did it.'

(47) *why*

    a. Powiedz me [wh-INT **dlaczego**   to zrobiłeś].
        tell   me   for-what/why it did.2S
        'Tell me why you did it.'

    b.*Zrobiłem to [FR **dlaczego**   ty   to zrobiłeś].
        did.1S   it   for-what/why you it did.2S
        ('I did it for the same reason why you did it.')

    c.*Zrobiłem to z   tego samego powodu [HR **dlaczego** ty to zrobiłeś].
        did.1S   it from this   same   reason   why   you it did.2S
        ('I did it for the same reason why you did it.')

    c'. Zrobiłem to dlatego [HR **dlaczego**   ty   to zrobiłeś].
        did.1S   it for-that   for-what/why you it did.2S
        'I did it for the same reason why you did it.'

Table 4. Distribution of wh-words in Polish

	who	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√	√	?	√	√	*
HRs	*	*	√	√	√	*/√

Specific comments. **How**. The form *jak* 'how' is three-ways ambiguous. It can behave like *how* and introduce manner wh-INTs and FRs, or it can introduce a temporal clausal adjunct like *before*, or, finally, it can behave like *if* and introduce the protasis of a conditional (Citko 2000). The context may help to disambiguate, as in (46b) above.

1.4.2.4 A Finno-Ugric language: Estonian

General comments. Estonian exhibits a mixed pattern. *Mida* 'what', *keda* 'who', and *kus* 'where' can introduce wh-INTs, FRs and HRs. *Millal* 'when' can introduce only wh-INTs (cf. German, Dutch, West Flemish for a similar restriction). *Kuidas* 'how' and *miks* 'why' can introduce wh-INTs and HRs, but not FRs. As for *miks* 'why', Estonian patterns like English: it can introduce wh-INTs and HRs, but not FRs. On the other hand, the ban on FRs introduced by *kuidas* 'how', but not on HRs, is unusual.

Estonian has an extremely rich case system. In the glosses below, PART stands for partitive case, INE for inessive case (*in*, *at*), and ADE for adessive case (*on*). The other abbreviations for case marking are the usual ones.

(48) *who*
    a. Ütle mulle, [wh-INT **keda**   sina imetled].
        tell   me   who.PART you admire
        'Tell me who you admire.'
    b. Ma imetlen (?neid) [FR **keda**   sina imetled].
        I   admire (?those)   who.PART you admire
        'I admire those who you admire.'
    c. Ma imetlen inimesi, [HR **keda**   sina imetled].
        I   admire people.PART who.PART you admire
        'I amire the people you admire.'

(49) *what*
    a. Ütle mulle, [wh-INT **mida**   sa^{21} küpsetasid].
        tell   me   what.PART you cooked
        'Tell me what you cooked.'
    b. Ma maitsesin, [FR **mida**   sa küpsetasid].
        I   tasted   what.PART you cooked
        'I tasted what you cooked.'
    c. Ma maitsesin **toitu**,   [HR **mida**   sa küpsetasid].
        I   tasted   food.PART.PL what.PART you cooked
        'I tasted the food you cooked.'

(50) *where*
    a. Ma ei   tea,   [wh-INT **kus**   mu vanemad sündisid].
        I   not know   where my parents   came-to-birth
        'I don't know where my parents were born.'
    b. Ma sündisin   (?seal), [FR **kus**   mu vanemad(-ki) sündisid].
        I   came-to-birth (?there)   where my parents(-too) came-to-birth
        'I was born where my parents (too) were born.'
    c. Ma sündisin   sama-s linna-s, [HR **kus**   mu vanemad(-ki) sündisid].
        I came-to-birth same.INE town.INE   where my parents(-too) came-to-birth
        'I was born in the (same) town **where** my parents (too) were born.'

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[21] *Sa* is an unstressed (contracted) form of *s(in)a* (cf. (48b-c)). They both mean 'you' in the nominative case, but the full form is focused or more emphatic

(51) *when*

    a. Ma küsisin sult, [wh-INT **millal/*kui** Maria saabus].

       I   asked   you   when/*as   Maria arrived

       'I asked you when Maria arrived.'

    b. Ma lahkusin (siis), [***millal/kui** Maria saabus].[22]

       I   left   then   *when/as   Maria arrived.

       'I left when Maria arrived.'

    c. Ma lahkusin hetkel   [HR ***millal/kui** Maria saabus].

       I   left   moment.ADE *when/as   Maria arrived

       'I left at the moment when Maria arrived.'

(52) *how*

    a. Ütle mulle, [wh-INT **kuidas/*nagu** sa   seda tegid].

       tell me   how /*as   you it   did

       'Tell me how you did it.'

    b. Ma tegin seda (nii) [***kuidas/nagu** sina seda tegid].[23]

       I   did   it   so *how /as   you it   did

       'I did it how you did it.'

    c. Ma tegin seda sama moodi [HR ?**kuidas/nagu** sina seda tegid].

       I   did   it   same way   ?how /as   you it   did

       'I did it in the same way you did it.'

(53) *why*

    a. Ütle mulle, [wh-INT **miks** sa   seda tegid].

       tell me   why you it   did

       'Tell me why you did it.'

    b.*Ma tegin seda [FR **miks** sina seda tegid].

       I   did   it   why you it   did

    c. Ma tegin seda samal   põhjusel, [HR **miks** sina seda tegid].

       I   did   it   same.ADE reason.ADE   why you it   did

       'I did it for the same reason why you did it.'

---

[22] According to our definition, the acceptable variant of the bracketed clause in (51b) is not a FR since it is not introduced by a wh-word.

[23] According to our definition, the acceptable variant of the bracketed clause in (52b) is not a FR since it is not introduced by a wh-word.

Table 5. Distribution of wh-words in Estonian

	who	what	where	when	how	why
Wh-INTs	√	√	√	√	√	√
FRs	?	√	?	*	*	*
HRs	√	√	√	*	?	√

Specific comments. **Who** and **Where**. FRs introduced only by *keda* 'who' or *kus* 'where' sound slightly less acceptable than the corresponding HRs. Notice that, according to our definition, the bracketed clauses in (48b) and (50b) are no longer FRs when the wh-clause is immediately preceded by demonstratives like *neid* 'those' and *seal* 'there', respectively. They are HRs with a determiner-like HEAD (cf. the very end of §1.1).

1.4.2.5 A Semitic language: Hebrew

General comments. Hebrew is the paradigmatic language as far as FRs are concerned. It exhibits a very clear pattern with no exceptions. The equivalents of *who, what, where, when,* and *how* in Hebrew can all be used to form both wh-INTs and FRs, but they can never occur in HRs. FRs and wh-INTs are distinguishable in form because FRs always require the wh-word to be followed by the clitic complementizer *še-*, while wh-INTs never allow the complementizer to occur. (*še-* has been glossed as COMP in both HRs and FRs.) Also, unlike wh-INTs, FRs in object position can or must be preceded by the accusative marker *et*, as in (54b) and (55b).

(54) *who*

    a. Tagid li   [_{wh-INT} *(**mi**) oved   kaše].

      tell   me   *(who) works hard

      'Tell me who works hard.'

    b. Ani ma'aric (et)²⁴ [_{FR} ***(mi)** še-oved   kaše].

      I   admire (ACC) *(who) COMP-works hard

      'I admire the one/those who work(s) hard.'

    c. Ani ma'aric (et   ha-)anašim [_{HR} (***mi**) še-ovdim   kaše].

      I   admire (ACC the-)people   (*who) COMP-work.3P hard

      'I admire (the) people who work hard.'

(55) *what*

    a. Tagid li [_{wh-INT} *(**ma**)   Dan bišel].

      tell   me   *(what) Dan cooked

      'Tell me what Dan cooked.'

    b. Axalti et [_{FR} *(**ma**) še-Dan   bišel].

      ate.1S ACC   *(what) COMP-Dan cooked

      'I ate what Dan cooked.'

    c. Axalti (et ha-)oxel   [_{HR} (***ma**) še-Dan   bišel].

      ate.1S (ACC the-)food   (*what) COMP-Dan cooked

      'I ate (the) food that Dan cooked.'

(56) *where*

    a. Ani lo yode'a [_{wh-INT} *(**eyfo**)   ha-horim   šeli noldu].

      I   not know   *(where) the-parents mine be-born

      'I don't know where my parents were born.

    b. Noladeti [_{FR} *(**eyfo**) še-ha-horim   šeli   noldu].

      be-born.1S   *(where) COMP-the-parent mine be-born

      'I was born where my parents were born.'

    c. Noladeti   be-oto makom [_{HR} (***eyfo**) še-ha-horim   šeli   noldu ?(b-o)].

      be-born.1S in-same place   (*where) COMP-the-parents mine be-born ?(in-it)

      'I was born in the (same) town where my parents were born.'

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²⁴ According to my consultants, (54b) without *et* would be better translated as 'I admire whoever works hard'.

(57) *when*

    a. Ša'alti   otxa [_{wh-INT} *(**matay**) Rut higi'a].

        asked.1S you   *(when) Ruth arrived

        'I asked you when Ruth arrived.'

    b. Halaxti [_{FR} *(**matay**) še-Rut   higi'a].[25]

        went.1S   *(when) COMP-Ruth arrived

        'I left when Ruth arrived.'

    c. Halaxti ba-rega   [_{HR} (***matay**) še-Rut   higi'a].

        went.1S in-the-moment (*when) COMP-Ruth arrived

        'I left at the moment when Ruth arrived.'

(58) *how*

    a. Tagid li [_{wh-INT} *(**eyx**) Dan asa et   ze].

        tell   me   *(how) Dan did ACC this

        'Tell me how Dan did it.'

    b. Asiti et   ze [_{FR} *(**eyx**) še-Dan   asa et   ze].

        did.1S ACC this   *(how) COMP-Dan did ACC this

        'I did it how Dan did it.'

    c. Asiti et   ze be-ota derex [_{HR} (***eyx**) še-Dan   asa et   ze].

        did.1S ACC this in-same way   (*how) COMP-Dan did ACC this

        'I did it in the (same) way Dan did it.'

(59) *why*

    a. Tagid li [_{wh-INT} *(**lama**) Dan asa et   ze].

        tell   me   *(why) Dan did ACC this

        'Tell me why you did it.'

    b.%Asiti et   ze [_{FR}*(**lama**) še-Dan   asa et   ze].[26]

        did.1S ACC this *(why) COMP-Dan did ACC this

        'I did it because Dan did it.'

        (It cannot mean: "I did it for the same reason why Dan did it.")

    c. Asiti et   ze me-ota   siba [_{HR} (***lama**) še-Dan   asa et   ze].

        did.1S ACC this from-same reason   (*why) COMP-Dan did ACC this

        'I did it for the same reason why Dan did it.'

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[25] The sentence is "very colloquial" for one of my consultants, "slightly colloquial" for another one and "totally fine" for my third consultant.

[26] The sentence is "*?" for one of my consultant, "very colloquial" for another one and "totally fine" for the third one.

Table 6. Distribution of wh-words in Hebrew

	who	what	where	when	how	why
Wh-INTs	√	√	√	√	√	√
FRs	√	√	√	√	√	*
HRs	*	*	*	*	*	*

Specific comments. **Why.** The wh-word *lama* 'why' seems to be able to occur in what looks like a FR in (59b), but the intended meaning makes clear that we are dealing with a case of homophony. *Lama* in the embedded clause in (59b) acts like a subordinate conjunction rather than a wh-word licensing an adjunct gap. It is interpreted as 'for the reason that', while it can never mean 'for the reason why'. This is similar to what we saw above for the equivalent of *why* in Italian (cf. 1.4.2.2).

1.5. Some conclusions on the distribution of wh-words

The data above and in Appendix 1 clearly show that there are many languages that make use of (all or some) phrasal wh-words to form non-interrogative clauses, i.e. FRs. Some of these languages use the same wh-words as relative pronouns to introduce HRs as well (e.g. Estonian). Others do that only partially (e.g. English) or with just one phrasal wh-word (e.g. Italian). The rest either form HRs with relative pronouns that are morphologically unrelated to wh-words (e.g. German) or do not make use of relative pronouns at all (e.g. Hebrew).

Interestingly, I have not yet found any language that uses two unrelated sets of elements to form wh-INTs and HRs in which FRs pattern with HRs rather than wh-INTs. I take this as strong initial evidence that 1) FRs are not a special case of HRs, namely HRs without a head; and 2) FRs and wh-INTs are closely related, in particular their

wh-words are the same lexical items. I will discuss these claims in turn.

If FRs were just a special case of HRs (e.g. HRs with a phonologically null head), we would expect to find at least the following. First, HRs should always be introduced by the same lexical items that introduce FRs.[27] But this is not the case, as the data above and in Appendix 1 show very clearly. For instance, wh-words can never introduce HRs in German nor in Hebrew. Second, we should find languages that use one class of lexical items to form HRs and FRs, and another class, morphologically unrelated, to form wh-INTs. I have not yet found any language like this. Therefore, I conclude that FRs are not just a special case of HRs. Incidentally, this conclusion is in contrast with most of the (syntactic) literature on FRs, as we will see in Chapter 2.

If the wh-words that introduce both wh-INTs and FRs were not the same lexical items, the only other option we would be left with is that they are ambiguous. *Tertium non datur*. We would then be dealing with massive cross-linguistic categorial lexical ambiguity: 'categorial' because it concerns a class of lexical items (i.e. wh-words) and not just one element; 'cross-linguistic' because it would be attested in many different languages; finally, 'massive' because it would concern at least 75 lexical items.[28] But lexical ambiguity does not work like this. It is intrinsically non-systematic and language specific. Therefore, wh-words that occur in wh-INTs and FRs are not ambiguous. The

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[27] The other way around would not necessarily be expected. HRs could still be formed in ways FRs cannot. For instance, one could claim that the reason why HRs can be introduced by a complementizer or nothing at all in some languages is because the presence of the preceding head licenses some process of deletion under recoverability. Of course, this option would not be available with FRs, given that they lack a head by definition.

[28] So far, I have found FRs in twenty-nine languages that are still spoken, each of which makes use of three or more wh-words to form FRs.

only option we are left with is that they must be the same lexical items. This conclusion is particularly important. If the wh-words in wh-INTs and FRs are the same, whatever we conclude about their meaning in one construction should apply to the other as well. In particular, we could look at the semantic contribution of wh-words in FRs and understand their semantic contribution in wh-INTs at the same time. This is one of the main goals of the present work.

One more observation before concluding. No language can form FRs by means of the wh-word for *why*. This is the only phrasal wh-word that consistently fails to introduce FRs across the languages I have looked at so far.

In the next chapters, a semantic analysis of FRs and wh-words will be given, which is based on the definition, data and conclusions presented in this chapter. Further data will presented and discussed.

CHAPTER 2

Maximality and the Semantics of DP-like Standard Free Relatives

2.1. Overview of the chapter

This chapter is mainly devoted to an analysis of the semantic contribution of a subset of FRs that I labeled *DP-like standard free relatives*. I will start by defining *standard free relatives* (§ 2.2). Then, I will distinguish *DP-like standard free relatives* from *PP-like standard free relatives* to conclude with the generalization that DP-like standard free relatives semantically behave like definite DPs, i.e. they always denote an entity (§ 2.3). The main part of the chapter will be devoted to a semantic analysis that accounts for this generalization (§ 2.4). Then, I will compare my analysis with other proposals that have been suggested (§ 2.5). Finally, I will briefly discuss the open issue of the syntactic structure of DP-like standard free relatives (§ 2.6).

2.2. Standard free relatives

I call **standard free relatives**[1] (henceforth, **standard FRs**) FRs that 1) are introduced by "bare" wh-words and 2) do not occur in the complement position of existential predicates. The first restriction excludes **-*ever* free relatives**, i.e. FRs introduced by wh-words with the *-ever* suffix or its equivalent across languages, like *I will eat* [FR *whatever you cook*]. Their semantic properties will be discussed in Chapter 4. The second

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[1] I am borrowing the term from Grosu (2003).

restriction excludes **existential free relatives**, i.e. FRs that occur in the complement position of some existential predicates and can be replaced and paraphrased with indefinites. Existential FRs are not found in Germanic (with the exception of Yiddish), but they are widely attested across the other languages that have standard FRs. Existential FRs will be dealt with in Chapter 3. An example from Italian is given in (1).

(1) Non ho [FR chi   mandare alla   conferenza].
    not   have.1S who to-send   to-the conference
    'I don't have anybody to send to the conference.'

What is the semantic contribution of standard FRs? Standard FRs can always be replaced and paraphrased with DPs or PPs. The English examples from Chapter 1 are repeated in (2) below.

(2) a. I'll marry [FR who you choose].
     a'. I'll marry [DP the person you choose].
     b. I tasted [FR what Adam cooked].
     b'. I tasted [DP the food/things Adam cooked].
     c. You can't smoke [FR where the kids are playing].
     c'. You can't smoke [PP in the places where the kids are playing].
     d. I left [FR when Flavio arrived].
     d'. I left [PP at the same time that Flavio arrived].
     e. I did it [FR how you did it].
     e'. I did it [PP in the way you did it].

Examples from other languages were given in the cross-linguistic section of Chapter 1 and in the Appendix. The c. example of each triplet contained a DP or PP with a HR that was a close paraphrase of the FR in the b. example. In brief, standard FRs look like clauses, but semantically behave like DPs or PPs.

2.3. DP-like standard free relatives and PP-like standard free relatives

2.3.1. DP-like standard free relatives

I call a **DP-like standard FR** a standard FR that can be replaced and paraphrased with a DP and occurs in an argument position (subject, direct/indirect object, object of preposition). Examples of DP-like standard FRs in different syntactic positions are given in (3), immediately followed by the result of replacing them with a DP.

(3) *FRs in subject position*
    a. [FR What you just said] doesn't make much sense.
    b. [DP The things you just said] don't make much sense.

(4) *FRs in direct object position*
    a. You are not gonna meet [FR who I am going out with].
    b. You are not gonna meet [DP the person/people I am going out with].

(5) *FRs in indirect object position*
    a. I gave [FR what you wrote] the highest grade I've ever given in my entire teaching career.
    b. I gave [DP your paper] the highest grade I've ever given in my entire teaching career.

(6) *FRs in object of preposition position*
    a. I want to be hired for [FR what I do as a researcher], not for [FR who I sleep with].
    b. I want to be hired for [DP the work I do as a researcher], not for [DP the (kind of) people I sleep with].

    Although standard FRs introduced by *who* and *what* are more common and sound somehow more natural, DP-like standard FRs can also be introduced by *where*, *when*, and *how*.

(7) *where*
    a. I really liked [FR where we had dinner last night].
    a'. I really liked [DP the place where we had dinner last night].
    b. [FR Where I went on vacation last year] was really fabulous.
    b'. [DP The place I went on vacation last year] was really fabulous.

(8) *when*

    a. % I hate [FR when you yell like that].[2]

    a'. I hate [DP the times/situations when you yell like that].

    b. Our first date and [FR when he kissed me for the first time] will stay in my memory forever.

    b'. Our first date and [DP the moment he kissed me for the first time] will stay in my memory forever.

(9) *how*

    a. I really hate [FR how he behaves when he gets high].

    a'. I really hate [DP the way(s) he behaves when he gets high].

    b. [FR How she did it] turned out to be very expensive.

    b'. [DP The way she did it] turned out to be very expensive.

    c. You should pay some attention to [FR how she works].[3]

    c'. You should pay some attention to [DP the way she works].

    d. This is [FR how he always flung his hat onto the hallstand].[4]

    d'. This is [DP the way he always flung his hat onto the hallstand].

    f.% The prefixing thematic vowel carries no meaning in itself, though it is often changed in different verbal moods, similar to [FR how the thematic [a] in Spanish "habl-*a*-s" becomes [e] in the subjunctive "habl-*e*-s"].[5]

    f'. The prefixing thematic vowel carries no meaning in itself, though it is often changed in different verbal moods, similar to [DP the way the thematic [a] in Spanish "habl-*a*-s" becomes [e] in the subjunctive "habl-*e*-s"].

2.3.2. PP-like standard free relatives

I call **PP-like standard FRs** all standard FRs that are not DP-like standard FRs. In other words, PP-like standard FRs are either standard FRs that can be replaced and paraphrased with a PP (or a DP) in an adjunct position or with a PP in a complement position (i.e. an argument position that is different from the subject position). Only standard FRs

[2] Some speakers prefer *I hate it* [FR *when you yell like that*] to (8a), but the bracketed string is no longer a DP-like standard FR according to our definition, since the matrix object position is now occupied by *it*.

[3] Smits (1989: 298, ex. 21).

[4] Smits (1989: 298, ex. 25).

[5] Thanks to Pam Munro for pointing this out from a thesis she was reading. She also added that she herself cannot use this FR with *how* in this context.

introduced by *where*, *when*, and *how* can occur as PP-like standard FRs. Examples are given in (10) (see (2c-e) above for more).

(10) a. I went [FR where you told me to], but I couldn't find anything.
    a'. I went [PP to the place where you told me to], but I couldn't find anything.[6]
    b. [FR When you say goodbye], I die a little.
    b'. [DP Every time you say goodbye], I die a little.
    b". [PP On the occasions you say goodbye], I die a little.
    c. I studied for the final [FR how you studied for it], but you did better.
    c'. I studied for the final [PP in the same way you studied for it], but you did better.

In (10a), the standard FR, introduced by *where*, occurs in the complement position of the matrix verb. Though this is an argument position, the FR is a PP-like standard FR because it can be replaced and paraphrased with a PP (10a'). In (10b), the standard FR introduced by *when* occurs in an adjunct position; therefore, it is a PP-like standard FR, although it can be replaced and paraphrased with either a DP (10b')[7] or a PP (10b"). Finally, the standard FR introduced by *how* in (10c) is a PP-like standard FR, since it both occurs in an adjunct position and can be replaced and paraphrased with a PP (10c').

2.3.3. Standard free relatives introduced by *why*?

In English, there are non-interrogative wh-clauses introduced by *why*, like the bracketed ones in (11a,b). Although they may look like DP-like standard FRs, I believe there is

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[6]Carson Schütze pointed out that *I went (to)the places you told me to* is acceptable both with and without the preposition *to*. Since my consultants agreed that the preposition-less option is restricted to just the plural form of noun *places* (**I went the place you told me to*; **I went grocery stores you told me*), I will ignore this idiosyncratic case for the time being and I will assume that PP-like standard FRs can never be replaced by a DP when they occur in a complement position.

[7] DP-like temporal adjuncts like the bracketed one in (10b) are sensitive to the nature of their nominal head. They can occur with nouns that refer to time units (*time*, *year*, *day*, *minute*, etc.), while they are not acceptable with nouns like *situations* or *occasions*: (**On*) *every occasion/situation you say goodbye, I die a little*. They may just be PPs with a covert P that is licensed by only certain nouns.

evidence that they are HRs with an elided HEAD. The HEAD can be elided in this context because its content is fully recoverable from the wh-word *why* without ambiguity: it is always something like *the reason*. If so, then (11a) and (11b) have exactly the same syntactic structure as (11a') and (11b'), respectively.

(11) a.   This is [why he never laughs].
     a'.   This is [DP the reason why he never laughs].
     b.   I haven't thought about [why he left so soon].
     b'   I haven't thought about [DP the reason why he left so soon].

One piece of evidence against (11a,b) being DP-like standard FRs is that, as we just saw, *where*, *when*, and *how* can very naturally introduce PP-like standard FRs, while *why* never can. For instance, the bracketed FR in (12a) is an example of a PP-like standard FR introduced by *how* and it is truth-conditionally equivalent to the bracketed PP in (12a'). On the other hand, (12b) can never mean what (12b') means, because (12b) is totally unacceptable.

(12) a.   I did it [FR **how** you did it].
     a'.   I did it [PP in the same way that you did it].
     b. *I did it [**why** you did it].
     b'.   I did it [PP for the (same) reason (why) you did it].

Cross-linguistic evidence supports this conclusion as well. If *why* could actually introduce a FR, we would expect some of the languages that cannot use their equivalent of *why* as relative pronoun still to be able to use it to introduce FRs. Languages like Italian or Hebrew, which cannot use the equivalent of interrogative *why* as a relative pronoun, cannot use it in what would appear to be a DP-like standard FR either. (13) shows this pattern for Italian.

(13) a. *Questo è   [**perché** non ride   mai].
           this   is why   not laughs never
           ('This is why he never laughs.')
     a'. Questo è [il motivo ***perché**/ per cui non ride   mai].
           this   is the reason *why   / for REL not laughs never
           'This is the reason why he never laughs.'

2.3.4. Generalization about the semantic contribution of DP-like standard FRs

To sum up, all and only standard FRs in an argument position that can be replaced and paraphrased with a DP are DP-like standard FRs. All other standard FRs are PP-like standard FRs. With this distinction in hand, we can state the generalization about the semantic contribution of DP-like standard FRs as follows:

(14) DP-like standard FRs always denote an entity, i.e. they behave like definite DPs.

The remainder of the chapter is mainly devoted to discussing the data that support this generalization and trying to account for it in a principled way.

2.4. The semantics of DP-like standard free relatives

2.4.1. The external semantics of DP-like standard free relatives[8]

The hypothesis that I want to argue for that DP-like standard FRs always denote an entity, rather then a set or any other semantic object, and that this entity is exactly the same as the one that definite DPs denote. In order to do so, I will first introduce Link's (1983) proposal for the semantics of definite DPs, so that we have a precise definition of

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[8] Henceforth, the term *external semantics* of an expression will be used to refer to the semantic contribution of that expression as a whole, while the term *internal semantic*s will refer to the semantic contribution of the parts that the expression is made up of and the way they are semantically composed.

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the object definite DPs denote (§ 2.4.1.1). Then, following Jacobson (1995), I will extend Link's analysis to DP-like standard FRs (§ 2.4.1.2). Finally, I will give some evidence in favor of the empirical claim that DP-like standard FRs denote maximal entities (§ 2.4.1.3).

2.4.1.1 The semantics of definite DPs (Link 1983)

Link (1983) proposes an elegantly unified semantic analysis for singular and plural definite DPs, according to which they both refer to the *maximal* element of the set denoted by the NP. [9]

The main intuition behind this proposal is that we can conceive and use language to refer and attribute properties to both simple objects (**atomic entities**) and complex objects (**plural entities**). The latter result from grouping atomic entities and/or other plural entities and conceiving the result as a unit. Link formalizes this notion with an operation called **sum** and uses the symbol $\oplus$ to indicate that two entities have been grouped together by means of sum.

For instance, an egg and a carrot each are atomic entities. We can attribute to them separate properties. We can believe of the egg that it is big and of the carrot that it is small. But we can also look at them as just one entity, i.e. egg$\oplus$carrot, and attribute properties to it. For instance, we may think that the egg and the carrot together constitute a good snack, but just the egg or just the carrot would not. So what makes the snack a good one is neither the atomic entity egg nor the atomic entity carrot, but the entity

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[9] See also Sharvy (1980).

egg⊕carrot. Since this entity is made of smaller units, it is no longer an atomic entity, but a plural one. If we now take another atomic entity, e.g. an onion, into consideration, we can add it to the plural entity we already have, i.e. egg⊕carrot, and obtain another plural entity, i.e. egg⊕carrot⊕onion, which is now made of three atomic entities; and so on and so forth.[10]

We have a notion of entities being "bigger" than the entities they are made of. The plural entity egg⊕carrot⊕onion is made of "smaller" units: an egg, a carrot and an onion; or egg⊕carrot and an onion; or an egg and carrot⊕onion; or egg⊕onion and a carrot. Those smaller units are all "part of" egg⊕carrot⊕onion. The egg is part of the plural entity egg⊕carrot, therefore egg⊕carrot is bigger than the egg. Similarly, the plural entity egg⊕carrot is part of the plural entity egg⊕carrot⊕onion. Link (1983) formalizes these intuitions by means of the ***part-of* relation** ($\leq$).[11] Given a set of atomic entities and all of the possible plural entities built by summing the atomic entities, there will always be an entity that is bigger than all the others. This is called the **maximal entity** of that set. A general definition of the maximal entity of a set is given in (15).

(15) *Maximal entity* $\max_P$ *of a set of entities* P
$\max_P = x$ such that $x \in P$ and $\forall y \in P \ y \leq x$

In the example above, it is easy to see that egg⊕carrot⊕onion is the maximal entity. It can be proved that if there is a maximal entity, it is unique, and that the maximal entity is the only entity of the set such that all the entities are part of it. Maximal entities are not

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[10] See Schwarzschild (1996) for a concise introduction to recent theories of the semantics of plurals and for a radically different proposal.

[11] The *part-of* relation is reflexive, transitive and anti-symmetric.

necessarily plural entities. For instance, the maximal entity of the singleton set containing just an egg is the egg itself, i.e. an atomic entity.

Let us now look at how these ideas can be applied to natural language and to the semantics of definite DPs. If Adam cooked only an egg, then the singular NP *thing that Adam cooked* will denote the singleton set containing just that egg, i.e. an atomic entity, (16a), while the singular definite DP *the thing that Adam cooked* will refer to the maximal entity in that set, i.e. the only thing that Adam cooked, i.e. the egg (16b).

(16) If an egg *e* is the only thing that Adam cooked, then:
    a.   *Singular NP*: ⟦thing that Adam cooked⟧ = {e}
    b.   *Singular DP*: ⟦**the** thing that Adam cooked⟧ = e

On the other hand, if an egg, a carrot and an onion are the only things that Adam cooked, then the singular NP *thing Adam cooked* will denote the set containing those three atomic entities (17a). When plural morphology is added to the NP, it has a crucial semantic effect: it closes the set denoted by the singular NP under the sum operation and excludes all the atomic entities. Intuitively, the plural NP *things that Adam cooked* will denote the set of all the plural entities that can be obtained by summing the egg, the carrot and the onion in all the possible combinations. It can be shown that such a structure has a unique maximal entity, i.e. e⊕c⊕o. This is the only element of the structure such that all the elements are part of it.

Finally, the plural definite DP *the things that Adam cooked* will refer to the maximal entity of the set denoted by the plural NP (17c), in the same way that the singular definite DP *the thing that Adam cooked* above referred to the maximal entity of the set denoted by the singular NP.

(17) If an egg e, a carrot c and an onion o are the only things Adam cooked, then:
  a. *Singular NP*: ⟦thing that Adam cooked⟧ = {e, c, o}
  b. *Plural NP*: ⟦thing**s** that Adam cooked⟧ = $\left\{ \begin{array}{c} e{\oplus}c{\oplus}o \\ \diagup\triangle \\ e{\oplus}c \ \ e{\oplus}o \ \ c{\oplus}o \end{array} \right\}$
  c. *Plural DP*: ⟦**the** thing**s** that Adam cooked⟧ = e⊕c⊕o

2.4.1.2 DP-like standard free relatives denote maximal entities

Following Jacobson (1995),[12] DP-like standard FRs can be given a semantic analysis along the lines of Link's (1983) proposal for definite DPs: DP-like standard FRs denote maximal entities too. For instance, in the usual situation in which an egg e is the only thing that Adam cooked, the DP-like standard FR in (18a) denotes the singular maximal entity of the set of things that Adam cooked (18b). Since this set contains only one element, its only element and its maximal entity coincide and are both singular entities. As we saw in the previous section, this is the same entity that the corresponding <u>singular</u> definite DP denotes (18c). Notice that the denotation of the corresponding plural definite DP would be undefined in this situation, since a plural definite DP can only denote a <u>plural</u> maximal entity (18d).

(18) If an egg e was the only thing that Adam cooked, then:
  a. Jie ate [FR what Adam cooked].
  b. ⟦[FR what Adam cooked]⟧ = e
  c. ⟦[FR what Adam cooked]⟧ = ⟦[singular definite DP the thing that Adam cooked]⟧
  d. ⟦[plural definite DP the thing**s** that Adam cooked]⟧ = undefined

On the other hand, if an egg, a carrot and an onion are all and only the things that

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[12] Dayal (1996) extensively argues for a similar proposal for correlatives in Hindu and suggests an extension of this approach to internally headed relative clauses in languages like Japanese, Lakhota, and Quechua. Neither construction that Dayal discusses is introduced by wh-words, therefore neither is a FR according to our definition.

Adam cooked, the very same DP-like standard FR in (19a) now denotes the <u>plural</u>

maximal entity of the set of things that Adam cooked (19b), like the <u>plural</u> definite DP in

(19c). It is the corresponding singular definite DP that is now undefined, since, as we

saw, singular definite DPs can only refer to <u>singular</u> maximal entities.

(19) If an egg e, a carrot c and an onion o are the only things Adam cooked, then:
    a. Jie ate [$_{FR}$ what Adam cooked].
    b. $⟦$[$_{FR}$ what Adam cooked]$⟧$ = e⊕c⊕o
    c. $⟦$[$_{FR}$ what Adam cooked]$⟧$ = $⟦$[$_{DP}$ the thing**s** that Adam cooked]$⟧$
    d. $⟦$[$_{\text{singular definite DP}}$ the thing that Adam cooked]$⟧$ = undefined

Therefore, DP-like standard FRs and definite DPs are truth-conditionally equivalent,

except for the fact that the former do not express any restrictions about the singular *vs.*

plural nature of the maximal entity they denote, while definite DPs do. This is due to the

fact that wh-words in DP-like standard FRs are morphologically singular in English and

this makes the whole DP-like standard FR singular, as shown by the singular agreement

on both the matrix predicate and the FR predicate in (20).

(20) [$_{FR}$ What smell<u>s</u>/*smell good] often taste<u>s</u>/*taste good too.

Although Jacobson (1995) mainly discusses DP-like standard FRs introduced by *what*,

all the kinds of DP-like standard FRs can be analyzed as referring to maximal entities, as

shown in (21)-(24).

(21) *who*
    If I am dating Andrea and Emanuele, then:
    a. You are not gonna meet [$_{FR}$ who I am going out with].
    b. $⟦$[$_{FR}$ who I am going out with]$⟧$ = Andrea⊕Emanuele
    c. $⟦$[$_{FR}$ who I am going out with]$⟧$ = $⟦$[$_{DP}$ the people I am going out with]$⟧$.

(22) w*here*

If we went to the restaurant *Alto Palato* last night, then:

a . I really liked [FR where we had dinner last night].

b. ⟦[FR where we had dinner last night]⟧ = Alto Palato

c. ⟦[FR where we had dinner last night]⟧ = ⟦[DP the place where we had dinner last night]⟧.

(23) w*hen*

If S is the moment/situation in which he kissed me for the first time (e.g., in my bedroom on November 1st 1997 at 9:30 pm while Satie's *1ère Gnossienne* was playing), then:

a. Our first date and [FR when he kissed me for the first time] will stay in my memory forever.

b. ⟦[FR when he kissed me for the first time]⟧ = S

c. ⟦[FR when he kissed me for the first time]⟧ = ⟦[DP the moment we kissed for the first time]⟧

(24) *how*

If H_1 and H_2 are the ways he behaves when he gets high (e.g. he laughs like an idiot all the time (H_1) and does not remember what I asked him to do (H_2)), then:

a. I really hate [FR how he behaves when he gets high].

b. ⟦[FR how he behaves when he gets high]⟧ = $H_1 \oplus H_2$

c. ⟦[FR how he behaves when he gets high]⟧ = [DP the ways he behaves when he gets high].

In order to treat the DP-like standard FRs introduced by *where*, *when*, and *how* in (22)-(24), we need to assume that our ontology also contains entities like places, times/situations and manners/ways (besides the usual animate and inanimate entities) and that they can be summed to form plural entities. I think this a plausible extension of our ontology. We can predicate properties of places, times and manners, in the same way as we do with human beings and objects. A place can be ugly, a time can be wrong, and a manner can be rude. Also, we can predicate properties that apply to sums of places, times and manners, but not their atomic components. For instance, if we claim that two places like Rome and Paris together have nine million inhabitants, this is true only for the sum Paris⊕Rome, but not the atomic places Rome and Paris separately. Similarly, a single time/occasion when a friend gets mad at you may not make you change your mind about

him. On the other hand, if this happens many times, all those times (i.e. the maximal time entity) can make you decide that in the end he is not really a good friend. Finally, if your neighbor always behaves in a nice way with you (e.g. he smiles and says hi), you may think he is a nice guy. On the other hand, if he always behaves in a rude way (e.g. he always ignores you and never says hi), you may thing he is not a nice guy. But if he behaves in both ways at the same time (e.g. he smiles at you first and then ignores you rudely), you may think he is just a weirdo.

In conclusion, I have argued that DP-like standard FRs always denote singular or plural maximal entities, along the lines of Link's (1983) proposal for definite DPs. Jacobson (1995) was the first one to suggest such an analysis for DP-like standard FRs in English. She actually does not distinguish between DP-like standard FRs and PP-like standard FRs. Also, she considers standard FRs and *-ever* FRs to be truth-conditionally equivalent. Neither of these assumptions can be fully correct. In Chapter 4, I will show that standard FRs are not truth-conditionally equivalent to *-ever* FRs and in Chapter 3, we will see that PP-like standard FRs do not denote the same semantic object as DP-like standard FRs. Jacobson (1995) restricts her attention only to English FRs, and all the examples of DP-like standard FRs she discusses are introduced by the wh-word *what*. In this section, I suggested that Jacobson's (1995) proposal can be extended to all kinds of DP-like standard FRs as long as we enrich the ontology with entities like places, times/situations, and manners/ways. Finally, I concentrated on English data in this section to make the discussion easier. As far as I can tell, the conclusions I reached above apply to all the

languages with FRs I have been looking at so far.[13]

2.4.1.3 Evidence

I will give three arguments to support the conclusion that DP-like standard FRs always denote maximal entities. First, I will show that DP-like standard FRs can never refer to any other entity but a maximal entity, even when the context strongly favors a non-maximal reference. Then, I will show that DP-like standard FRs can always be replaced and paraphrased with definite DPs. Finally, I will show that DP-like standard FRs pattern like definite DPs and unlike any other kind of DP as far as their interaction with adverbs of quantification is concerned.

Argument 1. If it were not true that DP-standard FRs (always) denoted a maximal entity, situations should be found in which it would be natural for a DP-standard FR to be interpreted as referring to something smaller than a maximal entity. Here is what looks like a good scenario. Let us assume that Leston just went to Italy for the first time and he tasted lots of good food that he had never tasted before. Of course, there are still plenty of things that he has not tasted yet, not just because Italian cuisine is unbelievably varied and he only visited Milan and Venice for a few days, but also because there are plenty of other (good) culinary traditions around the world. So, during his Italian trip, Leston tasted <u>some</u> dishes he had never tasted before, but certainly not <u>all</u> the dishes he had never tasted before. Therefore, (25a) would be true in this situation, while (25b) would be false or would sound somehow awkward. Now, what about (25c), in which a DP-like standard

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[13] In Modern Greek, most standard FRs seems to be interpreted as the corresponding -*ever* FRs. See data and comment in the Appendix.

FR has replaced the DP in (25a-b)?

(25) a. On his Italian trip, Leston tasted [_indefinite DP_ (**some**) **dishes** he had never tasted before].
   b. On his Italian trip, Leston tasted [_definite DP_ (**all**) **the dishes** he had never tasted before].
   c. On his Italian trip, Leston tasted [_FR_ **what** he had never tasted before].

My consultants agreed that (25c) would be false, or at least would sound as awkward as (25b), in the situation above. This shows that the DP-like standard FR must refer to all the dishes Leston had never tasted before, i.e. the maximal entity that results from the sum of the atomic dishes Leston had never tasted before.

A similar case is given in (26) with an example from Italian. Here the scenario is that Paolo is the director of a lab and has the chance to send only one of his fifteen Ph.D. students to a very prestigious conference. Of those, four students have already been to that conference, while eleven have not. In this situation, (26) is false, since it can only mean that Paolo will send eleven students to the conference, i.e. the maximal entity of the students that have never been to the conference, and not just one of them.

(26) Paolo manderà   alla   conferenza [_FR_ **chi** non c'è   ancora andato].
     Paolo send.FUT.3S to-the conference   who not there's yet   gone
     'Paolo will send to the conference the person/people who hasn't/haven't been there yet.'

Argument 2. DP-like standard FRs can <u>always</u> be paraphrased with definite DPs, which, as we saw earlier, always denote maximal entities. The cross-linguistic examples with a DP-like standard FR given in Chapter 1 and the Appendix are immediately followed by truth-conditionally equivalent examples in which a complex DP containing a HR has replaced the FR. All those complex DPs are definite DPs or equivalents.

For languages with bare DPs (e.g. English), a bare DP can sometimes paraphrase a DP-like standard FR, as in (27).

(27) a. [FR What you find at a garage sale] is usually junk.
  b. [DP (The) things you find at a garage sale] are usually junk.

The bare plural DP in (27b) is a pretty accurate paraphrase of the DP-like standard FR in (27a). But this is not a counterexample to my argument. The bare plural can only be interpreted as referring to the maximal entity resulting from the sum of all the things at a garage sale.[14] In other words, it means all the things at a garage sale, not just some.

Argument 3. A less direct piece of evidence in support of the claim that standard FRs denote maximal entities comes from the so-called "quantificational variability effects". Adverbs of quantity (a subset of adverbs of quantification) like *for the most part*, *in part*, etc. produce the same truth-conditional effects with DP-like standard FRs (28a) and definite DPs (28b,c). On the other hand, the result of combining adverbs of quantity with indefinite DPs or quantified DPs is truth-conditionally different and often uninterpretable (28d-g).

(28) a.   [FR What you bought] is <u>for the most part</u> expensive.
  b.   [DP The things you bought] are <u>for the most part</u> expensive.
  c.   [DP The stuff you bought] is <u>for the most part</u> expensive.
  d. #[DP Everything you bought] is <u>for the most part</u> expensive.
  e. #[DP One thing you bought] is <u>for the most part</u> expensive.
  f. #[DP Something you bought] is <u>for the most part</u> expensive.
  g. #[DP Some stuff you bought] is <u>for the most part</u> expensive.

The interaction between FRs and adverbs of quantification will be discussed in more detail in Chapter 5.

Further indirect support for our hypothesis about the semantic contribution of DP-like

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[14] See Carlson (1977) for a semantic analysis of English bare plurals.

standard FRs will be given in § 2.5, where other proposals will be discussed.

2.4.2. The internal semantics of DP-like standard free relatives

How do DP-like standard FRs, which look like wh-clauses, end up denoting what definite

DPs denote, i.e. maximal entities? In this section, I will show how this result can be

obtained compositionally. First, I will briefly state my assumptions about the syntactic

structure of DP-like standard FRs (§ 2.4.2.1). Then, I will give a compositional analysis

of the semantic contribution of DP-like standard FRs (§ 2.4.2.2).

2.4.2.1 Assumptions about the syntactic structure of DP-like standard free relatives

I assume that standard FRs have the syntactic structure of CPs. Therefore, the standard

FR in (29a) will have the syntactic structure in (29b).

(29) a. Jie ate [$_{FR}$ what Adam cooked].

b.　　IP
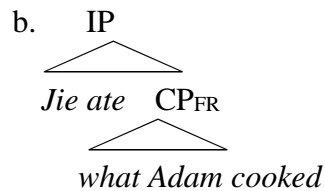
This assumption looks like the simplest one. Standard FRs can look identical to

wh-INTs, as we saw in Chapter 1, and wh-INTs are one of the prototypical cases of CPs.

Although there are differences in the syntactic behavior of standard FRs and wh-INTs, I

am not aware of any non-stipulative way to account for them by means of differences in

their syntactic structures. A brief discussion of some of these differences and the

syntactic proposals that have been suggested to account for the FRs is given in § 2.6.

2.4.2.2 A compositional semantics for DP-like standard free relatives

In this section, I show how DP-like standard FRs denote a maximal entity compositionally. I start with DP-like standard FRs introduced by *who* and *what* (§ 2.4.2.2.1). First I go through the details of the semantic derivation of an example (§ 2.4.2.2.1.1) and then I give a more general formulation and discuss some relevant issues (§ 2.4.2.2.1.2). Then I deal with DP-like standard FRs introduced by *where*, *when*, and *how* (§ 2.4.2.2.2). Finally, I comment on δ and its crucial role in the semantic derivation of DP-like standard FRs (§ 2.4.2.2.3).

2.4.2.2.1 DP-like standard free relatives introduced by *who* and *what*

2.4.2.2.1.1 An example

The sentence in (30a) contains the DP-like standard FR *what Adam liked*, whose LF representation is given in (30b). The DP-like standard FR has a gap in the complement position of its predicate. A trace occupies the gapped position, if we assume that wh-movement has taken place. The semantic derivation for (30) is given in (31). Comments follow.

(30)　a. Jie ate what Adam liked.

b.
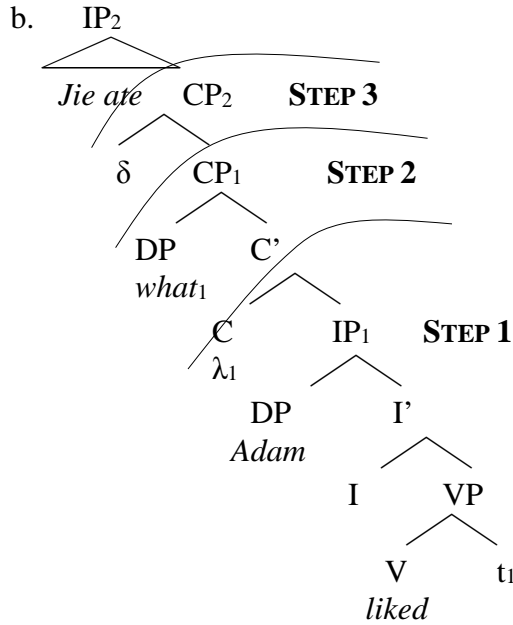
(31) Logical form of the DP-like standard FR in (30)

1.　*liked*　→　$\lambda x \lambda y[\text{like}'(x)(y)]$

2.　$t_1 \rightarrow x_1$

3.　*Adam* →　a

4.　*what*$_1$ →　$\lambda X \lambda x_1[\text{inanimate}'(x_1) \wedge X(x_1)]$[15]

5.　$[_{VP}$ *liked* $t_1] \rightarrow \lambda x \lambda y[\text{like}'(x)(y)](x_1) = \lambda y[\text{like}'(x_1)(y)]$

6.　$[_{I'}$ *liked* $t_1] \rightarrow \lambda y[\text{like}'(x_1)(y)]$

7.　$[_{IP}$ *Adam like* $t_1] \rightarrow \lambda y[\text{like}'(x_1)(y)](a) = \text{like}'(x_1)(a)$

8.　$[_{C'} \lambda_1$ *Adam liked* $t_1] \rightarrow \lambda x_1[\text{like}'(x_1)(a)]$

9.　$[_{CP1}$ *what*$_1$ *Adam liked* $t_1] \rightarrow \lambda X \lambda x_1[\text{inanimate}'(x_1) \wedge X(x_1)] (\lambda x_1[\text{like}'(x_1)(a)]) \equiv$
$\lambda x_1[\text{inanimate}'(x_1) \wedge \lambda x_1[\text{like}'(x_1)(a)](x_1)] \equiv \lambda x_1[\text{inanimate}'(x_1) \wedge \text{like}'(x_1)(a)]]$

10.　$[_{CP2} \delta$ *what Adam liked* $t_1] \rightarrow \sigma x_1 [\lambda x_1 [\text{inanimate}'(x_1) \wedge \text{like}'(x_1)(a)]]$[16]

The semantic derivation of (30) can be divided into three main steps.

STEP 1: up to IP$_1$ level. The predicate *like* denotes a two-place relation that takes two

entities as its arguments (31.1). The human being denoted by *Adam* in subject position is

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[15] Capital *X* stands for a variable over properties or, equivalently, sets of entities.

[16] The σ-operator applies to a set and returns its maximal entity. If the set does not have a maximal entity, then σ is undefined (Link 1983).

one entity. The other should come from the semantic contribution of the object. But the wh-trace in object position does not denote an entity in the same way that *Adam* does. The trace is represented as a free variable at logical form (31.2) and IP$_1$ (the IP of the DP-like standard FR) ends up being represented as an open formula (31.6). In other words, *Adam liked x*$_1$ can be interpreted only if a denotation is assigned to its free variable by an assignment function. When this happens, IP$_1$ denotes a truth value with respect to that specific assignment function.

I am assuming that predicates like *like* can take expressions that denote both atomic and plural entities as their arguments. Therefore, the value of x$_1$ ranges over atomic and plural entities.

In order to keep the explanation as simple and short as possible, I am ignoring some details that are not directly relevant for our discussion. In particular, I am assuming that the inflectional head I and the past morphology on the verb *like* are semantically inert (31.1,6).

STEP 2: CP$_1$ level. For reasons that will be discussed later, I want CP$_1$ (the lowest CP layer of the DP-like standard FR in (30b)) to denote a set of entities, more precisely the set of inanimate entities that Adam liked. So we need to go from the denotation of IP$_1$, i.e. a truth value under an assignment function, to a set of entities. First, I assume that the semantic contribution of the complementizer node C of a wh-clause is to λ-abstract over the free variable that is coindexed with the wh-word, so that C' ends up denoting the set of entities that Adam liked. Second, I assume that the wh-word *what* applies to a set of entities to give back all and only the entities of that set that are inanimate. So CP$_1$ ends up

denoting the set of inanimate entities that Adam liked.

STEP 3: CP₂ level. Finally, a semantic operation applies when the adjunct δ combines with CP$_1$ that changes the denotation from the set of entities that Adam liked (CP$_1$, type <e,t>) to the maximal entity that Adam liked (CP$_2$, type <e>). The σ-operator from Link (1983) applies to a set and returns its maximal entity. Now the DP-standard FR has the right type to combine with the matrix predicate *eat*, which selects for an entity-denoting expression in its object position (type <e>). You can eat only things, not sets.

2.4.2.2.1.2   A more general formulation and some related issues

I will now look at the compositional semantics of DP-like standard FRs introduce by *who* and *what* (and their equivalents across languages) in more general terms, state the crucial rules and assumptions, and discuss them together with some relevant ontological issues. (32) shows a general schema for the LF representation of DP-like standard FRs; (33) gives the main steps of the translation in logical form of a DP-like standard FR; (34) states the rule that triggers λ-abstraction. The discussion that follows below is once again divided into three main steps.

(32) *LF representation of a DP-like standard FR*
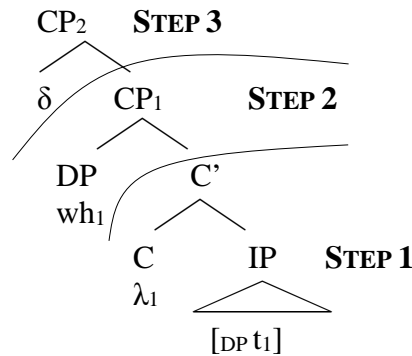
(33) *Main components of the logical form of a DP-like standard FR*

    1. $t_1 \rightarrow x_1$
    2. $IP_1 \rightarrow P(x_1)$
    3. $wh_1 \rightarrow \lambda X \lambda x_1 [\pm animate'(x_1) \wedge X(x_1)]$
    4. $\delta \rightarrow \lambda X \sigma x[X(x)]$
    4. $[_{C'} \lambda_1 IP] \rightarrow \lambda x_1 P(x_1)$
    5. $[_{CP1} wh_1 C'] \rightarrow \lambda x_1 [\pm animate'(x_1) \wedge P(x_1)]$
    6. $[_{CP2} \delta CP_1] \rightarrow \sigma x_1 [\pm animate'(x_1) \wedge P(x_1)]$

(34) *Rule to combine the wh-complementizer λ with its IP sister*
    if $IP_1 \rightarrow P(x_1)$
    then $[_{C'} \lambda_1 IP] \rightarrow \lambda x_1 [P(x_1)]$

STEP 1: up to IP level. A DP-like standard FR always contains a DP gap in argument position by definition (§ 2.3). I assume the gap is filled in with t_1, the trace of the wh-word *wh₁* that has been moved to Spec of CP_1 (32). I also assume that an indexed trace translates into an indexed free variable at logical form (33.1). Given this assumption, the IP of a DP-like standard FR will always denote an open formula (33.2).

An open formula is a formula with a free variable. A free variable is an unbound variable whose value needs an assignment function to be determined. An assignment function is introduced into the model precisely to assign a value to each free variable. Personal pronouns are often treated as free variables when they are not bound. The pronoun *it* in *Adam liked it* can been seen as a free variable whose value is assigned by an assignment function that depends on the context. For instance, if we are talking about *clafouti*,[17] a French dessert, and we say *Adam liked it*, it is very likely that the assignment function that will be chosen to interpret the sentence in this case is the one that assigns *it*

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[17] The italics is used here to signal the use of a foreign word without any metalinguistic implications. In other words, here I am using the term *clafouti* to refer to the tasty French dessert and not to the term itself.

the entity *clafouti* as its denotation. Once an entity is assigned to *it*, then the sentence *Adam liked it* can receive a truth value. We may wonder why the same mechanism does not apply to the IP of a DP-like standard FR. When we have an open formula like the logical form for *Adam liked t₁* in (31.(31), we cannot just interpret it by means of a (contextually) determined assignment function, so that *Adam liked it* and *Adam liked t₁* would end up being synonymous. This shows that free variables do not all behave the same semantically. Free variables of traces of wh-words cannot be assigned a value by means of an assignment function that is contextually determined. In other words, they need to be bound at a certain point of the semantic derivation.

I am assuming that the variable introduced by a wh-word can take either an atomic or a plural entity as its value. In other words, I am assuming that the lexical meaning of (some) predicates is such that their denotation can contain both atomic and plural entities. This is slightly different from Link's (1983) treatment of nominal predicates. As we saw in § 2.4.1.1, Link assumes a plural predicate, i.e. a predicate with plural entities in its denotation, to be the result of a pluralization operation that applies to the corresponding singular predicate. For instance, the singular nominal predicate *peanut* denotes a set of atomic entities, while the corresponding plural nominal predicate *peanuts* denote a set of plural entities.

I am also assuming that non-nominal predicates contain both atomic and plural entities in their denotation, just to make the semantic derivations we are dealing with look simpler. A possible alternative, closer to Link's original idea, would be to assume that the meaning of wh-words is such that they trigger semantic pluralization of the predicate they

apply to. More precisely, the denotation of wh-words in (33.3) would be replaced with (35).

(35) a. $wh_1 \rightarrow \lambda X \lambda x_1 [\pm animate'(x_1) \wedge {}^*X(x_1)]$
   b. $*$ is an operator that applies to a singular one-place predicate, i.e. a predicate that denotes a set of atomic entities, and turns it into a plural predicate that denotes a set containing both atomic and plural entities.

STEP 2. CP₁ level. I assume that the complementizer C of a wh-clause, which I called λ_1 in (32), is not semantically inert. It inherits the same index as the wh-word in its Spec position (by Spec-Head agreement?) and triggers λ-abstraction over a coindexed free variable at logical form (cf. the rule in (34)). In other words, the semantic composition of λ_1 with its IP sister turns a truth value whose value depends on an assignment function (this is the semantic value of the open formula in IP) into a set of entities whose extension is independent of any assignment function (33.4). This is how the free variable introduced in the logical representation of a DP-like standard FR is bound.

The second crucial assumption at the CP₁ level concerns the semantic contributions of wh-words like *who* and *what*. I assume that they denote a function that applies to a set of entities and returns a subset of it. The intuition behind this is simple. What a wh-word like *what* does semantically is to apply to a set of entities and return the subset of those entities that are inanimate. [c' *Adam liked t₁*] denotes the set of animate and inanimate entities that Adam liked, while [cp *what₁ Adam liked t₁*] denotes only the set of inanimate things that Adam liked. Similarly, *who* applies to a set of entities and returns the subset that contains only animate things. The representation of *who* and *what* (and their cross-linguistic equivalents) at logical form (lf) is given in (36).

(36) *lf representation of* who *and* what
  a. *who$_1$* → $\lambda X \lambda x_1[+\text{animate}'(x_1) \wedge X(x_1)]$
  b. *what$_1$* → $\lambda X \lambda x_1[-\text{animate}'(x_1) \wedge X(x_1)]$

STEP 3: CP$_2$ level. By definition, DP-like standard FRs have the same distribution as DP arguments. Therefore, they always occur where entity-denoting expressions (type <e>) are selected. But the CP$_1$ of a DP-standard FR denotes a set of entities (type <e,t>), rather than an entity. In order to deal with this type-mismatch, I assume that DP-standard FRs can shift from denoting a set of entities (type <e,t>) to denoting its maximal entity (type <e>). The way I implement this change in the syntactic representation is by means of a covert lexical element δ in CP adjunct position (33.4) that combines with CP$_1$ (33.6). § 2.4.2.2.3 is devoted to a discussion of δ and the conditions under which it can occur.

2.4.2.2.2 DP-like free relatives introduced by *where*, *when*, and *how*

DP-like standard FRs introduced by *where*, *when*, and *how* and DP-like standard FRs introduced by *who* and *what* have the same distribution, but differ as far as the syntactic nature of their internal gap is concerned. The gapped position of DP-like standard FRs introduced by *who* or *what* has the same properties as the position the whole FR occurs in, i.e. a DP argument. For instance, the DP-like standard FR introduced by *what* in *Jie ate* [FR *what$_1$* t$_1$ *was on the table*] occurs in an DP argument position (i.e. direct object) and its wh-trace t$_1$ occurs in a DP argument position (i.e. subject) as well. This similarity is crucial for our semantic derivation. Since the wh-trace is in a DP-argument position, it has type <e>. When λ-abstraction applies at the IP level, the result is a set of entities <e,t>. Finally, type-shifting takes place and we end up with the whole FR having type

<e>, the same as the wh-trace.

This is not the case for the gap in DP-like standard FRs introduced by *where*, *when*, and *how*. While the whole FR occurs in a DP argument position, its wh-trace occurs in an adjunct position or in a PP complement position. For instance, the DP-like standard FR introduced by *where* in *I really liked* [FR *where1 we had dinner* t1 *last week*] occurs in a DP argument position (i.e. direct object), while its wh-trace occurs in a PP adjunct position (cf. *We had dinner at Alto Palato last week*). Whatever the semantic type of a PP argument or adjunct is, it cannot be the same as the type of a DP argument. I will say more about this issue in Chapter 3, where PP-like standard FRs will be discussed. For now, I will not go into the details of the semantic derivation of DP-like standard FRs introduced by *where*, *when*, and *how*. I will just notice that they exhibit maximality as well, i.e. they cannot refer to anything smaller than a maximal entity: *where* introduces DP-like standard FRs that denote maximal places, *when* maximal times/occasions/situations, and *how* maximal manners (cf. 2.4.1.2).

Once again, the way I am going to prove this is by showing that these DP-like standard FRs pattern like definite DPs, which we are assuming always refer to a maximal entity, and unlike indefinite DPs, which can refer to something smaller. For instance, if we had dinner at three different restaurants last week and I particularly liked one of them, but not the others, then I can felicitously utter (37a) with the indefinite DP *a place we had dinner last week*.

(37) a. I really liked [Indefinite DP a place where we had dinner last week].
    b. I really liked [Definite DP the place(s) where we had dinner last week].
    c. I really liked [FR where we had dinner last week]. (≠ a; = b)

On the other hand, if we replace the indefinite DP with the corresponding definite one, as in (37b), the resulting sentence would be infelicitous, if uttered in this situation. It would either incorrectly presuppose that we went to only one restaurant last week (singular definite DP) or wrongly assert that I really liked all three restaurants we went to (plural definite DP). What about the corresponding DP-like standard FR introduced by *where* in (37c)? It is as infelicitous as (37b). Similar examples are given for DP-like standard FRs introduced by *when* and *how* in (38) and (39), respectively.

(38) a. I really liked [$_{\text{Indefinite DP}}$ one time we had dinner at *Pizzicotto*].
    b. I really liked [$_{\text{Definite DP}}$ the time(s) we had dinner at *Pizzicotto*].
    c. I really liked [$_{\text{FR}}$ when we had dinner at *Pizzicotto*]. ($\neq$ a; = b)

(39) a.* I don't like [$_{\text{Indefinite DP}}$ a way you talk to her].
    b. I don't like [$_{\text{Definite DP}}$ the way(s) you talk to her].
    c. I don't like [$_{\text{FR}}$ how you talk to her]. ($\neq$ a; = b)

In conclusion, DP-like standard FRs introduced by *where, when* and *how* exhibit the same maximality effects as DP-like standard FRs introduced by *who* and *what*.

2.4.2.2.3 On δ

Let us go back to the lexical meaning of δ in (33.4), repeated in (40) below. δ combines with a set-denoting XP to return the maximal individual of the set denoted by XP.

(40) $\delta \rightarrow \lambda X \sigma x[X(x)]$

I assume that two conditions need to be satisfied in order for δ to be licensed: 1) the set that XP denotes must have a maximal entity, and 2) lexical blocking cannot apply. I will discuss both in turn.

Condition 1: maximal entity. In order for δ to combine with the CP$_1$ of a DP-like

standard FR, CP$_1$ has to denote a set containing its maximal entity. But under which conditions do DP-like standard FRs denote a set containing its maximal entity? The answer I am going to suggest is rather simple: always, as long as the atomic entities of the set are <u>sortally homogeneous</u>. I tentatively suggest that the five phrasal wh-words *who*, *what*, *where*, *when*, and *how* (and their equivalents across languages) are related to five basic categories that entities are sorted into: animate things, inanimate things, places, times, and manners, respectively. So when phrasal wh-words are semantically combined with their set-denoting sister C', they make the set that C' denotes sortally homogenous. For instance, as we already saw, [$_{C'}$ *Adam liked t$_1$*] denotes the set of entities (i.e., animate things, inanimate things, places, times, and manners) that Adam liked, while [$_{CP}$ *what$_1$ Adam liked t$_1$*] denotes only the set of inanimate things that Adam liked. My claim is that while the set of inanimate things that Adam liked has a maximal entity, the set of entities of different sorts that Adam liked does not. The intuition behind this claim is that entities can be summed to form bigger entities only if they are of the same sort. We can conceive the sum of two animate things like Jie and Adam as a new entity, the plural entity Jie⊕Adam. Here is some evidence in favor of this claim. First, we can attribute properties to Jie⊕Adam that do not pertain to either Jie or Adam. For instance, we can perfectly understand *Jie and Adam met*, while *Jie met* or *Adam met* do not make sense. Second, our lexicon has plenty of nouns that can be used to refer to Jie⊕Adam: *the two <u>guys</u>*, *the two UCLA <u>linguists</u>*, etc. (I am assuming that nouns only denote sortally homogeneous sets). Now what happens if we consider an animate thing like Adam and a place like Berlin together? Although the pairing is not random at all, since Adam loves

Berlin and he has been there many times, still there is no property that can be attributed to Adam and Berlin as a unit without being distributed over each of them. Also, there does not seem to be any noun that we can use to refer to both of them together, not even an extremely generic noun like *thing*. *The two things I love the most are Adam and Berlin* sounds at least awkward.

   Condition 2: **overt lexical blocking**. The covert lexical element δ cannot occur with an XP if there is another lexical item in the lexicon that 1) is overt, 2) has the same denotation as δ, and 3) can occur with XP. I call these three conditions together **overt lexical blocking** (cf. Chierchia (1998). Overt lexical blocking prevents δ from occurring indiscriminately with any set-denoting expressions in the language. For instance, the noun *peanut* denotes a set of entities (i.e. peanuts). Without overt lexical blocking, *Adam ate peanut would be predicted to be acceptable, since δ could combine with *peanut* and δ *peanut* would result in an entity-denoting expression. But the presence of the overt determiner *the* in the lexicon blocks the occurrence of δ, because the semantic contribution of *the* according to Link (1983) is exactly the same as δ. On the other hand, δ can combine with the CP$_1$ of a DP-like standard FR because the determiner *the* cannot take a CP complement.

   The acceptability of *Adam ate peanuts* is not a counter-examples (cf. Chierchia (1998) and Dayal (in progress) for a detailed discussion). *Adam ate peanuts* is not semantically equivalent to *Adam ate the peanuts*. Therefore, if any covert determiner at all is licensed with bare plurals like *peanuts*, it has different semantic property from δ.

   We have seen under which conditions δ can apply. But why do we need δ at all? And

why does δ have the meaning of a definite determiner rather than the meaning of any other determiner? I will briefly touch on both questions.

Question 1: Why δ? δ is needed to repair a type-mismatch. By definition, DP-like standard FRs have the same distribution as DP arguments. Therefore, they always occur where entity-denoting expressions (type <e>) are selected. But, according to the analysis I am proposing, the CP_1 of a DP-like standard FR denotes a set of entities (type <e,t>). The reason why I am arguing that CP_1 denotes a set and not an entity will become clear in the next chapters. There I will show that there are at least three kinds of FRs that clearly do not denote an entity and whose semantic behavior can be more easily accounted for if their CP_1 denotes a set: existential FRs (Chapter 3), PP-like standard FRs (Chapter 3), and *-ever* FRs (Chapter 4).

Question 2: Why such a denotation for δ? According to my proposal, δ has basically the same denotation as a definite determiner, the only difference being that it applies to a set that can contain both atomic and plural individuals, while the definite determiner can apply only to one or the other, at least in English. One simple reason why I assigned δ that denotation is because it gives the correct semantics for DP-like standard FRs. But I think a more principled point can be made as well. The CP_1 of a DP-like standard FR and of a FR in general always denotes a set of entities, while a DP-like standard FR always denotes <u>the</u> maximal entity of that set. Why does a DP-like standard FR not denote <u>some</u> entity, or <u>every</u> atomic entity, or <u>most</u> entities, etc. among the ones in the set denoted by its CP_1. The hypothesis that I would like to suggest is that only <u>overt</u> lexical items can trigger quantification over a set. Going from a set to its maximal entity is the "best"

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strategy to solve the type-mismatch between a predicate and its DP-like standard FR argument without quantifying over the set denoted by the CP₁ of a DP-like standard FR. It is the best strategy because there is very little information that is lost going from a set to its maximal entity. By definition, all the members of a set are 'part of' its maximal entity. What is lost going from a set to its maximal entity is the bottom of the set. In other words, two non-identical sets can have the same maximal entity. For instance, if Andrea, Luca, Emanuele, and Sacha were all the people at the dinner and each of them kissed and was kissed by at least one of the other, then the maximal entity of the set of the people at the dinner (Andrea⊕Luca⊕Emanuele⊕Sacha) and the maximal entity of the people that kissed each other at the dinner (Andrea⊕Luca⊕Emanuele⊕Sacha) is the same, although the two sets are not identical. The set of people at the party has the atomic entities Andrea, Luca, Emanuele, and Sacha as its smallest members (i.e. its "bottom"), while the set of people who kissed each other at the dinner does not, since kissing each other does not distribute over atomic entities (e.g. Andrea cannot kiss each other).

The idea that maximalization applies as a default operation is largely inspired to Chierchia's (1998) and Dayal's (in progress) proposals of a ranking between type-shifting operations. Their ι type-shifter is very close to our σ. Chierchia argues that the type-shifting operation *nom* is ranked higher than ι and ∃, which are ranked at the same level. Dayal convincingly shows that *nom* and ι should be ranked at the same level, both higher than ∃. I refer the reader to the two mentioned works for more details.

To sum up, the covert lexical item δ is required to repair the type-mismatch between

the CP$_1$ of a DP-like standard FR and the selectional requirements of the matrix predicate. The denotation of δ is basically the same as a definite determiner, because this is the only way to repair the type-mismatch without quantifying over the set denoted by CP$_1$. The background assumption here is that quantification can only be triggered by overt lexical items, and not covert ones like δ.

Two conditions have to be satisfied for δ to occur: 1) the XP that δ combines with has to denote a set containing its maximal entity, and 2) there is no overt lexical item with the same denotation as δ that can combine with XP (overt lexical blocking).

2.4.2.2.4 On the semantic contribution of wh-words: differences with Jacobson (1995)

As discussed earlier (§ 2.4.2.2.1.2: Step 2), I assume that *who* and *what* (and their cross-linguistic equivalents) denote a function that applies to a set of entities and returns a subset of it. I repeated their representations at logical form (lf) in (36).

(41) *lf representation of* who *and* what *according to my proposal*
    a. *who$_1$*   ⇢ $\lambda X \lambda x_1[+\text{animate}'(x_1) \wedge X(x_1)]$
    b. *what$_1$* ⇢ $\lambda X \lambda x_1[-\text{animate}'(x_1) \wedge X(x_1)]$

The semantic contribution of wh-words represents a crucial difference between my proposal and Jacobson's (1995). She assumes that wh-words denote a function from a set to the singleton set containing the maximal entity of the original set. In (42), I gave the lf representation of *who* and *what* according to Jacobson's proposal. (I slightly adapted the original formulation in her example (56) to make the comparison with my own proposal clearer.)

(42) *lf representation of* who *and* what *according to Jacobson (1995)*

    a. *who*$_1$ → $\lambda X \lambda x_1 [+\text{animate}'(x_1) \wedge X(x_1) \wedge \forall y[[+\textbf{animate}'(\textbf{y}) \wedge \textbf{X(y)}] \rightarrow \textbf{y} \leq \textbf{x}_1]]]$

    b. *what*$_1$ → $\lambda X \lambda x_1 [-\text{animate}'(x_1) \wedge X(x_1) \wedge \forall y[[-\textbf{animate}'(\textbf{y}) \wedge \textbf{X(y)}] \rightarrow \textbf{y} \leq \textbf{x}_1]]]$

The difference between (41) and (42) is just the component in bold in (42). It adds the condition that every other entity y that has the same relevant properties (±animate and X) as x_1 will be "smaller" or "part-of" x_1. In other words, x_1 is required to be the maximal entity of the set of entities that have the relevant properties. So, the crucial difference between my proposal and Jacobson's is that she incorporates the maximality of DP-standard FRs (i.e. the fact that they refer to a maximal entity) into the lexical meaning of their wh-words. This move makes a clear prediction: maximality should be observed in any kind of wh-clause that makes use of those wh-words. This prediction is not borne out. In Chapter 3, I will discuss two counterexamples to Jacobson's proposal: existential FRs and PP-like standard FRs.

2.4.3. Conclusions

Following Jacobson (1995), we showed that DP-like standard FRs always denote maximal entities, as definite DPs do according to Link (1983). In doing so, we proved the generalization we started with in (14): DP-like standard FRs always denote a maximal entity, therefore they always denote an entity.

We then derived this result compositionally by means of the following assumptions: 1) DP-like standard FRs are CPs; 2) their IP translates into an open formula with the trace of the wh-word introducing a free variable; 3) when their IP combines with the complementizer C, λ-abstraction applies and C' turns into a set-denoting expression;

4) the wh-word makes that set sortally homogeneous (all animate things or all inanimate things); 5) a covert element δ combines with the CP and changes the overall denotation from a set to the maximal entity of that set.

2.5. Against other proposals about the semantics of DP-like standard free relatives

2.5.1. DP-like standard FRs as both definites and universals

According to Cooper (1983), DP-like standard FRs[18] are ambiguous between a universal interpretation and a definite interpretation. For instance, the two readings for the FR in (43a) could be paraphrased as in (43b) (universal reading) and (43c) (definite reading).

(43) a. Jie ate [**FR** what Adam cooked].
   b. = Jie ate [**Universal DP** everything Adam cooked]. *Universal Reading*
   c. = Jie ate [**Definite DP** the thing Adam cooked]. *Definite Reading*

Cooper's (1983) analysis of DP-like standard FRs is part of a more general semantic analysis of all wh- clause types in English. He assumes that wh- words like *who*, *what*, *which* in wh-INTs, standard FRs and HRs are all semantically identical and denote the identity function (they may also impose some restrictions on their domain, like ± animate). All wh- clauses denote a function characterizing a set of entities. For instance, all the embedded wh- CPs in (44) denote the set of things that Adam cooked (cf. (44).

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[18] Cooper (1983) does not discuss PP-like standard FRs nor *-ever* FRs. Since he is mainly concerned with English, he does not deal with existential FRs either.

(44) a.　　Jie ate [$_{DP}$ [$_{CP}$ what$_i$ Adam cooked t$_i$]].

　　 b.　　Jie ate [$_{DP}$ the food [$_{CP}$ which$_i$ Adam cooked t$_i$]].

　　 c.　　Jie wonders [$_{wh\text{-INT}}$ [$_{CP}$ what$_i$ Adam cooked t$_i$]].

(45) CP ⇝ λx[cook'(x)(a)]

The CP in DP-like standard FRs is then mapped into a DP at the syntactic level and into a DP-like meaning at the level of semantic interpretation. Since FRs can be either definites or universals, two semantic rules need to be assumed to interpret DP-like standard FRs (cf. (46).

(46) a.　　Universal Rule:　 DP$_{FR}$ ⇝ λX[∀x (CP′(x) → X(x))][19]

　　 b.　　Definite Rule:　　 DP$_{FR}$ ⇝ λX[X(ιx[CP′(x)])]

As Jacobson (1995) points out, a main theoretical problem with this approach is that no principled reason is given why DP-like standard FRs should be interpreted with the semantic rules in (46) above rather than others. What would prevent us from adding a third semantic rule like the one in (47) that would turn DP-like standard FRs into existentially quantified expressions? In other words, why can't we paraphrase (43a) also with *Jie ate something Adam cooked*?

(47) (Hypothetical) Existential Rule:　 DP$_{FR}$ ⇝ λX[∃x (CP′(x) ∧ X(x))]

Cooper's (1983) proposal is also undermined by a serious empirical problem. His claim that DP-like standard FRs can behave like universals cannot be correct. Standard FRs show quantificational variability effects, while truly quantified expressions do not. For instance, (48a) contains both a FR and an adverb of quantification like *for the most part*.

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[19] CP′ is a short form for the translation in logical form of the CP of a standard FR.

In a situation in which Adam cooked many things for Thanksgiving, (48a) means that Jie ate most of the things that Adam cooked for Thanksgiving. (48b) is identical to (48a) except that the FR has been replaced with a HR that is headed by a universally quantified expression like *everything*. The resulting sentence is uninterpretable. (49a-b) make a similar point for Italian by using a DP-like standard FR introduced by *chi* 'who' and the adverb of quantification *raramente* 'rarely'.

(48) a. Jie <u>for the most part</u> ate [<u>what</u> Adam cooked for Thanksgiving].
      b. # Jie <u>for the most part</u> ate [<u>everything</u> Adam cooked for Thanksgiving].

(49) a. [<u>Chi</u> è meridionale] <u>raramente</u> è alto e   biondo.
          who is Southerner   rarely   is tall and blond
          'Italians from the South are rarely tall and blond.'
      b. # [<u>Ogni</u> meridionale] <u>raramente</u> è alto e   biondo.
           every Southerner   rarely   is tall and blond
          ('Every Italian is rarely tall and blond.')

2.5.2. DP-like standard FRs as indefinites

2.5.2.1 Berman

Developing a suggestion in Nishigauchi (1986; 1990), Berman (1991, 1994) argues that wh-phrases behave like indefinites, according to the analysis of indefinites in Lewis (1975), Kamp (1981) and Heim (1982): they both introduce free variables in the logical representation. Berman's argument in favor of his hypothesis is that, according to him, indefinites and wh-phrases exhibit the same quantificational variability effects. The data he provides to support his argument are of the kind in (50).[20]

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[20] (50a,a') from Berman (1994: 5, ex. 2a,3a), (50b,b') from Berman (1994: 49, ex. 38c,39c).

(50) a. [_{Indefinite DP} A quadratic equation] **usually** has two different solutions.
  a'. [_{Quantified DP} **Most** quadratic equations] have two different solutions each.
  b. [_{FR} What Sue paints] is **often** beautiful.
  b'. [_{Quantified DP} **Many** things Sue paints (i.e. many paintings by Sue)] are beautiful.

The sentence in (50a) is truth-conditionally equivalent to the sentence in (50a'), in which the underlined indefinite determiner *a* and adverb of quantification *usually* in (50a) have been replaced with the underlined quantifier *most*. Similarly, the sentence in (50b) is truth-conditionally equivalent to the sentence in (50b'), in which the underlined wh-phrase *what* and adverb of quantification *often* in (50a) have been replaced with the underlined quantified expression *many things*. I will discuss quantificational variability effects in FRs in detail in Chapter 5. Here I will just give the gist of my arguments against an approach à la Berman.

First of all, indefinites and DP-like standard FRs do not pattern alike as far as adverbs of quantity (e.g. *for the most part*) are concerned; DP-like standard FRs pattern like definites.

(51) a. [_{FR} What Sue buys] is **for the most part** expensive.
  b. #[_{Indefinite DP} Something Sue buys] is **for the most part** expensive.
  c. [_{Definite DP} The things Sue buys] are **for the most part** expensive.

Second, indefinites and DP-like standard FRs do not pattern alike in episodic contexts. (52a) and (52b) are not truth-conditionally equivalent. Once again, DP-like standard FRs pattern like definites (cf. (52a) and (52c)).

(52) a. [_{FR} What Sue bought last week] was really expensive.
  b. [_{Indefinite DP} Something Sue bought last week] was really expensive.
  c. [_{Definite DP} The things Sue bought last week] were really expensive.

2.5.2.2 Wiltschko

Wiltschko (1998) claims that wh-words in English FRs are indefinites and that FRs themselves semantically behave like indefinites. As such, they can receive the two readings that indefinites usually receive: a generic reading and a specific reading. According to this view, Cooper's (1983) "universal" reading of FRs is actually a generic reading, while the "definite" reading is just a specific reading.

Wiltschko (1998) supports her claim with many distributional and interpretative arguments. Unfortunately, she does not distinguish between standard FRs and *-ever* FRs, even though most of her arguments work only for *-ever* FRs. Moreover, she does not give an explicit semantics, and thus it is not clear what she really means by "generic" and "specific" readings. If they are supposed to mean what they usually mean for indefinites, it seems unlikely that this can be the correct account for standard FRs. For instance, I think the intuition is quite clear that the definite DP in (53c) is a paraphrase of the standard FR in (53a), while the indefinite DP in (53b) is not. In fact, (53b) can be true when (53a) and (53c) are not. Imagine the situation in which Adam cooked ten different things for Thanksgiving and Jie ate only one of them. In this situation, it would be appropriate to utter (53b) with the singular indefinite, while (53a) and (53c) would be clearly false.

(53) a.   Jie ate [FR what Adam cooked for Thanksgiving].
     b.   I ate [DP a certain thing / things Adam cooked for Thanksgiving].
     c.   I ate [DP the thing(s) Adam cooked for Thanksgiving].

Gutiérrez-Rexach (1999) suggests a similar analysis for Spanish FRs, but only for standard FRs.

2.6. On the syntactic nature of standard free relatives

Standard FRs exhibit a puzzling mix of syntactic properties: 1) they look like clauses, but 2) have the distribution of DPs or PPs (at least most of the time) and 3) satisfy peculiar "matching" requirements. We already discussed the first two properties in Chapter 1. There we saw that standard FRs can be identical to wh-INTs and can always be replaced with DPs or PPs. As for "matching" requirements, it would be enough for our purposes to say that the wh-phrase of a standard FR has to satisfy/match some morpho-syntactic requirements of the matrix clause. And this is true crosslinguistically. For instance, (54a) is unacceptable because the standard FR is in the complement position of the matrix predicate *cooked* and category matching would require the syntactic category of the wh-phrase to match the syntactic category of the complement that *brought* selects for. But *with what* is a PP, while *brought* selects for a DP. If we avoid the mismatch by stranding the preposition, the result is fully acceptable (54b). Notice that this contrast cannot be due to the fact that preposition pied-piping is disfavored over preposition stranding in English. (54c), with an embedded wh-INT, is judged much more acceptable than (54a), with an identical embedded FR, though the prepositions have been pied-piped in both embedded clauses.

(54) a. * I finally cooked [FR [PP with what] I can make that cake].
    b.   I finally cooked [FR [DP what] I can make that cake with].
    c. ? I wonder [wh-INT [PP with what] I can make that cake].

More generally, categorial matching effects with standard FRs are found in languages that never allow preposition stranding.

Besides categorial matching effects, FRs sometimes exhibit "case matching", in

languages whose wh-words are inflected for case. In these languages, the wh-word in a standard FR has to satisfy/match the case requirements of both the FR and its matrix clause. I refer to van Riemsdijk (2000: § 4) for a detailed discussion of "matching" in FRs.

The many proposals that have been suggested to deal with the puzzling syntactic nature of standard FRs can be divided into two groups: the **FR-as-HR proposals** and the **FR-as-wh-INT proposals**. The FR-as-HR proposals argue that FRs are DPs or PPs embedding a CP, as shown in (55); in other words, FRs end up looking syntactically very similar to HRs.

(55) *FR-as-HR proposals*

    a.   DP/PP   or   b.   DP/PP

        [HEAD wh-] CP   [HEAD e]   CP

                                                  wh-
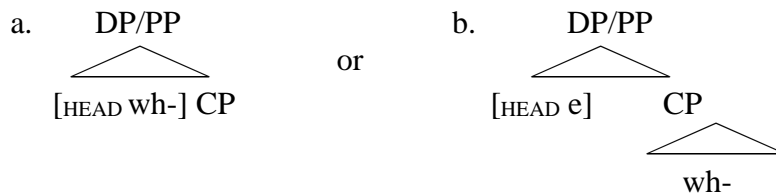
On the other hand, the accounts I have grouped under the label FR-as-wh-INT all propose that FRs are just CPs, i.e. they are syntactically (almost) identical to wh-INTs, as shown in (56).

(56) *FR-as-wh-INT proposals*

      CP

    wh-
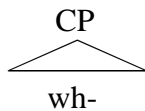
The FR-as-HR proposals can easily account for the distributional facts: standard FRs have the same distribution as DPs or PPs because, like HRs, they are complex DPs or PPs. But then it becomes difficult to explain why FRs look like CPs. What all these

proposals end up doing is either postulating an empty (pronominal) HEAD (cf. (55b))[21] or assuming that the wh-phrase is (generated or moved) outside the FR itself and acts like the HEAD of a HR (cf. (55a))[22].

On the other hand, the FR-as-wh-INT proposals can easily account for the clausal "look" of FRs, but have a hard time giving a syntactic explanation of their distribution. Ad hoc nominal or preposition-like properties have to be postulated about the C head and the CP projection of FRs.[23]

Finally, categorial and case matching effects are a serious problem for both approaches. All the proposals I am aware of can deal with them only by means of ad-hoc assumptions or radical changes in the theory.

2.7. Conclusions

Before concluding, I will briefly highlight the main points of this chapter. I started by defining standard FRs and suggesting a distinction between DP-like standard FRs and PP-like standard FRs. Following Jacobson (1995), I showed that a DP-like standard FR always denotes a maximal entity, as a definite DP does according to Link (1983). The way I derived this result compositionally crucially differs from Jacobson's.

According to Jacobson, a wh-word like *what* denotes a function that applies to a set of entities and returns the singleton containing the maximal entity of the original set. This is

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[21] Cf. Groos and van Riemsdijk (1981), Hirschbühler and Rivero (1981; 1983), Rivero (1984; 1986), Harbert (1983), Suñer (1983-84; 1985), and Grosu (1989, 1994, 1996).

[22] Cf. Grimshaw (1977), Bresnan and Grimshaw (1978), Larson (1987; 1998), Kayne (1994), and Iatridou, Anagnostopoulou and Izvorski (1999).

[23] Cf. Acquaviva (1989), Rooryck (1994), Donati (1997), Caponigro (2002).

the basic denotation of the CP of FRs. Then, a type-shifting operation applies (iota) to turn the set into its only entity. In other words, Jacobson encodes maximality into the lexical meaning of wh-words and, therefore, predicts that <u>every</u> construction that makes use of those wh-words should exhibit maximality.

On the other hand, I assumed that a wh-word like *who* or *what* denotes a function that applies to a set of entities and returns a sortally homogeneous subset (all animate things or all inanimate things). Then, a covert element δ combines with the CP and changes its denotation from a set to the maximal entity of that set. In the next chapters, I will show that, unlike Jacobson's, my approach to the meaning of wh-words can be used to account for the semantic behavior of <u>non-maximal</u> FRs like existential FRs and PP-like standard FRs. Although δ is not completely meaning-preserving (unlike Jacobson's iota), I suggested that going from a set to its maximal entity is the "best" strategy to solve the type-mismatch between a predicate and its DP-like standard FR argument without quantifying over the set denoted by the CP_1 of a DP-like standard FR. It is the best strategy because there is very little information that is lost going from a set to its maximal entity. By definition, all the members of a set are 'part of' its maximal entity, if the set contains it.

Then, I discussed some of the problems with those approaches that do not treat DP-like standard FRs as denoting a maximal entity. Finally, I briefly durveyed the main proposals about the syntactic structure of DP-like standard FRs to conclude that this is still an open issue since no proposal is really satisfactory. Therefore, my assumption that all FRs are just CPs is as problematic as the other proposals, but at least reduces the number of

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ad-hoc assumptions.

CHAPTER 3

Non-maximal Free Relatives:

Existential Free Relatives and PP-like Standard Free Relatives

3.1. Introduction

In this chapter, I discuss two kinds of FRs that were both briefly introduced in Chapter 2: existential FRs and PP-like standard FRs. The property that these FRs have in common that makes them extremely important for the present work is that neither of them has to be interpreted as maximal, i.e. neither of them has to refer to a maximal entity. More precisely, existential FRs never refer to a maximal entity, while PP-like standard FRs may not. This is different from what we concluded about DP-like standard FRs in Chapter 2. On the other hand DP-like standard FRs, existential FRs and PP-like standard FRs can all be introduced by the same wh-words.

These similarities and differences are the reason why I am discussing existential FRs and PP-like standard FRs in the present work. They both support and strengthen the conclusions about the semantic contribution of wh-words that we reached in Chapter 2. Wh-words do not lexically encode maximality, otherwise they could not occur in non-maximal constructions like existential FRs and PP-like standard FRs. On the other hand, as we have already discussed in Chapter 2, wh-words cannot lexically encode any existential force, otherwise we would not be able to account for maximality when it shows up in standard FRs. By looking at both DP-like standard FRs on the one hand and existential FRs and PP-like standard FRs on the other, we can conclude that the lexical

meaning of wh-words must be free of any maximality or quantificational force.

The chapter is structured in two main parts. In the first part, I deal with existential FRs (§ 3.2). I start with a definition (§ 3.2.1) and by briefly mentioning what little has been said on existential FRs in the literature (§ 3.2.2). Then I show why they are FRs according to the definition in Chapter 1 and give some examples across languages (§§ 3.2.3-3.2.4). I discuss the properties of the small class of predicates that introduce existential FRs (§ 3.2.5) and the similarities between the scopal behavior of existential FRs and non-specific indefinite DPs (§ 3.2.6). I then propose a semantic analysis of existential FRs that makes them very similar to standard FRs, the only crucial difference being the different properties of the position in which they occur inside the matrix clause. This analysis will account for three main properties of existential FRs: 1) the fact that they are a kind of FR, 2) the fact that they can occur only as complements of a limited number of predicates, and 3) the fact that they can always be replaced and paraphrased with non-specific indefinite DPs (§ 3.2.7). Finally, I briefly discuss the other proposals on the semantics of existential FRs that I am aware of (§ 3.2.8).

The second part is about PP-like standard FRs, in particular the ones that do not show maximality (§ 3.3). This part is much shorter since I do not yet have a worked-out compositional semantic analysis for PP-like standard FRs. Nevertheless, the data clearly show that PP-like standard FRs can be interpreted as non-maximal (§ 3.3.3). This is already enough to make PP-like standard FRs a convincing argument against an approach to maximality that encodes it in the lexical meaning of wh-words.

3.2. Existential FRs

3.2.1. A definition

What I labeled **existential FRs** are FRs that occur in the complement position of certain

existential predicates and can be replaced and paraphrased with indefinite DPs. Although

not found in English, existential FRs are attested in many other languages. Examples

from Hebrew are given in (1).[1]

(1) a. le-mazali   yesh li [FR im   mi le-daber] kshe-ani acuva.   *Modern Hebrew*
         to-luck-my have to-me with who to-talk   when-I   sad.F
         'Fortunately, I have somebody to talk to when I am sad.'
     b. al tid'ag --   yesh lanu [FR ma   li-kro].
         don't worry have to-us   what to-read
         'Don't worry! We have something to read.'
     c. eyn   li [FR eyfo   le-histater] be-mikre xerum.[2]
         not-have to-me where to-hide   in-case   emergency
         'I don't have a place where I can hide myself in case of danger.'
     d. mafti'a   she-yesh la   [FR matay li-kro   sfarim].
         surprising that-have to-her   when   to-read books
         'I am surprised she has (some) time to read.'
     e. ani micta'er: eyn   li [FR eyx la-asot et   ze].[3]
         I   apologize not-have to-me how to-do   ACC it
         'I am sorry, but I don't have a way to do it.'
     f.* eyn   li [FR lama la-asot et   ze].
         not-have to-me why to-do   ACC it
         ('I don't have any reason to do it.')

Each example in (1) has a different phrasal wh-word. *lama* 'why' is the only wh-word

that cannot occur in existential FRs (1f). This is the same pattern we observed in standard

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[1] Thanks to Daphna Heller, Orr Ravitz, and Yael Sharvit for the data.

[2] Existential FRs introduced by *eyfo* 'where' are judged colloquial by one of my consultants.

[3] Existential FRs introduced by *eyx* 'how' are judged very colloquial by one of my consultants (the same one as in fn.2).

FRs in Hebrew (cf. Chapter 1, § ??). The similarities and differences between existential FRs and standard FRs are not peculiar to Hebrew. It is true across languages that existential FRs are introduced by the same wh-words as standard FRs, but, unlike standard FRs, they can occur only in the complement position of a very restricted class of predicates and cannot be paraphrased with definite DPs, i.e. they never refer to a maximal entity.

3.2.2. Existential free relatives in the literature

Existential FRs have not received as much attention in the literature as standard FRs. Existential FRs in French, Spanish and Catalan are briefly mentioned in Hirschbühler (1978: 168-170), Hirschbühler and Rivero (1981), and Suñer (1983-1984: 361-363), where they are called 'infinitival free relatives'. Plann (1980: Ch. 3, 4) has a detailed syntactic discussion of existential FRs introduced by *quien* 'who' and *que* 'what' in Spanish. Ramos-Santacruz (1994) argues that existential FRs in Spanish, which he calls 'nonspecific free relatives', behave like non-specific indefinites and therefore must be headed by 'a yet unidentified empty category'. Pesetsky (1982: 149-157) and Rappaport (1986) discuss existential FRs in Russian. Rudin (1986) deals with existential FRs in Bulgarian, which she calls INDEF and assumes not to be FRs. Grosu (1994: 137-142) briefly discusses the syntactic properties of existential FRs, which he calls 'irrealis free relatives', in Spanish, Romanian and Modern Hebrew. Grosu and Landman (1998: 155-158), Izvorski (1998), Pancheva Izvorski (2000: Ch.2) and Grosu (to appear) are the only studies I am aware of that deal with the semantic properties of existential FRs. I will discuss each of them later. In particular, Grosu (to appear) is the most comprehensive

piece of work on existential FRs so far. It contains an extensive discussion of the cross-linguistic distribution and syntactic/semantic properties of existential FRs, which are called 'modal existential wh-constructions', with plenty of data from many languages. Some of the previous literature is summarized and a semantic analysis, which I will discuss later, is suggested for existential FRs. I will often refer back to this paper and I recommend it to the interested reader.

3.2.3. Existential free relatives are free relatives

According to the definition in Chapter 1, existential FRs are free relatives: 1) they are introduced by a wh-word or wh-phrase, 2) they are clauses with a gap in argument or adjunct position, and 3) they can always be replaced with truth-conditionally equivalent DPs. For instance, the bracketed string in (2a) is a FR because it has the wh-phrase *con chi* 'with who' in initial position, it is a clause with a PP gap,[4] and it can be replaced and paraphrased with a DP (2b).

(2) a. Ho [FR con chi parlare]   quando sono triste.   *Italian*
        have.1S with who speak.INF when am   sad
        'I have somebody to talk to when I am sad.'
    b. Ho [Indefinite DP qualcuno con cui parlare]   quando sono triste.
        have.1S   somebody with RP speak.INF when am   sad
        'I have somebody to talk to when I am sad.'

3.2.4. Existential free relatives cross-linguistically

Existential FRs are not found in English or in the other Germanic languages ((3)-(5)), except for Yiddish ((6), (7)) and New York English (8), but they are widely attested in

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[4] Whether the gap is an argument or adjunct depends on the assumptions about the selectional properties of a predicate like *parlare* 'to talk'.

Romance (at least, Italian, Spanish, Catalan, Portuguese, French, Romanian ((9)-(13))),

Slavic (at least, Russian, Polish, Bulgarian, Serbo-Croatian, and Macedonian ((14)-(18))),

Modern Greek (19), Albanian (20), Finno-Ugric (at least, Hungarian (21), Estonian (22),

and Finnish (23), Modern Hebrew (1), and Moroccan Arabic (24). Examples are given in

brackets below.

(3) *Standard Canadian/American English* (Carson Schütze p.c., Harold Torrence p.c.)
    a. *I have [who(m) to talk to] when I am sad.
    b. *I don't have [what to eat].

(4) *German* (Daniel Büring p.c.)
    * Ich habe [mit wem   ich sprechen kann], wenn ich traurig bin.
     I   have with who.DAT I speak   can,   when I sad   am

(5) *Dutch* (Hilda Koopman p.c.)
    * Ik heb [met wie te praten] als ik me triest voel.
     I have with who to talk   if I me sad   feel

(6) *Yiddish* (Adam Albright p.c.)
    Ikh hob nit [mit vemen   ikh ken reden], az   ikh bin troyerik.
    I   have not with who.DAT I   can speak, when I   am sad
    'I don't have anybody I can talk to when I am sad.'

(7) *Yiddish* (Koysef n.d.)[5]
    […] nisht vayil   es iz   nisht geven [mit vemen   tsu redn].
         not   because it has not   been with who.DAT to speak
    '[…] not because there wasn't anyone one could talk to.'

(8) *New York English* (Nina Hyams p.c.)
    I don't have [what to eat].
    'I don't have anything I can eat.'

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[5] Thanks to Adam Albright for pointing this out to me.

(9) *European and Mexican Spanish* (Maria Arche p.c.; Heriberto Avelino p.c.)
Tengo [con quién hablar] cuando estoy triste.
have.1S with whom speak.INF when am sad
'I have somebody I can talk to when I am sad.'

(10) *Catalan* (Hirschbühler and Rivero 1981: 119 ; Amalia Llombart p.c.)
La pobra no tenia [amb qui parlar].
the.FEM poor.FEM not had.3S with whom speak.INF
'The poor one didn't have anybody she could talk to.'

(11) *European and Brazilian Portuguese* (Móia 1992: 94; Jazon Santos p.c.)
O Paulo não tem [a quem pedir ajuda].
the P. not has to whom ask-for.INF help
'Paulo doesn't have anybody he can ask for help.'

(12) *French* (Hirschbühler 1978: 168; Dominique Sportiche p.c.)
J'ai [de quoi écrire].
I-have of what write.INF
'I have something I can write with.'

(13) *Romanian* (Grosu 1994: 138)
Maria are [cu cine vota].
Maria has with whom vote.INF
'Maria has somebody she can vote for.'

(14) *Russian* (Pancheva Izvorski 2000: 26; Ora Matushansky p.c.)
Est' [s kem pogovorit'].
is with whom talk.INF
'There is somebody with whom one could talk.'

(15) *Polish* (Grosu, to appear: ex. 7)
(Nie) mam [co robić].
not have.1S what do.INF
'There {is something, isn't anything} I can do.'

(16) *Bulgarian* (Rudin 1986: 190)
Toj ima [s kogo da govori].
he has with whom SUBJ talk.3S
'He has somebody he can talk to.'

(17) *Serbo-Croatian* (Alexandra Perovic p.c.; Jelena Krivokapic p.c.)

Nemam   [ga kome   dati].
not-have.1S it   whom.DAT give.INF
 'I don't have anybody I can give it to.'

(18) *Macedonian* (Slavica Kochovska p.c.)

Za sreḱa, imam [so   kogo   da⁶ zboruvam] koga sumtazhen.
for luck   have.1S with whom SUBJ talk.1S   when am sad
'Fortunately, I have somebody I can talk to when I am sad.'

(19) *Modern Greek* (Maria Baltazani p.c.)

Exo   [me pion   na   miliso] otan ime lipimenos.
have.1S with who.ACC SUBJ talk.1S when am sad
'I have somebody I can talk to when I am sad.'

(20) *Albanian* (Grosu, to appear: 11a)

Nuk ka   [kush të   na dërgojë mall].
not have.IMPERSONAL who SUBJ us send.1P merchandise
'There is nobody who can send us the merchandise.'

(21) *Hungarian* (Anikó Lipták p.c.; Anna Szabolcsi p.c.)

Van [kivel   beszélni].
is   who.INS talk.INF
'There is someone with whom one could talk.'

(22) *Estonian* (Lumme Erilt p.c.)

Mul on   [kelle-ga rääkida], kui   ma   kurb olen.
I.ALL have who-COM talk.INF when I.NOM sad   am
'I have somebody I can talk to when I am sad.'

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⁶ The particle *da* is traditionally called a subjunctive marker, therefore I glossed it SUBJ. "It occurs with all persons and all finite verb forms" (Friedman, Victor. 'Macedonian'. In Bernard Comrie & Greville G. Corbett (eds.) *The Slavonic Languages.* London and New York: Routledge, 1993: 271). Thanks to Slavica Kochovska for the quote and the reference.

(23) *Finnish* (Elsi Kaiser p.c.)

    Minulla   on [kenelle puhua]   kun   olen surullinen.
    I.ADE   is who.ALL speak.INF when am sad.
    'I have somebody I can talk to when I am sad.'

(24) *Moroccan Arabic* (Taoufik Afkinich p.c.; Boujemaa Boudali p.c.)

    mən-zfɦər ʕənd-ɪ [mʕa mən   n-ədw-ɪ] məllɪ kan kun hazɪn
    from-luck have.1S with whom 1S-talk-1S when was be.1S sad
    'Fortunately, I have somebody I can talk to when I am sad.'

In conclusion, the distribution of existential FRs across languages by and large resembles the distribution of standard FRs with the exception of a few Germanic languages. Why existential FRs are not attested in all Germanic languages that have standard FRs is not clear to me. It is interesting that Yiddish, one of the two Germanic languages that allow existential FRs, has historically been in contact with Slavic languages that allow existential FRs. The variety of New York English that allows existential FRs is likely to have been influenced by Yiddish, given that its speakers were and some still are Yiddish speakers as well (Nina Hyams p.c.).

3.2.5. Predicates that introduce existential free relatives

Existential FRs can occur only in the complement position of two small classes of predicates: (i) predicates that assert the existence of their complement (the equivalents of existential *be* and existential *have*), and (ii) predicates that assert their complement's 'coming into being, view, or availability, or causation of one of these (for example, *arrive, be born, choose, look for, find, send, obtain,* and *wangle*)' (Grosu, to appear). All languages that have existential FRs license them as complements of predicates of type (i); some also license them with a subset of predicates of type (ii) (the size of the subset

varies from language to language). All the examples so far were with predicates of type (i). Below some examples are given with predicates of type (ii). The reader is referred to Grosu (to appear) for further data and discussion.

(25) *Romanian* (Grosu, to appear: ex. 1.b)
    Îţi   voi   trimite [cu ce   să   speli   rufele].
    you.DAT will.1S send.INF with what SUBJ wash.2S clothes-the
    'I will send you something with which to wash the clothes.'

(26) *Albanian* (Grosu, to appear : ex. 11.b)
    Zgdjodhi [kush ta   zëvendësojë].
    chose.3S   who SUBJ-her   replace.3P
    'She chose someone to take her place.'

(27) *Hungarian* (Grosu, to appear: ex. 5.b)
    Talátál   [mit   enni]?
    found.2S   what.ACC eat.INF
    'Did you find something to eat?'

3.2.6. Existential free relatives and non-specific indefinite DPs

In all the examples above, every existential has been translated in English with an indefinite DP (*somebody/anybody, something/anything*). This is not accidental. Unlike standard FRs, existential FRs can never be replaced and paraphrased with definite DPs, but only with non-specific indefinite DPs. (28a) shows an example of an existential FR in Italian; in (28b), the existential FR has been replaced with an indefinite DP and the result is acceptable, while, in (28c), the existential FR has been replaced with a definite DP and the sentence becomes unacceptable.

(28) a. Non preoccuparti: ogni studente ha [FR <u>con chi</u>   parlare]   in caso di bisogno.
   not worry.IMP   each has   with who speak.INF in case of need
   'Don't worry too much: each of them has somebody to talk to if they need to.'

 b. Non preoccuparti: ognuno di loro ha [DP <u>qualcuno</u>   con cui parlare]   in caso di bisogno.
   not worry.IMP   each of them has   somebody with RP speak.INF in case of need
   'Don't worry too much: each of them has somebody to talk to if they need to.'

 c.* Non preoccuparti: ognuno di loro ha [DP <u>la persona</u> con cui parlare]   in caso di bisogno.
   not worry.IMP   each of them has   the person with RP speak.INF in case of need
   ('Don't worry too much: each of them has the person to talk to if they need to.')

Indefinite DPs that replace existential FRs can never be interpreted specifically. For instance, (28b) cannot be interpreted as asserting that there is just one specific person such that each of them can go and talk to that person, but only that each of them has a potentially different person they can go and talk to. Similar effects can be observed if the matrix predicate is negated: the indefinite DP that replaces the existential FR cannot scope above negation. For instance, the existential FR in (29a) from Italian can be replaced and paraphrased with the indefinite DP in (29b). The sentence in (29b) can never mean that there exists a place where Carlo can hide but he does not have it available, or anything similar.

(29) a. Carlo non ha [FRdove nascondersi   in caso di pericolo].   *Italian*
   Carlo not has   where hide.INF-CL.REFL in case of danger
   'Carlo doesn't have a place where he can hide in case of danger.'
   ≠ #'There is a place where Carlo can hide in case of danger, but he doesn't have it'

 b. Carlo non ha [DP un posto in cui nascondersi   in caso di pericolo].
   Carlo not has   a place in REL hide.INF-CL.REFL in case of danger
   'Carlo doesn't have a place where he can hide in case of danger.'
   ≠ #'There is a place where Carlo can hide in case of danger, but he doesn't have it'

Another way to describe the pattern above is to say that predicates that introduce existential FRs never let their complement scope out. This is basically a generalization to

both existential-*be*-like and existential-*have*-like predicates of Milsark's (1974) observation that the complement position of the *there is* construction is a scope island.

3.2.7. A semantic analysis for existential free relatives

In the previous sections, I showed that existential FRs are 1) a kind of FR (§ 3.2.3), 2) can occur only as complements of a limited number of predicates (§ 3.2.5), and 3) can always be replaced and paraphrased with non-specific indefinite DPs (§ 3.2.6). I will now give a semantic analysis of existential FRs that accounts for these facts without assuming anything more than what is already available from the analysis of standard FRs in Chapter 2.

The main idea that I would like to pursue is that there is no crucial difference between the semantic contribution of the CP of FRs: the only CP node of existential FRs denotes what the CP_1 of DP-like standard FRs denotes: a set of entities. This is why existential FRs are replaceable and paraphrasable with indefinite DPs, which are commonly taken to denote or be able to denote sets of entities.[7] As such, existential FRs can occur only with predicates that take set-denoting expressions as their complements. Intuitions are clear that predicates of type (i) in § 3.2.5 (i.e. the equivalents of existential *be* and *have* across languages) assert the existence of at least one member in the set denoted by their complement (in other words, they lexically encode existential quantification over their complement). For instance, *c'è* 'there's' in (30a) clearly asserts that there exists at least

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[7] Indefinite DPs <u>are</u> set denoting expressions that may undergo existential closure in an approach à la Kamp (1981) or Heim (1982). Indefinites <u>can</u> denote sets after existential disclosure applies in an approach à la Dekker (1993) and Chierchia (1995).

one person who says no all the time, though it is likely that there is more than one. Similarly, existential *ha* 'has' in (30b) asserts that there is a person (maybe more than one) who takes care of Anna Maria's children.

(30) a. C'è [FR chi sà   dire solo no].   *Italian*
       there's who can.3S say   only no
       'There {is somebody/are people} who {says/say} no all the time.'

    b. Anna Maria ha già   [FR chi le   cura   i   bambini].
       Anna Maria has already   who to-her.CL takes-care-of the   children
       'Anna Maria already has somebody who takes care of her children.'

The main difference between *c'è* and *ha* is that the latter also asserts that Anna Maria and the person who takes care of her children are somehow related, the nature of this relation being contextually determined. In other words, *c'è* and, more generally, existential-*be*-like predicates can be looked at as 1-place predicates that take a set-denoting expression as their complement and assert its non-emptiness, along the lines of Milsark (1974). (31) shows a way to state this formally. (Remember that x is a variable over entities, while X is a variable over sets of entities.)

(31) existential-*be*-like predicates: $\lambda X \exists x[X(x)]$

On the other hand *ha* and the other existential-*have*-like predicates cross-linguistically can be seen as 2-place predicates that take a set-denoting expression as their complement and assert both that there is at least one member x in the set denoted by its complement and that x is in a contextually determined relation with the first argument y, as shown in (32). (R_c stands for a contextually determined 2-place relation.)

(32) existential-*have*-like predicates: $\lambda X \lambda y \exists x[X(x) \land R_C(y,x)]$

Support for this analysis that brings existential-*be*-like predicates and existential-*have*-like predicates close together comes from languages like Hebrew in which existential-*have*-like predicates are formed by adding an oblique argument to existential-*be*-like predicates, as shown in (33).[8]

(33) a. **yesh**   mishehu she-meacben et dafna   kol ha-zman
      there-is someone that-annoys ACC Daphna all   the-time
      'There is someone who bothers Daphna all the time.'

    b. <u>le-dafna</u>   **yesh**   mishehu she-meacben ota   kol ha-zman
       to-daphna there-is someone that-annoys ACC-her all   the-time
       'Daphna has someone who bothers her all the time.'

It is less clear to me what characterizes the predicates of type (ii) in § 3.2.5. Grosu's description and examples are very heterogeneous: predicates of 'coming into being, view, or availability, or causation of one of these (for example, *arrive, be born, choose, look for, find, send, obtain,* and *wangle*)'. Also, there is a lot of cross-linguistic variation about them and there are languages that do not allow existential FRs to occur with predicates of type (ii) at all, Italian being one of them. Further research is needed. For the time being, I will concentrate only on predicates of type (i), which can introduce existential FRs in all languages that have them and whose semantic contribution is more transparent.

If we assume the logical representation for existential-*be*-like predicates and existential-*have*-like predicates in (31) and (32) above, we can easily account for the fact that existential FRs behave like non-specific indefinite DPs, i.e. they cannot take scope above the matrix subject or above negation. This is due to the fact that existential FRs do

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[8] Cf. Benveniste (1971), Freeze (1992), Kayne (1993).

not have their own quantificational force, but they acquire it by combining with the matrix predicate. The existential quantifier is part of the logical representation of the lexical meaning of the matrix predicate. As such, its scope will be anything in the domain of the matrix predicate, but nothing outside that.

I will now show the semantic derivation of a couple of examples of existential FRs. I assume that existential FRs have the same syntactic structure as standard FRs: they are bare CPs. Also, I assume that the wh-words in existential FRs are the same as the wh-words in standard FRs; therefore, their semantic contribution will be the same as in Chapter 2.

Let us start with an existential FR introduced by an existential-*be*-like predicate. The example in (34) from Italian shows an existential FR introduced by *chi* 'who'. Comments follow.

(34) a. C'è [FR chi   sà   dire solo no].   *Italian*
        there's who can.3S say only no
        'There {is somebody/are people} who {says/say} no all the time.'

   b.   IP$_2$

        C'è   CP

           DP   C'
          chi$_1$

                 C   IP$_1$
                 λ$_1$

                      DP   I'
                      t$_1$
                           sà dire solo no

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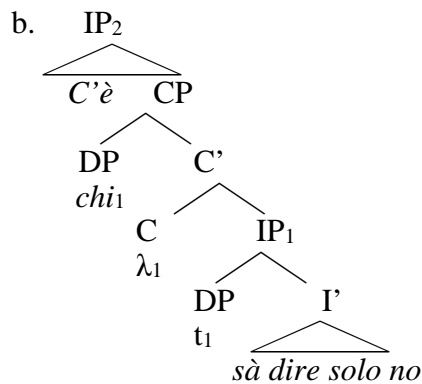
(35) 1. I' → λy[sà-dire-solo-no′(y)]   LEX[9]

    2. t_1 → x_1 LEX

    3. IP_1 → λy[sà-dire-solo-no′(y)](x_1) = sà-dire-solo-no′(x_1)   FA

    4. C' → λx_1[sà-dire-solo-no′(x_1)]   λ-abstr

    5. *chi*$_1$ → λXλx_1[+animate′(x_1) ∧ X(x_1)]   LEX

    6. CP → λXλx_1[+animate′(x_1) ∧ X(x_1)](λx_1[sà-dire-solo-no′(x_1)])   FA

         = λx_1[+animate′(x_1) ∧ sà-dire-solo-no′(x_1)]

    7. *C'è* → λX∃x[X(x)]   LEX

    8. IP_2 → λX∃x[X(x)](λy[+animate′(y) ∧ sà-dire-solo-no′(y)]) =   FA

         = ∃x[+animate′(x) ∧ sà-dire-solo-no′(x)]

Comments. Notice that the logical representation for *chi* 'who' (35.5) is identical to the

one for *who* in standard FRs that was given in Chapter 2. The only crucial difference

between the derivation below and the one in Chapter 2 is the absence of the δ rule, since

there is no type-mismatch between the existential FR and the complement selected by the

matrix predicate.

Let us now look at an example of an existential FR introduced by an

existential-*have*-like predicate. The example in (36) from Italian shows an existential FR

introduced by *con chi* 'with who'. Comments follow.

(36) a. Flavio ha [$_{FR}$ con chi   parlare].   *Italian*
         Flavio has   with who speak.INF
         'Flavio has somebody he can talk to.'

---

b.

```
           IP₂
          /    \
     Flavio₂    I₂'
              /    \
            ha      CP
                  /    \
                PP      C'
               /  \    /   \
              P   DP  C      IP₁
            con  chi₁ λ₁    /    \
                          DP      I₁'
                         PRO₂    /   \
                               M      VP
                                    /     \
                                parlare    PP
                                          /  \
                                         P    DP
                                        con   t₁
```

(37) 1. $t_1 \to x_1$ LEX

2. $con \to \lambda y \lambda x[con'(x,y)]$ LEX

3. $PP \to \lambda y \lambda x[con'(x,y)](x_1) = \lambda x[con'(x,x_1)]$ FA

4. $parlare \to \lambda x[parlare'(x)]$ LEX

5. $PRO_2 \to flavio'$ LEX

6. $\mathbf{M} \to \lambda X \lambda y \mathbf{M}[X(y)]$ LEX

7. $VP \to \lambda x[parlare\text{-}con'(x,x_1)]$ LEX

8. $I_1' \to \lambda X \lambda y \mathbf{M}[X(y)](\lambda x[parlare\text{-}con'(x,x_1)])$ FA
      $= \lambda y \mathbf{M} parlare\text{-}con'(y,x_1)$

9. $IP_1 \to \lambda y \mathbf{M} parlare\text{-}con'(y,x_1)](flavio')$ FA
      $= \mathbf{M} parlare\text{-}con'(flavio',x_1)$

10. $C' \to \lambda x_1 \mathbf{M}[parlare\text{-}con'(flavio',x_1)]$ λ-abstr

11. $[_{DP} chi_1] \to \lambda X \lambda x_1[+animate'(x_1) \wedge X(x_1)]$ LEX

12. $[_{PP} con\ chi_1] \to \lambda X \lambda x_1[+animate'(x_1) \wedge X(x_1)]$??

13. $CP \to \lambda X \lambda x_1[+animate'(x_1) \wedge X(x_1)](\lambda x_1 \mathbf{M}[parlare\text{-}con'(flavio',x_1)])$ FA
      $= \lambda x_1[+animate'(x_1) \wedge \mathbf{M} parlare\text{-}con'(flavio',x_1)]$

14. $ha \to \lambda X \lambda y \exists x[X(x) \wedge R_C(y,x)]$ LEX

15. $I_2' \to \lambda X \lambda y \exists x[X(x) \wedge R_C(y,x)](\lambda x_1[+animate'(x_1) \wedge \mathbf{M} parlare\text{-}con'(flavio',x_1)])$ FA
      $= \lambda y \exists x[+animate'(x_1) \wedge \mathbf{M} parlare\text{-}con'(flavio',x_1) \wedge R_C(y,x)]$

16. $IP_2 \to \lambda y \exists x[+animate'(x) \wedge \mathbf{M} parlare\text{-}con'(flavio',x_1) \wedge R_C(y,x)](flavio')$ FA
      $= \exists x[+animate'(x) \wedge \mathbf{M} parlare\text{-}con'(flavio',x_1) \wedge R_C(flavio',x)]$

Comments. Since it is not crucial for our discussion, I ignored the fact that PRO is a

pronominal element that is obligatorily controlled by the DP *Flavio* in (36) and I just

assigned it the same denotation as *Flavio* lexically.

The existential FR in (36) has a modal flavor that I translated by means of the modal

can. It is a modality of possibility/availability. As pointed out by Pancheva Izvosrski

(2000), (38) is ambiguous between a possibility/availability reading (38a) and a deontic

reading (38b). The existential FR in (36) can only be interpreted as (38a).

(38) Flavio has somebody to talk to.
    a. Flavio has somebody he can talk to. (possibility/availability)
    b. Flavio has somebody he has to talk to. (deontic necessity)

More generally, it is crosslinguistically true that <u>infinitival/subjunctive</u> existential FRs

are always interpreted as expressing some modality of possibility/availability.[10] In (36), I

used the operator **M** (37.6) just to signal the modality of the existential FR, without

dealing with it, because it is not crucial for our discussion. The only reason why **M** is in I

rather than anywhere else is because the modality of existential FRs seems to be triggered

by the nature of the verbal inflection (infinitive/subjunctive *vs.* indicative).

Although the wh-word *chi* obligatorily pied-pipes its sister preposition *con*, I assumed

that *con* reconstructs into its base-generated position at LF. If a copy theory of movement

is assumed, the copy of the preposition that is interpreted is always the base-generated

one. In this way, the variable we are left with is of the right semantic type in order for the

existential FR to end up denoting a set of entities. It follows that the PP in Spec of CP has

exactly the same denotation as its DP complement (37.11-12)

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[10] Notice that, contra Pancheva Izvosrski (2000) and Grosu (to appear), not all existential FRs have to receive a modal interpretation, as shown by the indicative existential FR in (34).

3.2.7.1 Conclusions

I have given an analysis of existential FRs that makes them syntactically and semantically very similar to standard FRs. Syntactically, they are both bare wh-CPs. Semantically, they have the same denotation up to the CP level: they both denote a set of entities. The main difference is due to the matrix clause. In particular, an existential FR always occurs in the complement position of a predicate selecting for a set-denoting expression. As such, no type mismatch arises and the set denoted by the existential FR is quantified over by the existential quantifier introduced as part of the lexical meaning of the matrix predicate. On the other hand, as we saw in Chapter 2, standard FRs always give rise to a type mismatch since they always occur in an argument position of a predicate selecting for an entity-denoting expression in that position. A type-shifting rule applies by default to fix the type mismatch.

3.2.8. Other proposals

3.2.8.1 Grosu and Landman (1998)

Although developed independently, the analysis of existential FRs I proposed in the previous section can also be seen as an implementation of a suggestion briefly sketched in Grosu and Landman (1998), where existential FRs are discussed mainly as an example of a wh-construction that lacks an external HEAD and therefore does not exhibit maximality. Here is their suggestion in their own words (they call existential FRs 'irrealis free relatives'):

We assume that irrealis free relatives are bare CPs and do not occur in DP positions. […]

Landman (1997) assumes that the position that is open to definiteness effect [where irrealis free relatives mainly occur, I.C.] is a position whose interpretation is set denoting – meaning, an NP or a CP, but crucially not a DP […]. Whereas indefinites in argument position are DPs with an empty determiner that trigger Existential Lift, in contexts of indefiniteness Existential Lift is not triggered as part of the NP meaning (which is just a set), but comes in as part of the construction. Landman (1997) contains an explicit proposal to this effect. If we follow this, we predict correctly that irrealis free relatives can occur in contexts of indefiniteness, and we predict correctly that irrealis free relatives always have an existential interpretation (which comes in not as part of their meaning, but as part of the construction they occur in). [Grosu and Landman, 1998: 158]

3.2.8.2 Izvorski (1998)

Izvorski (1998) claims that existential FRs are not FRs. She assumes that there are two different sets of wh-words, the ones that introduce FRs and the ones that introduce wh-INTs. The former encode maximality in their lexical meaning. Therefore, a wh-clause has to exhibit maximality to be a FR. Otherwise, it is a wh-INT. Since existential FRs do not exhibit maximality, then they are not FRs. Wh-INTs, including existential FRs, translate into an open formula with a free variable (or more than one). Although she does not give an explicit semantics, she suggests, following Milsark (1974), that the existential predicates that introduce existential FRs provide an existential quantifier that closes the open formula in the case of existential FRs.

3.2.9. Conclusions: Existential free relatives and wh-words

In this first part of the chapter, we saw that most languages with DP-like standard FRs also have existential FRs. Existential FRs are introduced by the same wh-words as DP-like standard FRs, but, unlike DP-like standard FRs, they can occur only in the complement position of a very restricted class of predicates and cannot be paraphrased with definite DPs, i.e. they never refer to a maximal entity.

Existential FRs support and strengthen the conclusions about the semantic contribution

of wh-words we reached looking at DP-like standard FRs in Chapter 2. Contra Jacobson (1995), wh-words do not lexically encode maximality, otherwise they could not occur in non-maximal constructions like existential FRs.

3.3. PP-like standard free relatives

3.3.1. Recalling the definition

According to the definition in Chapter 2, PP-like standard FRs are all the standard FRs that are not DP-like standard FRs, i.e. all the standard FRs that can be replaced and paraphrased with a DP or a PP in an adjunct position or with a PP in a complement position (i.e. an argument position that is different from the subject position). Only standard FRs introduced by *where*, *when*, and *how* can occur as PP-like standard FRs. Examples are repeated in (10).

(39) a. I went [FR where you told me to], but I couldn't find anything.
    a'. I went [PP to the place where you told me to], but I couldn't find anything.
    b. [FR When you say goodbye], I die a little.
    b'. [PP Every time you say goodbye], I die a little.
    b". [PP On the occasions you say goodbye], I die a little.
    c. I studied for the final [FR how you studied for it], but you did better.
    c'. I studied for the final [PP in the same way you studied for it], but you did better.

3.3.2. PP-like standard FRs do not denote entities

The semantic literature on FRs has basically ignored PP-like standard FRs. Even when they are mentioned as examples of FRs, no analysis of their semantic properties is given. In this section, I will first show that they do not denote entities, unlike DP-like standard FRs.

Let us start with a couple of assumptions. 1) The only semantic role that entities can play is, in Fregean terms, to saturate predicates, i.e. they can only be arguments of functions. Therefore, we expect to find entity-denoting expressions only in argument position.[11] 2) All entities can be referred to by means of definite DPs. We saw that Link's (1983) theory of definite DPs that we are assuming guarantees that definite DPs always refer to entities. But can they refer to all possible entities? They certainly do, if the entities in our ontology are the ones we have dealt with so far (animate things, inanimate things, places, times/situations, manners/ways) plus propositions. This can be proved with an easy trick: *the animate things, the inanimate things, the places, the times/situations, the manners/ways, the proposition that…* (or *the claim that…*, *the fact that…*, etc.) are all definite DPs and refer to all the possible entities we have in our ontology.

Given the two assumptions above, we can conclude that PP-like standard FRs do not denote entities because 1) they do not occur in argument position and/or 2) they cannot be paraphrased with definite DPs. For instance, the PP-like standard FRs in (10b,c,d) are all in adjunct position, and this is true in most cases, given our definition of PP-like standard FRs. The only exception is with PP-like standard FRs introduced by *where* that occur as complements of motion verbs, as in (10a). But even in this case we are not dealing with an entity-denoting PP-like standard FR since [FR *where you told me to go*]

_____

[11] This is meant as just a necessary condition for an expression to be entity-denoting.

cannot be replaced by a definite DP *I went [DP the place you told me to go],[12] i.e. it cannot be replaced with something that clearly refers to an entity.

3.3.3. PP-like standard FRs that do not exhibit maximality

We just concluded that, unlike DP-like standard FRs, PP-like standard FRs do not denote entities. What do they denote then? In order to answer this question, a detailed semantics for PP complements and adjuncts in general is needed, but I am not aware of any (but cf. at least Kracht 2002 for a preliminary investigation of locative PPs). Despite this limitation, it is still possible to make an important point about the semantic properties of PP-like standard FRs.

As shown in Chapter 2, DP-like standard FRs always exhibit maximality, i.e. they always refer to a maximal entity. Crucially, this is not true for PP-like standard FRs. Since in the previous section we concluded that PP-like standard FRs do not denote entities at all, it may look rather trivial to claim that they do not denote maximal entities. But what I mean when I say that PP-like standard FRs need not exhibit maximality is that they can be paraphrased with PPs whose DP complement is not maximal, i.e. it is not a definite DP or any other DP that can denote a maximal entity. As argued above, the DP *the place*(s) and the PP *to the place*(s) clearly do not denote the same semantic object. Nevertheless, there is a clear intuition that the semantic properties of *to the place*(s) are

---

[12] Although *I went the places you told me to go* is judged as acceptable as *I went to the places you told me to go* (some speakers even prefer the option with no preposition), this is a specific property of the plural form *places* and does not apply in general, as shown by the unacceptability of (i) and (ii):

(i) * I went the fire houses you told me to go.

(ii) * I went the restaurants you told me to go.

related to the fact that it has a definite DP as its complement and that *to the place*(*s*) is semantically different from *to a place/places*. In other words, *I went to <u>the</u> place*(*s*) *you told me to* and *I went to <u>a</u> place you told me to* are not truth conditionally equivalent, therefore it follows from the principle of compositionality that *to the place*(*s*) and *to a place/places* are not semantically equivalent either.

From (40) to (44) examples are given of PP-like standard FRs that do not exhibit maximality, i.e. PP-like standard FRs that can be replace and paraphrased with PPs that have an indefinite DP as their complement, but not with PPs that have a definite DP complement. The examples are grouped and numbered according to the kind of PP that is used to paraphrase them (motion, location, time, manner). For each group/number, very similar examples are given from English and Italian together with their closest non-maximal/maximal PP paraphrases. The examples are such that the maximal PPs not only are not truth-conditionally equivalent to the corresponding PP-like standard FRs, but they also make the sentences they occur in degraded.

(40) *PP-like standard FRs introduced by* where *in PP argument position (location)*
    a. For years, I lived …
        …   [$_{FR}$ where it never snowed].
        … # [$_{definite\ DP}$ in the place(s) where it never snowed].
        …   [$_{indefinite\ DP}$ in a place/places where it never snowed].

    b. Ho vissuto per anni ...
        ...   [$_{FR}$ dove non nevicava mai].
        ... # [$_{definite\ DP}$ nel posto/nei posti dove non nevicava mai].
        ...   [$_{indefinite\ DP}$ in un posto/in posti dove non nevicava mai].

(41) *PP-like standard FRs introduced by* where *in PP argument position (movement)*

    a. Captain Kirk went …

        …   [FR where no man had gone before].

        … #[definite DP to the place(s) where no man had gone before].

        …   [indefinite DP to a place/places where no man had gone before].

    b. Il capitano Kirk e il suo equipaggio sono arrivati ...

        ...   [FR dove nessuno era mai arrivato prima].

        ... #[definite DP nel posto/nei posti dove nessuno era mai arrivato prima].

        ...   [indefinite in un posto/in posti dove nessuno era mai arrivato prima].

(42) *PP-like standard FRs introduced by* where *in adjunct position*

    a. Next year, I want to spend my vacation …

        …   [FR where there are no tourists].

        … #[definite DP in the place(s) where there are no tourists].

        …   [indefinite DP in a place/places where there are no tourists].

    b. L'anno prossimo voglio trascorrere le vacanza ...

        ...   [FR dove non ci sono turisti].

        ... #[definite DP nel posto/nei posti dove non ci sono turisti].

        ...   [indefinite in un posto/in posti dove non ci sono turisti].

(43) *PP-like standard FRs introduced by* when

    a. You said Gennaro has class and office hours every week on Tuesday and Thursday. Do
       you think I could introduce myself …
       …   [FR when he is in for his office hours], …
       … #[definite DP at the time when he is in for his office hours], …
       …   [indefinite DP sometime/at a time when he is in for his office hours], …
                               … if he is not talking to any students?

   a'. Hai detto che Gennaro insegna e riceve gli studenti ogni settimana di martedì e giovedì.
       Credi che sia inopportuno presentarmi a lui ...
       ...   [FR quando è in università per il ricevimento], ...
       ... #[definite DP la volta che è in università per il ricevimento], ...
       ...   [indefinite DP qualche volta che è in università per il ricevimento], ...
                              ... se non è impegnato con gli studenti?

    b. If you don't want to waste too much time, you should go to the post office to mail that
       letter …
       …   [FR when it is not too crowded], …
       … #[definite DP at the time when it is not too crowded], …
       …   [indefinite DP at a time when it is not too crowded], …
                    … that is early in the morning or in the middle of the afternoon.

   b'. Se non vuoi perdere tropppo tempo, dovresti andare in posta a spedire quella lettera ...
        ...   [FR quando non c'è troppa gente], ...
       ... #[definite DP nel momento in cui non c'è troppa gente], ...
       ...   [indefinite DP in un momento in cui non c'è troppa gente], ...
                   ... cioè al mattino presto o nel primo pomeriggio.

(44) *PP-like standard FRs introduced by* how

    a. Barbara Cook managed to sing that old song …

        … [FR how I've never heard it sung before].

        … #[definite DP in the way(s) I've never heard it sung before].

        … [indefinite DP in a way I've never heard it sung before].

    a'. Oggi il mio cavallo ha corso

        ... [FR come non avevo mai corso prima].

        ... #[definite DP nel modo in cui non avevo mai corso prima].

        ... [indefinite DP in un modo in cui non avevo mai corso prima].

    b. I hate those times when word processors behave

        … [FR how you'd never expect them to].

        … #[definite DP in the way(s) you'd never expect them to].

        … [indefinite DP in a way/ways you'd never expect them to].

    b'. Il mio computer ha iniziato a comportarsi

        ... [FR come non si era mai comportato prima].

        ... #[definite DP nel modo/nei modi in cui non si era mai comportato prima].

        ... [indefinite DP in un modo/in modi in cui non si era mai comportato prima].

3.4. Conclusions: Non-maximal free relatives and wh-words

In this chapter, I discussed existential FRs and PP-like standard FRs, which have been largely ignored in the literature. The reason why they are both particularly relevant for the purposes of the present work is because they are both introduced by the same wh-words as DP-like standard FRs, but neither of them refers to a maximal entity.

    I argued that existential FRs always denote a set of entities that is quantified over by the existential quantifier in the lexical meaning of the matrix predicate. This would account for the distributional restrictions on existential FRs and their scopal properties. As for PP-like standard FRs, I argued that they never refer to maximal entities since they never refer to entities at all. I showed that PP-like standard FRs can always replaced and

paraphrased with PPs, therefore they must denote what PPs denote. Although I did not provide a compositional semantics for PPs or PP-like standard FRs, crucially I showed that PP-like standard FRs need not exhibit maximality, even if an extended notion of maximality for PPs is adopted, according to which a PP exhibits maximality if its DP complement denotes a maximal entity. Many examples were given of PP-like standard FRs that could be replaced and paraphrased with PPs with an indefinite (=non-maximal) DP as their complement, but not with PPs with a definite (=maximal) DP.

The conclusions of our discussion of existential FRs and PP-like standard FRs both support and strengthen the conclusions about the semantic contribution of wh-words that we reached in Chapter 2. Wh-words do not lexically encode maximality, contra Jacobson (1995). Otherwise wh-words could not occur in non-maximal constructions like existential FRs and PP-like standard FRs. On the other hand, as we have already discussed in Chapter 2, wh-words cannot lexically encode any existential force, otherwise we would not be able to account for maximality when it shows up in standard FRs. By looking at both DP-like standard FRs on the one hand and existential FRs and PP-like standard FRs on the other, we can conclude that the lexical meaning of wh-words must be free of any maximality or quantificational force.

CHAPTER 4

–*ever* Free Relatives: Maximal or Non-maximal?

4.1. *-ever* free relatives: a definition

I will call **-*ever* free relatives** (henceforth, **-*ever* FRs**) FRs introduced by wh-words with

the *-ever* suffix or its equivalent across languages (henceforth, **-*ever* words**). Examples

from English are given (1).

(1) a. I'll marry [*-ever* FR **whoever** you choose].
     b. I tasted [*-ever* FR **whatever** Adam cooked].
     c. You can smoke [*-ever* FR **wherever** the kids aren't playing].
     d. I left [*-ever* FR **whenever** Flavio arrived].
     e. I did it [*-ever* FR **however** you did it].[1]

  -ever FRs are FRs according to the definition in Chapter 1: 1) they contain a

morphologically complex word with a wh-word as its root; 2) they are clauses with a gap

in argument or adjunct position (e.g. the object of *choose* in (1a), or a locative adjunct in

(1c)); and, 3) they can always be replaced with truth-conditionally equivalent DPs or

PPs, as shown in (2) below.

---

[1] According to my consultants, (1e) must be uttered with contrastive stress on *I* and *you* to sound perfectly
acceptable.

(2) a. I'll marry [_-ever FR_ whoever you choose].
    a'. I'll marry [_DP_ any person you choose].
    b. I tasted [_-ever FR_ whatever Adam cooked].
    b'. I tasted [_DP_ the food/things Adam cooked].
    c. You can smoke [_-ever FR_ wherever the kids aren't playing].
    c'. You can smoke [_PP_ in any place where the kids aren't playing].
    d. I left [_-ever FR_ whenever Flavio arrived].
    d'. I left [_PP_ at the time that Flavio arrived].
    e. I did it [_-ever FR_ however you did it].
    e'. I did it [_PP_ in the way you did it].

Notice that although the pairs above are roughly truth-conditionally equivalent, they cannot be used in exactly the same contexts. For instance, (2b') can be immediately followed by naming the things that Adam cooked (*I tasted the food Adam cooked, <u>i.e. the stuffed mushrooms and the strawberry cheesecake</u>.*), while (2b) cannot (*I tasted whatever Adam cooked, <u>i.e. the stuffed mushrooms and the strawberry cheesecake</u>.*). This is because in this case *whatever* seems to signal that the speaker somehow does not know or remember the precise identity and/or the name of what Adam cooked. I will return to these non-truth conditional differences later on.

The bracketed strings in (3) look identical or very similar to the *-ever* FRs in (1).

(3) a. [Whoever you choose], you won't make a bad choice.
    b. [Whatever Adam cooked], I am sure that your food is still better.
    c. [Wherever the kids were playing], I think it was your responsibility to follow them and look after them carefully.
    d. [Whenever his partner gets back in the evening], he always starts eating dinner at 7 PM.
    e. [However you did it], I won't change my mind about it.

Nevertheless, the bracketed strings in (3) are not *-ever* FRs, since they are not FRs at all. In fact, there is no DP or PP that can replace and paraphrase them. The bracketed strings in (3) are interpreted like concessive clauses and can be paraphrased with *no*

matter clauses, as in (4).

(4) a. [No matter who you choose], you won't make a bad choice.
   b. [No matter what Adam cooked], I am sure that your food is still better.
   c. [No matter where the kids were playing], I think it was your responsibility to follow them and look after them carefully.
   d. [No matter when his partner gets back in the evening], he always starts eating dinner at 7 PM.
   e. [No matter how you did it], I won't change my mind about it.

Although there is the feeling that *-ever* FRs and strings like the ones in (3) are somehow related, their semantic behavior is clearly different and I do not have much to say about it. A preliminary partial semantic analysis of this construction can be found in Izvorski (2000), who calls this construction "free adjunct free relatives". She starts from the semantic analyses that have been suggested for *-ever* FRs that I will discuss later and argues that a concessive interpretation can be derived from that. Unfortunately, she does not show how this result can be obtained compositionally. So it is not clear if this construction tells us anything more about the semantic contribution of wh-words. For the time being, I assume that it does not. Therefore, I keep the definition of FRs given in Chapter 1 and conclude from that that the construction in (3) is not a FR.

4.2. Some cross-linguistic generalizations about *-ever* free relatives

The examples of *-ever* FRs in (1) are almost identical to the examples of English standard FRs in Chapter 2, which I have repeated below in (5).

(5) a. I'll marry [Standard FR who you choose].
   b. I tasted [Standard FR what Adam cooked].
   c. You can't smoke [Standard FR where the kids are playing].
   d. I left [Standard FR when Flavio arrived].
   e. I did it [Standard FR how you did it].

This is just to show that all wh-words that can occur in standard FRs have an -*ever* form that can occur in -*ever* FRs as well, at least in English. There are languages in which not all the wh-words that can introduce standard FRs have a corresponding -*ever* form. For instance, Italian can form standard FRs introduced by *chi* 'who', *dove* 'where', *quando* 'when', and *come* 'how' (cf. Chapter 2, § ??), but only *chi* and *dove* have an -*ever* variant, -*unque* being the equivalent of -*ever*: *chiunque* 'whoever' and *dovunque* 'wherever'. *Quandunque* is not even a word in Italian, while *comunque* only means 'in any case'.

The next two generalizations about -*ever* FRs hold crosslinguistically, by contrast.

4.2.1. Generalization 1: no *whyever* free relatives

In the same way that *why* cannot occur in standard FRs (6b), there is no -*ever* FR (6a) introduced by *whyever*.

(6) a.*I am sure he did it [-*ever* FR **whyever** she did it].
     b.*I am sure he did it [Standard FR **why** she did it].

Italian exhibits a similar pattern. *Perché* 'why' cannot occur in standard FRs and similarly the -*ever* form (*perchiunque* or *percunque*) is not even in the lexicon.

(7) a.* L'ho fatto [**perchiunque** l'hai   fatto tu].
          it-have.1S   whyever   it-have.2S done you
          ('I did it for whatever reason you did it.')
     a'.* L'ho fatto [**perché** l'hai   fatto tu].[2]
          it-have.1S   why it-have.2S done you
          ('I did it for the same reason you did it.')

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[2] The sentence is acceptable with the meaning of 'I did it because you did it', but in this case it is no longer a standard FR, as I already discussed in Chapter 1 § ????.

4.2.2. Generalization 2: [*whatever/whichever* + NP] *vs.* *[*what/which* + NP]

There are wh-words that cannot occur in standard FRs, but have an *-ever* form that occurs

in *-ever* FRs. The examples in (8) show a clear pattern: *-ever* FRs can be introduced by

complex wh-phrases, while standard FRs cannot. In particular, complex wh-phrases in

-ever FRs consist of an *-ever* wh-word that occurs in a determiner-like or modifier-like

position followed by a NP (8a,d), or an adverb (8b), or an adjective (8c).

(8)　a.　　I will read [*-ever* FR [DP **whatever/whichever** (good) book] you just read].
　　　a'.*　I will read [Standard FR [DP **what/which** (good) book] you just read].
　　　b.　　I can drive [*-ever* FR [AdvP **however** slowly] you want me to].
　　　b'. * I can drive [Standard FR [AdvP **how** slowly] you want me to].
　　　c.　　I am sure he will grow [*-ever* FR [AdjP **however** tall] his father was].
　　　c'. * I am sure he will grow [Standard FR [AdjP **how** tall] his father was].
　　　d.　? I am sure that my dad will pay for [*-ever* FR [DP **whosever/whoever's** car] I damage].
　　　d'. * I am sure that my dad will pay for [Standard FR [DP **whose** car] I damage].

　Languages can vary in the complex wh-phrases that can occur in *-ever* FRs in a way

that depends on the *-ever* forms that are available in the lexicon. Language specific

idiosyncrasies determine the set of determiner-like or modifier-like *-ever* forms. For

instance, in Italian only *quale* 'which' + NP has a corresponding morphologically

complex form that can occur in *-ever* FRs: *qualunque* 'whichever'. As discussed above,

com-unque (lit. 'how-ever') is used only with the meaning of 'in any case', while the

morphologically complex form of *che* 'what' is not even in the lexicon. This may be due

to some blocking effect, since the potential form *cunque/chiunque* 'whatever' would

sound (almost) identical to *chiunque* 'whoever'.

4.2.3. Conclusions: *-ever* free relatives are free relatives

To sum up, it is crosslinguistically attested that 1) the wh-words that introduce

standard FRs, or a subset of those, have a corresponding *-ever* form that can introduce *-ever* FRs; 2) in the same way that standard FRs cannot be introduced by *why* or its equivalents across languages, *-ever* FRs cannot be introduced by the *-ever* form of *why*, which is often not even in the lexicon;[3] 3) *-ever* FRs can be introduced by complex wh-phrases in which the *-ever* wh-word occurs in a determiner-like or modifier-like position.

I take the similarities in 1) and 2) above to be enough to conclude that *-ever* FRs and standard FRs form a natural class and it makes sense to have a definition that groups them together, like the one in Chapter 1. If this assumption is correct, by looking at the semantic behavior of *-ever* FRs and their wh-words, we can draw conclusions about the semantic contribution of FRs and wh-words in general. It would desirable if these conclusions were also able to account for the difference in 3), i.e. why *-ever* FRs can be introduced by complex wh-phrases, while standard FRs cannot. This is what I will try to do in the remainder of this chapter.

4.3. The semantic behavior of *-ever* free relatives

4.3.1. Two readings for *-ever* free relatives?

Two readings have been recognized for *-ever* FRs in the literature. Following Dayal (1997), I call them the **identity reading** and the **free choice reading**. Each example in (9) illustrates a different reading (both examples from Dayal (1997: ex. 10a,b)).

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[3] *Whyever* is marginally attested in English in wh-INTs.

(9) a. [_FR_ Whichever movie is now playing at the Avon] is making a lot of money.
   b. [_FR_ Whichever movie plays at the Avon] makes a lot of money.

The *-ever* FRs in (9) could be roughly paraphrased as follows:

(10) a. [_DP_ The movie that is now playing at the Avon, but I don't remember which,] is making a lot of money.
   b. [_DP_ Any movie that plays at the Avon] makes a lot of money.

(9a) illustrates the identity reading. The *-ever* FR in (9a) refers to a specific movie, whose <u>identity is unknown</u>, as made clear by its paraphrase in (10a). On the other hand, (9b) illustrates the free choice reading. The *-ever* FR in (9b) refers to <u>any</u> movie that plays at the Avon, as made clear by its paraphrase in (10b).

Do the two readings above imply that *-ever* FRs are intrinsically ambiguous?

4.3.2. *-ever* free relatives as quantified expressions

Tredinnick (1994) argues that *-ever* FRs are ambiguous. When *-ever* behaves like a universal quantifier, then *-ever* FRs are interpreted as universally quantified expressions (our free choice reading), otherwise *-ever* FRs are interpreted like specific indefinites (our identity reading).

Dayal (1997) points out that the latter is not tenable, since *-ever* FRs have different familiarity requirements from specific indefinites, as shown by the contrast in (11) (adapted from Dayal's example (14)).

(11) a. Mary bought something$_1$. [Whatever she bought]$_1$ was expensive.
   b. Mary bought something$_1$. [Something she bought]$_{*1}$ was expensive.

Other arguments have been suggested in favor of an analysis of *-ever* FRs as universals:

(12) Polarity item licensing (Tredinnick 1993)
   a. He got in trouble for what*(ever) he ever did to anyone.
   b. I will go where*(ever) the hell you go.

(13) QVE (Tredinnick 1993)
   a. When I go to the store, I mostly buy potatoes.
   b. Whenever I go to the store, I mostly buy potatoes.

(14) Type difference and pseudo-clefts (Iatridou and Varlokosta 1998)
   a. What(ever) Mary bought was expensive.   *predicational*
   b. What(*ever) Mary bought was Barriers.   *specificational*

(15) Missing prepositions (Larson 1987)
   I will live in what*(ever) towns you live.

(16) Negation (Dayal 1997)
   I didn't like *what/whatever Sue ordered, but I liked most of it.

4.3.3. *-ever* free relatives as modalized definites (Dayal 1997)

Contra Larson (1987), Tredinnick (1994) and Iatridou and Varlokosta (1998), Dayal (1997) points out that the two readings are not instances of ambiguity, but they result from the interplay of the unambiguous semantic contribution of wh-words, tense, and aspect.

   Her basic proposal is that an *-ever* FR is a standard FR with an extra modal dimension and is interpreted with respect to a set of alternatives to the world of evaluation, which she calls 'i(dentity)-alternatives'. For instance, *Jie ate what Adam cooked* means that Jie ate the thing(s) Adam cooked in the actual world, while *Jie ate whatever Adam cooked* means that in <u>every</u> world that is an i-alternative, Jie ate the thing(s) Adam cooked in that i-alternative. An i-alternative is a world that is identical to the actual world except for what the standard FR denotes. Let us assume that Adam cooked Tuscan soup. Then, an

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i-alternative is a world that is identical to the actual world except that Adam did not cook

Tuscan soup in that world, but something else.

Dayal adopts a translation language that allows explicit quantification over worlds

(Gallin 1975) and formalizes her proposal as follows:[4]

(17) a. whatever$_i$ [$_{IP}$ … t_i…] denotes at w =
         $\lambda Q \ \forall i\text{-alternative} \in f(w)(s) \ [Q(i)(\iota x[P(i)(x)])]$
         where P is the property derived by abstracting over x_i in the IP denotation.
     b. $f(w)(s) = \{w': \forall p[s \text{ believes } p(w) \rightarrow p(w')]\}$
         for a world of evaluation *w* and a speaker *s*, f(w)(s) is the set of worlds in which the
         speaker's beliefs about *w* hold.
     c. a world $w' \in f(w)(s)$ is an i-alternative iff there exists some $w'' \in f(w)(s)$, such that
         $\iota x[P(w')(x)] \neq \iota x[P(w'')(x)]$

A standard FR like *what Adam cooked* denotes a maximal individual in the actual

world *w*, i.e. the thing(s) that Adam cooked in *w* ($\iota x[P(w)(x)]$ in (17)). On the other hand,

we can imagine worlds *w'*, *w''*, etc. that are exactly identical to the actual world *w* except

for the thing(s) that Adam cooked; in other words, *w'*, *w''*, etc. differ only in the

denotation of the standard FR *what Adam cooked* ($\iota x[P(w)(x)]$) $\neq$ ($\iota x[P(w')(x)]$) $\neq$

($\iota x[P(w'')(x)]$ etc., in (17c)). The worlds *w'*, *w''*, etc. are all i-alternatives with respect to

that standard FR *what Adam cooked* and its denotation. The corresponding *-ever* FR

whatever Adam cooked introduces a modal dimension since its denotation depends on

those i-alternatives. According to (17), *whatever Adam cooked* denotes the set of the

properties Q that the thing(s) that Adam cooked in <u>all i-alternatives</u> have. Crucially, what

an *-ever* FR like *whatever Adam cooked* denotes in each i-alternative is exactly what the

---

[4] (17a-c) correspond to Dayal's (1997: 26a-c).

corresponding standard FR *what Adam cooked* would denote in the very same i-alternative.

Let us now look at the two sets of examples Dayal discusses to illustrate how her proposal can account for the two readings of *-ever* FRs. She starts by discussing the identity reading. I have slightly adapted (18), (19) and the following discussion from Dayal (1997: 27, 28, and p. 108)

(18) a. Adam is cooking something. [$_{-ever\,FR}$Whatever Adam is cooking] uses onions.
    b. $\forall$i-alternative $\in$f(w)(s) [uses-onions(i)(ιx[cooking(i)(x)(a)])]
    c. $⟦\iota$x[cooking(i-alt$_1$)(x)(a)]$⟧$ = ratatouille
       $⟦\iota$x[cooking(i-alt$_2$)(x)(a)]$⟧$ = lentils
       $⟦\iota$x[cooking(i-alt$_2$)(x)(a)]$⟧$ = goulash

(19) a. [$_{standard\,FR}$What Adam is cooking] uses onions.
    b. [uses-onions(w)(ιx[cooking(w)(x)(a)])]

(18a) with an *-ever* FR says that as far as the speaker is concerned, in all the relevant i-alternatives at *w*, the dish being cooked by Adam uses onions. Or more colloquially, the speaker intends the assertion to hold regardless of the identity of the dish. The assertoric force is therefore attributive. (19a) with a standard FR also lends itself to such an interpretation. But in addition it allows for an interpretation in which the relation between the actual thing that Adam is cooking and the property of using onions is accidental. That is, the assertion can be based on the speaker's belief about a particular entity. The description is simply an expedient way of referring to it. Dayal gives the contrast in (20) (her examples (29)).

(20) a.* Whatever Adam is cooking, namely ratatouille, uses onions.
    b. What Adam is cooking, namely ratatouille, uses onions.

As Dayal puts it, "we can […] think of the contribution of *-ever* as forcing some amount of attributiveness in the semantics" (p. 109).

As for the free choice reading of *-ever* FRs, Dayal claims that its difference from the identity reading can be derived in the same way as the difference between generic and non-generic interpretation, i.e. it depends on whether the world variable is free, hence contextually anchored, or bound by a generic/temporal operator. One reading rather than the other is usually triggered/favored by tense and aspect. For instance, the logical representation of (21a) given in (21b) is very similar to the logical representation of (18a) given in (18b), the only major difference being the contextual variable C playing the usual role of restricting quantification over relevant occasions of Adam's cooking.

(21) a. [$_{-ever\,FR}$Whatever Adam cooks] uses onions.
    b. $\forall w[C(w)][\forall i\text{-alternative} \in f(w)(s)$ [uses-onions(i)(ιx[cooking(i)(x)(a)])]]

Dayal's account establishes a very strict relation between standard FRs and *-ever* FRs: the latter are always derived from the former plus the modality trigger *-ever*. In other words, the denotation of *-ever* FRs is relativized to i-alternatives, but in each i-alternative they behave like definite DPs, and not like universals. Dayal supports this conclusion with the following piece of evidence, based on scopal properties:[5]

(22) a. Mary has read two thirds of every book in the series.
    b. Mary has read two thirds of whatever books are in the series.
    c. Mary has read two thirds of the books in the series.

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[5] (22) and (23) are Dayal's (18) and (19), respectively.

(23) a. Mary ate only a portion of every dish she was served.
  b. Mary ate only a portion of whatever dishes she was served.
  c. Mary ate only a portion of the dishes she was served.

Neither (22a) nor (23a) are ambiguous. The universally quantified DP *every* NP can only scope above *two thirds* or *a portion of*. For every book in the series, Mary has read two thirds of it and, similarly, for every dish she was served, she ate only a portion of it (*distributive reading*).

On the other hand, both (22b) and (23b) are ambiguous. The *-ever* FRs can scope either above or below *two thirds* or *a portion of*. (22b) and (23b) can mean what (22a) or (23a) mean (*distributive reading*), but they can also mean that Mary has read two thirds of the total number of books in the series or that Mary has eaten only part of the total number of dishes she was served (*collective partitive reading*). Dayal points out that the very same ambiguity is found with the definite DPs in (22c) and (23c).

4.3.4. Adapting Dayal's proposal to our semantics for wh-words

Dayal (1997) is the most refined and detailed attempt to deal with the complex semantic issues related to *-ever* FRs. On the other hand, her assumptions about the semantic contributions of wh-words contrast with what we concluded from the previous chapters. For Dayal, wh-words lexically trigger maximality (as in Jacobson (1995)), but what standard and existential FRs have shown us so far is that wh-words are better analyzed as set restrictors. Dayal's proposal can be easily adapted to our semantics for wh-words. What is crucial for her is that maximality shows up as the final semantic contribution of a plain FR before the semantic contribution of the *-ever* morpheme applies (17). There is

no need in her account for maximality to be lexically triggered by wh-words. Therefore, at least two options are available. Either maximality is lexically triggered by the *-ever* morpheme, i.e. it applies to a set-denoting expression P and returns a set of sets Q that is crucially built on the maximal entity of P (24), or the *-ever* morpheme in *-ever* FRs behaves like the matrix predicate in standard DP-like FRs, i.e. it selects for an entity-denoting expression and δ applies as a default strategy to repair the type-mismatch (25).

(24) *-ever* → λPλQ ∀i-alternative ∈f(w)(s) [Q(i)(σx[P(i)(x)])][6]

(25) *-ever* → λ*x*λQ ∀i-alternative ∈f(w)(s) [Q(i)(*x*(i))]

In the remainder of this section I will give and discuss two derivations for the example of an *-ever* FR in (21), repeated as (26) below, that I hope will help to make it clearer how our conclusions about wh-words can be adapted to Dayal's proposal.

(26) [*-ever* FRWhatever Adam cooks] uses onions.

Although Dayal does not give all the details of her semantic analysis, in particular she does not show us what LF she is assuming, her semantics in (17) seems to require *-ever* FRs to undergo some sort of LF movement for then taking the matrix clause denotation as their argument.

This approach sounds plausible, given the alternation whereby *-ever* FRs can be overtly dislocated and have a resumptive pronoun occur in the argument position with no change in their truth conditions, as shown in (27)-(28).

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[6] Although Dayal (1997) makes use of the operator ι to refer to maximalization, I will continue using the operator σ I introduced in Chapter 2 to refer to the same semantic operation.

(27) a. [Whatever Adam cooks] uses onions.
     b. [Whatever Adam cooks], it uses onions.

(28) a. Jie eats [whatever Adam cooks].
     b. [Whatever Adam cooks], Jie eats it.

In what follows, I will assume that *-ever* FRs are always left-dislocated at LF and leave a trace in the original position. In other words, (27a) and (27b) will have the same LF in (29).

(29)   [$_{-ever\,FR}$ Whatever Adam cooks]$_m$ t_m uses onions.

Strictly speaking, the LF movement I am assuming is unnecessary for *-ever* FRs in the subject position. I will assume it anyway for the sake of simplicity.

Let us start with the option in which the *-ever* morpheme takes a set-denoting expression. The LF representation of (26) is given in (30). The relevant steps of the semantic derivation are given in (31). The others are identical to the steps shown and discussed in Chapter 2.

(30)
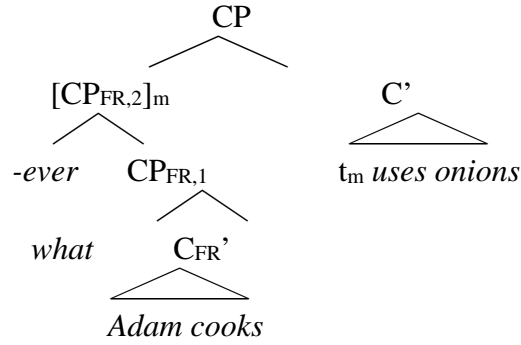
(31) *FR*

1. C_{FR}' → $\lambda x[\text{cook}'(i)(x)(a)]$

2. *what* → $\lambda X \lambda x[\text{inanimate}'(i)(x) \wedge X(i)(x)]$

3. $CP_{FR,1}$ → $\lambda X \lambda x[\text{inanimate}'(i)(x) \wedge X(i)(x)]$ $(\lambda x[\text{cook}'(i)(x)(a)])$
   $= \lambda x[\text{inanimate}'(i)(x) \wedge \text{cook}'(i)(x)(a)]$

4. *-ever* → $\lambda P \lambda Q \ \forall i\text{-alternative} \in f(w)(s) \ [Q(i)(\sigma x[P(i)(x)])]$

5. $[CP_{FR,2}]_m$ →
   $\lambda P \lambda Q \ \forall i\text{-alternative} \in f(w)(s) \ [Q(i)(\sigma x[P(i)(x)])](^\wedge\lambda x[\text{inanimate}'(i)(x) \wedge$
   $\text{cook}'(i)(x)(a)])$
   $= \lambda Q \ \forall i\text{-alternative} \in f(w)(s) \ [Q(i)(\sigma x \ [\text{inanimate}'(i)(x) \wedge \text{cook}'(i)(x)(a)])]$

   Matrix clause

6. C' → $\lambda y \ [\text{use-onions}(i)(y)]$

   FR + matrix clause

7. CP → $\lambda Q \ \forall i\text{-alternative} \in f(w)(s) \ [Q(i)(^\wedge\sigma x \ [\text{inanimate}'(i)(x) \wedge \text{cook}'(i)(x)(a)])]$
   $(\lambda y \ [\text{use-onions}(i)(y)])$
   $= \forall i\text{-alternative} \in f(w)(s) \ [\text{use-onions}'(i)(\sigma x \ [\text{inanimate}'(i)(x) \wedge \text{cook}'(i)(x)(a)])$

Let us now look at the other option in which the *-ever* morpheme takes an entity-denoting expression. The LF representation of (26) is given in (32). The relevant steps of the semantic derivation are given in (33).

(32)

```
                          CP
                 ╱                ╲
          [CP_FR,3]_m              C'
          ╱        ╲              ╱  ╲
      -ever      CP_FR,2      t_m uses onions
                ╱      ╲
              δ       CP_FR,1
                      ╱      ╲
                  what       C_FR'
                            ╱    ╲
                        Adam cooks
```
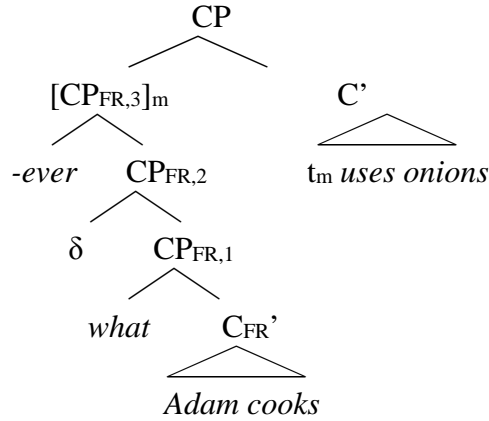
(33) *FR*

1. $C_{FR}' \to \lambda x[cook'(i)(x)(a)]$

2. *what* $\to \lambda X\,\lambda x[inanimate'(i)(x) \wedge X(i)(x)]$

3. $CP_{FR,1} \to \lambda X\,\lambda x[inanimate'(i)(x) \wedge X(i)(x)]\,(\lambda x[cook'(i)(x)(a)])$
   $= \lambda x[inanimate'(i)(x) \wedge cook'(i)(x)(a)]$

4. $\delta \to \lambda X\sigma x[X(x)]\,(\lambda x[inanimate'(i)(x) \wedge cook'(i)(x)(a)])$

5. $[CP_{FR,2}] \to \lambda X\sigma x[X(x)]\,(\lambda x[inanimate'(i)(x) \wedge cook'(i)(x)(a)])$
   $= \sigma x[inanimate'(i)(x) \wedge cook'(i)(x)(a)]$

6. *-ever* $\to \lambda x\lambda Q\ \forall i\text{-alternative} \in f(w)(s)\ [Q(i)(x(i))]$

7. $[CP_{FR,3}]_m \to$
   $\lambda x\lambda Q\ \forall i\text{-alternative} \in f(w)(s)\ [Q(i)\,(x(i))](\hat{}\sigma x[inanimate'(i)(x)\wedge cook'(i)(x)(a)])$
   $= \lambda Q\ \forall i\text{-alternative} \in f(w)(s)\ [Q(i)(\sigma x\,[inanimate'(i)(x)\wedge cook'(i)(x)(a)])]$

Matrix clause

8. $C' \to \lambda y\,[use\text{-}onions(i)(y)]$

FR + matrix clause

9. $CP \to \lambda Q\ \forall i\text{-alternative} \in f(w)(s)\ [Q(i)(\sigma x\,[inanimate'(i)(x) \wedge cook'(i)(x)(a)])]$
   $(\lambda y\,[use\text{-}onions(i)(y)])$
   $= \forall i\text{-alternative} \in f(w)(s)\ [use\text{-}onions'(i)(\sigma x\,[inanimate'(i)(x) \wedge cook'(i)(x)(a)])]$

4.4. Some objections to Dayal (1997)

4.4.1. Objection 1: the majority of who/*whoever

Although the contrast between *-ever* FRs and universally quantified DPs and the

parallelism between *-ever* FRs and definite DPs in (22) and (23) is real and intriguing, I do not find it totally convincing, because plural morphology on nouns seems to interfere. *Every* can be followed only by singular nouns (*every book* vs. *every books*), while *whatever* can take either singular or plural nouns (*whatever book* and *whatever books*). Although Dayal does not discuss this difference, this is crucial for her argument. If we replace the plural NPs *books* and *dishes* (22b) and (23b) with their singular forms, *-ever* FRs are no longer ambiguous, they exhibit only the distributive reading, i.e. the same reading as universally quantified DPs.

(34) a. Mary has read two thirds of <u>whatever book</u> is in the series.
     b. Mary ate only a portion of <u>whatever dish</u> she was served.

   (34a) cannot mean that Mary has read two thirds of the total number of books, nor can (34b) mean that Mary has eaten only part of the total number of dishes she was served. One could reply that this is due to the presupposition triggered by *whatever* and a singular countable noun: (34a) presupposes that there is only one book in the series and (34b) presupposes that there is only one dish that was served to Mary.

   We can obviate the disturbing factor of the semantic contribution of nominal morphology by looking at phrasal wh-words like *who* and *whoever*. FRs introduced by *who* and *whoever* do not have any uniqueness requirement: neither (35a) nor (35b) presuppose that the policeman arrested only one person. Still FRs introduced by *who* and *whoever* behave differently when they are preceded by a complex determiner like *the majority of*. It is no longer a contrast between ambiguous sentences and unambiguous ones, but between sentences that are acceptable/interpretable and sentences that are not.

Standard FRs with *who* exhibit the same level of acceptability with or without *the majority of* (cf. (35a) and (35a'), while *-ever* FRs with *whoever* are fine only without the complex determiner ((35b) *vs.* (35b')). Interestingly, definite DPs behave like standard FRs ((35d) *vs.* (35d')), while universally quantified DPs pattern with *-ever* FRs in this regard ((35c) *vs.* (35c')).

(35) a. * The policeman arrested who the FBI asked him to.
     a'. * The policeman arrested the majority of who the FBI asked him to, but not all of them.
     b.   The policeman arrested whoever the FBI asked him to.
     b'.?(?)The policeman arrested the majority of whoever the FBI asked him to, but not all of them.
     c.   The policeman arrested the people the FBI asked him to.
     c'.   The policeman arrested the majority of the people the FBI asked him to, but not all of them.
     d.   The policeman arrested everybody the FBI asked him to.
     d'. ?* The policeman arrested the majority of everybody the FBI asked him to, but not all of them.

A similar contrast is observed in Italian, with the advantage that standard FRs with *chi* 'who' are perfectly productive with no idiosyncratic restrictions (36).

(36) a.   [Chi era alla   manifestazione] indossava una maglietta rossa.
        who was at-the demonstration   wore   a   T-shirt   red
        'The people at the demonstration wore red T-shirts.'

     a'   <u>La maggior parte di</u> [chi era alla   manifestazione] indossava una maglietta rossa.
        the most   part of who was at-the demonstration   wore   a   T-shirt   red
        'Most people at the demonstration wore red T-shirts.'

     b.   [Chiunque era alla   manifestazione] indossava una maglietta rossa.
        whoever   was at-the demonstration   wore   a   T-shirt   red
        'Whoever was at the demonstration wore a red T-shirt.'

     b'.# <u>La maggior parte di</u> [chiunque era alla manifestazione] indossava una maglietta rossa.
        the most   part of whoever was at-the demonstration   wore   a   T-shirt   red
        'The majority of whoever was at the demonstration wore a red T-shirt.'

     c.   [Le persone alla   manifestazione] indossavano una maglietta rossa.
         the people   at-the demonstration   wore   a   T-shirt   red
        'The people at the demonstration wore a red T-shirt.'

     c'.   <u>La maggior parte del</u>le [persone alla   manifestazione] indossavano una maglietta rossa.
        the most   part of-the people at-the demonstration   wore   a   T-shirt   red
        '{The majority of/most} people at the demonstration wore a red T-shirt.'

     d.   [Ogni persona alla   manifestazione] indossava una maglietta rossa.
         every person at-the demonstration   wore   a   T-shirt   red
        'Everybody at the demonstration wore a red T-shirt.'

     d'.# <u>La maggior parte di</u> [ogni persona alla manifestazione] indossava una maglietta rossa.
        the most   part of every person at-the demonstration wore   a   T-shirt   red
        'The majority of every person at the demonstration wore a red T-shirt.'

   The contrast between *-ever* FRs on the one hand and standard FRs and definite DPs on the other in (35) and (36) is unexpected under Dayal's analysis. *-ever* FRs are predicted to behave like standard FRs because they are basically standard FRs evaluated over a set of worlds, rather than just in the actual world. Since the definite-like properties of

standard FRs, i.e. maximality, come from the lexical properties of wh-words,[7] and the semantics of -*ever* FRs is compositionally derived from that of standard FRs, -*ever* FRs are expected to exhibit maximality as well in each world of evaluation. But the data in (35) and (36) show that this is not the case.

4.4.2. Objection 2: quantificational variability

-*ever* FRs do not exhibit quantificational variability under adverbs of quantification. In this regard, they behave like quantified expressions and unlike definites and, crucially, unlike the corresponding DP-like standard FRs. I will show and discuss the relevant data in Chapter 5. Here I just want to point out that this behavior of -*ever* FRs is unexpected under Dayal's approach. According to her, the only kind of quantification that applies in -*ever* FRs is over i-alternatives, i.e. worlds. Therefore, adverbs of quantification, in particular adverbs of quantity like *for the most part*, are expected to be able to quantify over the entities denoted by -*ever* FRs, similarly to what they do with DP-like standard FRs. For instance, the Italian DP-like standard FR in (37a) is acceptable with or without the adverbial of quantification in bold. On the other hand, the corresponding -*ever* FR in (37b) is impossible to interpret with the same adverbial of quantification, while it is fully acceptable without. But, if I understand Dayal's proposal correctly, (37b) should be acceptable also with the adverbial and receive an interpretation like (37b').

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[7] Along the lines of Jacobson (1995) and Dayal (1995) (cf. Chapter 2, § ??).

(37) a. [_FR Chi è di origini meridionali] è (**in gran parte**) basso.
　　　 who is of origins Southern is in great part short.M.S
　　　 'People from Southern Italy are (for the most part) short.'

　　b. [_FR Chiunque è di origini meridionali] è (#**in gran parte)** basso.
　　　 whoever is of origins Southern is in great part short.M.S
　　　 'Whoever is from Southern Italy is (for the most part) short.'

　　b'. $\forall w[C(w)][\forall i\text{-alternative} \in f(w)(s)$ [MOST$_x$ [short(i)(x)] [from-Southern-Italy(i)(x)]]]]

4.4.3. Objection 3: [*whatever/whichever* + NP] *vs.* *[*what/which* + NP]

Dayal's proposal also makes another problematic prediction. Since the semantics of *-ever* FRs is basically the same as standard FRs plus the modality introduced by *-ever*, every *-ever* wh-word should have a corresponding bare wh-word introducing a standard FR. This prediction is not borne out.

I am not even referring to language specific idiosyncratic restrictions. (For instance, English allows *-ever* FRs with *whoever*, while standard FRs with *who* are much more restricted. On the other hand, standard FRs with *chi* 'who' and *-ever* FRs with *chiunque* 'whoever' are equally productive in Italian.) The crucial contrast I have in mind is illustrated in (38). While (38a) were fully acceptable in English, (38b) is not acceptable at all. This would be unexpected if (38a) is compositionally derived from (38b) by adding a modal dimension.

(38) a. I'll buy whatever/whichever book you buy.
　　b. *I'll buy what/which book you buy.

This pattern is cross-linguistically attested. Languages with *-ever* FRs of the kind [*whatever/whichever* NP] do not seem to have standard FRs of the kind [*what/which* NP].

An example of this contrast in Italian is given in (39).

(39) a. Comprerò   qualunque libro comprerai   tu.   *Italian*
           buy.FUT.1S whichever book buy.FUT.2S you.S
           'I'll buy whatever/whichever book you buy.'
     b *Comprerò   quale libro comprerai   tu.
           read.FUT.1S which book buy.FUT.2S you.S
           ('I'll buy which book you buy.')

Once again, the problem is rooted in Dayal's assumptions about the semantic contribution of wh-words. If maximality is part of the lexical meaning of wh-words, then there is no room for non-*ad-hoc* restrictions: all wh-words should trigger maximality. If the semantic contribution of (38a) is crucially based on that of (38b), then (38b) is expected to be acceptable and [*what/which* NP] should mean something very close to what [*the* NP] means.

Although I do not have an account for the contrast in (38)-(39), once again my approach to maximality and the semantic contribution of wh-words looks less problematic, as I will briefly discuss in the next section.

4.5. A suggestion about [*whatever/whichever* + NP] *vs.* *[*what/which* + NP]

In Chapter 2, I argued that maximality in DP-like standard FRs is not lexically triggered by wh-words, but results from a strategy of type-mismatch resolution between a predicate looking for an individual-denoting expression and an argument that denotes a set of individuals. If no type-mismatch of this kind occurs, this strategy cannot apply. For instance, (40a) is fully acceptable because the matrix predicate *buy* selects for an entity-denoting complement, the standard FR *what you buy* in complement position

denotes a sortally homogeneous set of entities, and the type-mismatch repairing strategy can apply. On the other hand, in (40b) the matrix predicate *buy* still selects for an entity-denoting complement, but *what/which book you buy* in complement position denotes neither an entity nor a set of entities nor a generalized quantifier. So, neither standard function application nor our type-mismatch repairing strategy can apply, and the sentence is unacceptable.

(40) a. I'll buy [what you buy].[8]
    b.*I'll buy [what/which book you buy].

But what does the bracketed string in (40b) denote? So far, I have always assumed that a wh-word introduces a variable into the logical representation that has the same type and syntactic category as the element the wh-word stands for. For instance, the logical representation of the standard FR in (40a) would be (41).[9]

(41) [$_{FR}$ what$_1$ Adam buy t$_1$] → $\lambda x_{1<e>}[buy(x_1)(a)]$

I will assume something similar for (40b), together with the assumption that the complex wh-phrase is interpreted *in situ* except for the wh-word (42).

(42) [[what/which]$_1$ Adam buys [t$_1$ book]] → $\lambda \mathbf{X}_{1<et,e>}[buy(\mathbf{X}_1(book)(a))]$

(42) denotes a set of functions each of which applies to a set of entities and returns an entity. This is different from both the entity required by the matrix predicate *buy* and the set of entities required for the type-mismatch repairing rule to apply. Therefore, the

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[8] I am assuming that *I'll buy* [*which you buy*] is ungrammatical because, unlike *what*, *which* is never a phrasal wh-word, but always takes a possibly covert NP complement.

[9] I replaced the personal pronoun *you* in (40a) with the proper noun *Adam* in order not to introduce irrelevant complication.

type-mismatch cannot be fixed and the whole sentence *I'll buy what/which book Adam buys* is unacceptable.

4.6. Conclusions

In this chapter, I introduced *-ever* FRs and I argued that they are FRs. Then I discussed their main semantic properties and some proposals that have been made to account for them. In particular, I presented Dayal (1997) in detail, since it is so far the most comprehensive and detailed attempt to spell out the semantic properties of *-ever* FRs and account for them compositionally. Her basic idea is that an *-ever* FR is a standard FR with an extra modal dimension and is interpreted with respect to a set of alternatives to the world of evaluation. In other words, *-ever* FRs are some sort of modalized definites. Crucially, Dayal assumes that wh-words encode maximality in their lexical meaning.

First, I showed how Dayal's proposal can be adapted to our conclusion that wh-words act as set restrictors. Then, I raised three objections to Dayal's proposal. Two of them deal with quantifying over *-ever* FRs: by means of a complex determiner like *the majority of* and by means of adverbials of quantification. In both cases, *-ever* FRs pattern like quantified DP and unlike definites, while Dayal's proposal would predict the opposite pattern. The third objection deals with the contrast between the cross-linguistically attested *-ever* FRs introduced by *whatever/whichever* + NP and the cross-linguistic ban on DP-like standard FRs introduced by *what/which* + NP.

Although I did not present an alternative analysis for *-ever* FRs that can account for the three objections above, I think that my assumptions about the meaning of wh-words and

how to derive maximality for standard FRs are less problematic than Dayal's and offer more space for a possible solution of this puzzle. Before concluding, I will briefly mention why.

In Chapter 2, I proposed that standard FRs end up denoting a maximal individual by combining with δ, as a last resort option to fix a type-mismatch. Since this is a default strategy, it does not apply if other options are available. In Chapter 3, I argued that this strategy does not apply to existential FRs since no type-mismatch occurs. The free variable introduced by the wh-word ends up being bound by the existential quantifier introduced by the matrix predicate. *-ever* FRs may be a similar example. The suffix *-ever* and its cross-linguistic equivalents may behave like a determiner-like element that takes a set-denoting expression and returns a generalized quantifier.

Along a similar line, I suggested that the reason why *-ever* FRs introduced by *whatever/whichever* + NP are cross-linguistically attested, while DP-like standard FRs introduced by *what/which* + NP are not, is because *what*/*which* do not introduce a variable of type <e> when they occur before an N, but rather a variable of a higher type. Therefore, the type-mismatch repairing strategy I proposed for DP-like standard FRs cannot apply. DP-like standard FRs introduced by *what*/*which* + NP cannot fix the type-mismatch in any other way, therefore they are unacceptable. On the contrary, the type mismatch of *-ever* FRs introduced by *whatever/whichever* + NP can be solved by the quantificational properties of the *-ever* morpheme. Further research is needed to establish the precise properties of this element.

CHAPTER 5

Quantificational Variability in Free Relatives

5.1. Introduction

This chapter is devoted to discussing quantificational variability in FRs and what it tells us about the semantic contribution of FRs. The chapter is divided into two main parts. In the first part, I briefly introduce adverbials of quantification, quantificational variability effects with indefinites and wh-INTs, and how these effects have been used to argue that indefinites and wh-phrases do not have any quantificational force of their own (§ 5.2). I will conclude with two generalizations about kinds of DPs and the availability of quantificational variability effects (§ 5.3). In the second part (§ 5.4), I look at the behavior of adverbials of quantification with existential FRs (§ 5.4.2), *-ever* FRs (§ 5.4.3), and DP-like standard FRs (§ 5.4.1). As we will see, only the latter exhibit quantificational variability. The aim of this chapter is not to give an account for quantificational variability in FRs, let alone in DPs. Its only purpose is to show that way DP-like standard FRs interact with adverbials of quantification is the same as definite DPs, while existential FRs and *-ever* FRs pattern like quantified DPs. In other words, quantificational variability further supports the conclusions we independently reached in the previous chapter about the semantic properties of the different kinds of FRs.

5.2. Adverbials of quantification

The adverbs and the adverbial phrases (henceforth, *adverbials* for both) in (1) have been

labeled *adverbials of quantification* in the literature.[1] I have borrowed both the examples

and the subdivision into *adverbials of frequency* and *adverbials of quantity* from Lahiri

(2002).

(1) **Adverbials of quantification**
  a. <u>Adverbials of frequency</u>
      seldom, usually, always, often, generally, commonly, in general, frequently, mostly,
      rarely, now and then, in many cases, sometimes, never
  b. <u>Adverbials of quantity</u>
      mostly, for the most part, partly, in part, largely, to a great extent, to some extent, with
      few exceptions, completely

Adverbials of quantification owe their name to the fact that they have been seen as

being able to influence the quantificational properties of certain expressions within the

sentence in which they occur (a.k.a. quantificational variability effects). For instance,

adverbials of frequency have been claimed to modify (Lewis 1975) or determine (Heim

1982: Chapter 2) the quantificational properties of indefinites. In (2), three pairs of

examples are given, such that the sentences in each pair are truth-conditionally

equivalent. Crucially, the first sentence of each pair contains an indefinite DP (in a box)

and an adverbial of frequency (in bold), while the second sentence lacks the adverbial of

frequency and has the indefinite turned into a quantified DP (with the NP complement in

a box and the quantifier in bold).

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[1] Actually, *adverbs of quantification* is the term usually found in the literature. I will keep using *adverbials of quantification* to make clear that I am referring to adverbial phrases as well.

(2) a. A basketball player is **always** tall.
   a'. **Every** basketball player is tall.

   b. **Sometimes**, a basketball player is tall.
   b'. **Some** basketball players are tall.

   c. A basketball player is **never** tall.
   c'. **No** basketball players are tall.

    Heim (1982) and many others after her take the truth-conditional equivalences in (2) as evidence that indefinites lack their own quantificational force and their semantic contribution is just to introduce a free variable into the representation.

    Developing a suggestion by Nishigauchi (1986; 1990), Berman (1991; 1994) argues that adverbials of quantification can determine the quantificational force of wh-phrases as well, both in wh-INTs and in standard FRs. Berman gives examples like the ones in (3) and claims that they are truth-conditionally equivalent.[2]

(3) a. The principal **usually** finds out [_wh-INT which students cheat on the final exam].
   a'. For **most** students who cheat on the final exam, the principal finds out of them that they cheat on the final exam.

   b. **With few exceptions**, Mary knows [_wh-INT which students submitted which abstracts to which conferences].
   b'. For **most** triples of a student, an abstract and a conference such that the student submitted the abstract to the conference, Mary knows that the student submitted the abstract to the conference.

   c. Maria **seldom** likes [_FR who she meets].
   c'. **Few** people Maria meets are such that she likes them.

   d. [_FR What Sue paints] is **often** beautiful.
   d'. **Many** things Sue paints (i.e. many paintings by Sue) are beautiful.

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[2] All the examples in (3) are from Berman (1994: 40-41; 48-49).

The first sentence of each pair in (3) contains a wh-phrase (in a box) and an adverbial of frequency (in bold), while the second sentence lacks the adverbial of quantification and has the wh-phrase replaced with a quantified DP (with the noun in a box and the quantifier in bold). Along the lines of Heim's (1982) treatment for indefinites, Berman concludes that wh-phrases do not have quantificational force of their own, they just introduce a free variable into the representation.

Heim's and Berman's conclusions about quantificational variability effects are not the only possible ones. For instance, Chierchia (1988, 1992) and de Swart (1991) argue that adverbials of frequency quantify behave like Generalized Quantifiers over events or situations and the apparent quantification over entities is just an outcome of the interaction between entities and events or situations. On this view, more faithful paraphrases of the examples in (2a) and (3a) would be the ones in (4a) and (4b), respectively.

(4) a. **For every relevant (minimal) situation**, a basketball player in that situation is tall.
b. **For most relevant (minimal) situations**, the principal finds out
[$_{wh\text{-}INT}$ which students in that situation cheat on the final exam].

Also, as Lahiri (2002) points out, indefinites and wh-phrases exhibit asymmetries in their interaction with adverbials of quantification. While both show quantificational variability with adverbials of frequency, only wh-phrases are sensitive to adverbials of quantity, as shown in (5).

(5) a. A basketball player is {**often/*for the most part**} tall.
b. [$_{FR}$ What you find at Wild Oats] is {**often/for the most part**} really expensive.
c. The principal **usually/for the most part** finds out [$_{wh\text{-}INT}$ which students cheat on the final exam].

So, it is not clear whether adverbials of frequency and adverbials of quantity really form one class, and whether quantificational variability effects really argue for indefinites and wh-phrases to be semantically the same and for both to introduce a free variable into the representation. I will be non-committal on these issues, since the use I am going to make of quantificational variability in relation to FRs does not hinge on them. I refer the interested reader to de Swart (1991) for a detailed discussion of adverbials of frequency and the different proposals that have been made to account for their semantic behavior. I am not aware of any proposal for adverbials of quantity, except for the one in Lahiri (2002), which only deals with the interaction of adverbials of quantification with embedded wh-INTs.

5.3. Adverbials of quantification and kinds of DPs

In the previous chapters, we saw that ways to paraphrase FRs have been suggested that make use of different kinds of DPs. I briefly recapitulate these claims with the examples in (6). For the sake of readability, the examples are from English, whenever possible. *FR* stands for a DP-like standard FR.

(6) *Kinds of DPs that can paraphrase FRs*

    a. **Definite DPs**:
    Jie ate [FR what Adam cooked]/[DP <u>the thing(s)/the food</u> Adam cooked].

    b. **Generic bare plural DPs**:
    I don't like ?[FR where it is too dark]/[DP <u>places</u> where it is too dark].

    c. **Non-generic bare plural DPs**:
      1) I have [exist. FR what to eat]/[DP <u>things</u> to eat].   *New York English*
      2) Non ho [exist. FR con chi   parlare] /[DP <u>persone</u> con cui parlare]. *Italian*
         not have.1S   with who speak.INF /   people with REL speak.INF
         'I don't have people to talk to.'

    d. **Generic indefinite DPs**:
    [FR Chi dorme male] /[DP <u>Una persona</u> che dorme male] si sente sempre triste. *Italian*
       who sleeps poorly /   a   person   that sleeps poorly CL feels always sad
    'A person who sleeps poorly always feels sad.'

    e. **Non-generic indefinite DPs**:
      1) I have [exist. FR what to eat]/[DP <u>something</u> to eat].   *New York English*
      2) Ho [exist. FR con chi parlare] /[DP <u>delle persone</u> con cui parlare]. *Italian*
         have.1S   with who speak.INF /   some people with REL speak.INF
         'I have someone/some people to talk to.'

    f. **Universally quantified DPs**:
      1) Jie ate [FR what Adam cooked]/[DP <u>everything/all the things</u> Adam cooked].
      2) ?[*-ever* FR Whoever sleeps poorly]/[DP <u>Everybody</u> who sleeps poorly] always feels sad.

If the paraphrases above are correct, we expect each pair FR/DP to exhibit the same quantificational variability effects. The remainder of the chapter is devoted to testing this expectation and showing how the results give further support to our conclusions about the semantic properties of FRs from the previous chapters.

The behavior of the six kinds of DP in (6) with respect to quantificational variability can be summarized by means of the following generalizations:

(7) *Generalizations about quantificational variability effects of some DPs*

Generalization 1: adverbials of frequency. Universally quantified DPs, non-generic bare plural DPs and non-generic indefinite DPs do not show quantificational variability effects with adverbials of frequency; all the other DPs in (6) do.

Generalization 2: **adverbials of quantity**. Plural definite DPs and generic bare plural DPs show quantificational variability effects with adverbials of quantity; all the other DPs in (6) do not.

Table 1 spells out the generalizations in (7). The parenthesized number in each box with YES or NO refer to the example in (8) and (9) that illustrates that claim. Whenever possible, I have given examples in which nothing else but the adverbial of quantification in bold can interact with the underlined DP, so that the impossibility of this interaction results in the unacceptability of the whole sentence.

Table 1. Quantificational variability effects according to DPs and adverbials

	Adverbials of frequency	**Adverbials of quantity**
Definite DPs	YES (8a)	YES (9a)
Generic bare plural DPs	YES (8b)	YES (9b)
Non-generic bare plural DPs	NO (8c)	NO (9c)
Generic indefinite DPs	YES (8d)	NO (9d)
Non-generic indefinite DPs	NO (8e)	NO (9e)
Universally quantified DPs	NO (8f)	NO (9f)

(8)   *DPs and adverbials of frequency*
    a. <u>The cakes Adam bakes</u> are **often** very good.
      =**Many**/**most** <u>cakes Adam bakes</u> are very good.

    b. <u>Italians from the South</u> are **often** dark-skinned.
      = **Many**/**most** <u>Italians from the South</u> are dark-skinned.

    c. I **often** have <u>people I can talk to</u> when I am sad.
      ≠ I have **many/*most** <u>people I can talk to</u> when I am sad.

    d. <u>An Italian from the South</u> is **often** dark-skinned.
      = **Many**/**most** <u>Italian from the South</u> are dark-skinned.

    e.#<u>Some Italians from the South</u> are **often** dark-skinned.
      ≠ **Many**/**most** <u>Italians from the South</u> are dark-skinned.

    f.# <u>Every Italian from the South</u> is **often** dark-skinned.
      ≠ **Many**/**most** <u>Italians from the South</u> are dark-skinned.

(9)   *DPs and adverbials of quantity*
    a. <u>The Italians from the South who I know</u> are **for the most part** dark-skinned.
      = **Many**/**most** <u>Italians from the South who I know</u> are dark-skinned.

    b. <u>Italians from the South</u> are **for the most part** dark-skinned.
      = **Many**/**most** <u>Italians from the South</u> are dark-skinned.

    c. For the most part, I have <u>people I can talk to</u> when I am sad.
      ≠ I have **many/*most** <u>people I can talk to</u> when I am sad.

    d.#<u>An Italian from the South</u> is **for the most part** dark-skinned.
      ≠ **Many**/**most** <u>Italians from the South</u> are dark-skinned.

    e.#<u>Some Italians from the South</u> are **for the most part** dark-skinned.
      ≠ **Many**/**most** <u>Italians from the South</u> are dark-skinned.

    f.# <u>Every Italian from the South</u> is **for the most part** dark-skinned.
      ≠ **Many**/**most** <u>Italians from the South</u> are dark-skinned.

5.4. Quantificational variability effects in free relatives[3]

In this section, I am going to look at the presence or absence of quantificational variability effects in different kinds of FRs. The results of this short investigation will be interpreted in light of the generalizations in (7) and will be used to further support the main conclusions about the semantic contribution of FRs from the previous chapters. I will start by discussing DP-like standard FRs (§ 5.4.1), then I will move to existential FRs (§ 5.4.2), and I will conclude with *-ever* FRs (§ 5.4.3). As we will see, DP-like standard FRs exhibit quantificational variability under adverbials of quantification and therefore pattern like plural definites and generic bare plurals, while existential FRs and *-ever* FRs pattern like quantified expressions, since they do not show quantificational variability.

I will not discuss PP-like standard FRs since quantificational variability is hard to test with them because of independent constraints. The easiest configuration for a constituent to exhibit quantificational variability is subject position, but PP-like standard FRs can never occur in subject position by definition.

5.4.1. DP-like standard free relatives

In Chapter 2, we concluded that DP-like standard FRs are semantically very close to definite DPs since they both denote a maximal entity. If this conclusion is correct, it predicts DP-like standard FRs to behave like definite DPs as far as their interaction with

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[3] Quatificational variability in standard FRs was first discussed in Berman (1991; 1994) for English. Wiltschko (1998) briefly mentions it as well. Gutiérrez-Rexach (1999) discusses quantificational variability in Spanish standard and *-ever* FRs. Recently, Hinterwimmer (2003) discussed quantificational variability in FRs by looking at English and German data.

adverbials of quantification is concerned. This predication is borne out, as will be shown

in § 5.4.1.1 and § 5.4.1.2.

5.4.1.1 Quantificational variability with adverbials of frequency

DP-like standard FRs show quantificational variability with adverbials of frequency. (10)

gives examples from English. Each of them is paired with the sentence resulting from

replacing the DP-like standard FR with a quantified DP that roughly paraphrases it.

(10) a. [FR What you find at a yard sale] is **often** junk.
    a'. [DP **Many** things you find at a yard sale] are junk.

   b. I almost **never** like [FR where he takes me to dinner], but the restaurant we went to last
       night was not bad at all.
   b'. I like [DP almost **none** of the places he takes me to dinner], but the restaurant we went to
       last night was not bad at all.

   c. I **always** hate [FR when you yell like that].
   c'. I hate [DP **every** occasion when you yell like that].

   d. [FR How he dances] **often** looks really ridiculous.
   d'. [DP Many of the ways he dances] look really ridiculous.

DP-like standard FRs in Italian behave the same. I will give just an example with *chi*

'who' to show that the reason why I did not give an example with *who* in (10) is just

because this kind of DP-like standard FR is not very productive in English (cf. Chapter

1), and not because there is anything special about it in relation to adverbials of

frequency.

(11) a. [FR Chi è di origini meridionali] è **spesso** basso. *Italian*
who is of origins Southern is often short.M.S
'A person who is from Southern Italy is often short.'/'People from Southern Italy are
often short.'

b. [DP Molte persone di origini meridionali] sono basse.
many people.F.P of origins Southern are.3P short.F.P
'Many people from Southern Italy are short.'

The examples in (10) and (11) clearly show that DP-like standard FRs exhibit quantificational variability with adverbials of frequency. If we compare the behavior of DP-like standard FRs and the behavior of the different kinds of DPs listed in § 5.3 with respect to adverbials of frequency, we see that DP-like standard FRs do not pattern like universally quantified DPs, non-generic bare plural DPs, or non-generic indefinite DPs. This brings further evidence against the hypothesis that DP-like standard FRs are universally quantified DPs or non-generic indefinites and it is fully compatible with our conclusion in Chapter 2 that DP-like standard FRs semantically behave like definite DPs.

5.4.1.2 Quantificational variability with adverbials of quantity

DP-like standard FRs introduced by *what* exhibit quantificational variability effects with adverbials of quantity, as shown in (12).

(12) a. [FR What I bought at the yard sale] is **for the most part** junk.
= [DP **Most** (of the) things I bought at the yard sale] are junk.

b. [FR What I bought at the yard sale] is **in part** junk.
= [DP **Some** of the things I bought at the yard sale] are junk.

DP-like standard FRs introduced by *chi* 'who' in Italian exhibit similar effects, as shown in (13).

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(13) a.(?) [Chi è <u>di sinistra</u>] ha **in gran parte** votato contro Berlusconi alle ultime elezioni.
         who is of left   has in great part voted against B.   at-the last   elections
         'Most leftists voted against Berlusconi in the last elections.'
   b. .(?) [Chi è <u>di sinistra</u>] ha solo **in parte** votato contro Berlusconi alle ultime elezioni.
         who is of left   has only in part voted against B.   at-the last   elections
         'Only some leftists voted against Berlusconi in the last elections.'

The examples in (12) and (13) above show that DP-like standard FRs behave like definite DPs and bare plurals as far as exhibit quantificational variability effects with adverbials of frequency.

In the following two excursus, I will briefly discuss two reasons that make the interaction between adverbials of quantity and DP-like standard FRs hard to study. Although interesting, they are not crucial and the reader can skip them and move to the conclusions of this section in § 5.4.1.3.

5.4.1.2.1 EXCURSUS 1: Two requirements about the matrix clause: episodicity and subject position

The reason why I gave examples with only two wh-words in (12) and (13) is because two requirements have to be satisfied to make quantificational variability with adverbials of quantity more easily available: 1) the matrix clause must be episodic and 2) the DP-like standard FR must be in the matrix subject position. I will discuss both requirements in turn.

The requirement for the matrix clause to be episodic has a plausible motivation: it prevents the adverbials from quantifying over events/situations. For instance, while (12a) above was not ambiguous, its habitual/generic counterpart in (14a) is: it can be paraphrased as in (14b) or (14c).

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(14) a. [FR What I buy at yard sales] is **for the most part** junk.
   b. [DP **Most** (of the) things I buy at yard sales] are junk.
   c. **Most of the time**, [DP the things I buy at yard sales] are junk.

(14b) and (14c) are not truth-conditionally equivalent. In a situation in which I have been to ten yard sales and at one of those everything I bought was really great, (14c) would be true, while (14b) would be false.

The requirement for the matrix clause to be episodic is problematic in English because, for reasons that are not clear to me, episodic sentences with a DP-like standard FR introduced by anything other than *what* in English are either degraded ((15a) *vs.* (15b)) or interpreted as denoting only one atomic entity (16). As I will discuss later, it is crucial in order for an adverbial of quantity to quantify over an expression that the expression denote a plural entity or any other complex entity that is made of parts (e.g. collective or mass nouns).

(15) a.   I like [who you like].
    b.?? In our first year in college, I liked [who you liked]. [good in the habitual reading!!]

(16) a.   I really like [where he takes me out to dinner].
       = I really like the places he takes me out to dinner.
    b.   I like [where he has taken me out to dinner in the past few months].
       = I really like the place/#the places he has taken me out to dinner in the past few months.

The second problematic requirement is the requirement for the DP-like standard FR to be in the matrix subject position. In (17), I move the DP-like standard FR in (12a) from the subject position to the position of complement of a verb (17a) or a preposition (17c) and the quantificational variability effects are not as easily available or are not available at all.

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(17) a. For the most part, I sent my mum [what I bought at the yard sale].
         ≠ I sent my mum most of what I bought at the yard sale.
     b. For the most part, I talked about [what I bought at the yard sale].
         ≠ I talked about most of the things I bought at the yard sale.

This requirement is problematic because, in subject position, DP-like standard FRs introduced by *who* are unacceptable in English (no matter whether they are generic (18a) or episodic (18b)), while all the other DP-like standard FRs (except those with *what*) are interpreted as referring to only one atomic entity in an episodic contest ((19a) *vs.* (19b)).

(18) a.*[Who is a communist] certainly doesn't vote for Bush.
     b.*[Who wrote this book] was put in jail for the rest of his life.

(19) a. Where he has taken me out to dinner in the past few months is really great.
     b. = The place he has taken me out to dinner in the past few months is really great.
     b'. ≠ The places he has taken me out to dinner in the past few months are really great.

Italian exhibits both kinds of restrictions with DP-like standard FRs introduced by the equivalents of *where, when* and *how* (remember that Italian does not allow FRs with the equivalent of *what*). As for DP-like standard FRs with *chi* 'who', they still need to occur in matrix subject position in order for quantificational variability to be easily detected, but they do not exhibit any constraint concerning episodicity. (20) shows that the Italian equivalents of the unacceptable English FRs in (18) are fully acceptable.

(20) a. [Chi è di sinistra] non vota   certo   a favore di Bush.
         who is of left   not votes for-sure in favor   of Bush
         'Leftists don't vote for Bush for sure.'
     b. [Chi   ha   scritto questo libro] fu   messo in prigione per il   resto della sua vita.
          who has written this   book was put   in jail   for the rest of-the his life
         'The person who wrote this book was put in jail for the rest of his life.'

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5.4.1.2.2 Excursus 2: number morphology

DP-like standard FRs introduced by *chi* 'who' in Italian show quantificational variability with adverbials of quantity, unless the predicate in the FR or in the matrix clause is a morphologically singular adjective or noun.[4] For instance, while (21a) is basically fully acceptable and exhibits quantificational variability (as shown by the translation), (21b) is severely degraded. The only difference between the two sentences is in the underlined predicate of the FR: if it is a PP and therefore does not show agreement with the wh-word in subject position, then the resulting sentence is acceptable (21a); if it is an agreeing adjective, the sentence is unacceptable (21b).

(21) a.(?) [Chi è di sinistra] ha **in gran parte** votato contro Berlusconi alle ultime elezioni.
　　　　 who is of left　　 has in great part voted against B.　　 at-the last elections
　　　　 'Most leftists voted against Berlusconi in the last elections.'
　　 b.?* [Chi è comunista]　 ha **in gran parte** votato contro Berlusconi alle ultime elezioni.
　　　　 who is communist.S has in great part voted against B.　　 at-the last elections

The contrast in (21) holds even if we switch the two predicates, so that now it is the underlined matrix predicate that exhibits the alternation between the agreeing adjectival form and the non-agreeing PP form (22).

(22) a.(?) [Chi ha votato contro Berlusconi alle ultime elezioni] era **in gran parte** di sinistra.
　　　　 who has voted against B.　　 at-the last election was in great part of left
　　　　 'Most people who voted against Berlusconi at the last elections were leftists.'
　　 b.* [Chi ha votato contro Berlusconi alle ultime elezioni] era **in gran parte** comunista.
　　　　 who has voted against B.　　 at-the last election was in great part comunist.S

Spanish gives further support to the observation that number morphology plays a crucial role, since it has two forms for 'who': *quien*, which is singular, and *quienes*,

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[4] Adjectival and nominal predicates always agree in number with their subject in Italian.

which is plural. DP-like standard FRs with *quien* (23a) show the same restrictions with adverbials of quantity as the equivalents in Italian (23c). Crucially, DP-like standard FRs with *quienes* do not exhibit any restrictions and pattern like plural definites (23b).

(23) a.*[_{FR} Quien es del   sur]   es **en gran parte** bajo.   *Spanish*
         who.S is of-the South is in great part   short.S
      ('A person from the South is for the most part short.')
    b. [_{FR} Quienes son   del   sur] son   **en gran parte** bajos.
          who.P   are.3P of-the south are3P in great part   short.P
      'Most people from the South are short.'
    c.*[_{FR} Chi   è di origini meridionali] è **in gran parte** basso.   *Italian*
          who.S is of origins Southern   is in great part   short.S
      ('A person from Southern Italy is for the most part short.')

In Italian, if the predicate in the FR is collective (e.g. *riunirsi* 'gather') and the matrix predicate is a PP (e.g. *in favore dello sciopero* 'in favor of the strike'), then the FR exhibits quantificational variability as well:

(24) (?) [Chi si è riunito   in assemblea] è **in gran parte** a favore dello sciopero.
        who CL is gathered.S in meeting   is in great part   in favor   of-the strike
        'Most people who are meeting are in favor of the strike.'

The reason why (24) is particularly interesting is that singular morphology does not seem to play the same role with verbal predicates. The past participle form *riunito* is morphologically singular, *riuniti* being the plural form, and it agrees with its morphologically singular subject *chi*. Nevertheless, intuitions are clear that the FR denotes a plural individual, since one single person cannot gather. Similarly, both the verbal predicate and the copula in (21a) and (22a) agree in singular number with their subject *chi*, nevertheless the sentences are acceptable and exhibit quantificational variability.

A tentative conclusion could be that there are verbal and PP predicates that are inherently collective (i.e. they can denote a set with only plural entities) or mixed (i.e. they can denote a set with both plural and atomic individuals), regardless of their number morphology or without any number morphology at all. On the other hand, singular adjectival or nominal predicates can be only distributive (i.e. they denote a set with only atomic entities) and need plural morphology to add plural entities to their denotation.

5.4.1.3 Conclusions on quantificational variability in DP-like standard FRs

As summarized in Table 2, DP-like standard FRs pattern like definites, generic bare plurals and generic indefinites with respect to quantificational variability effects under adverbs of frequency, while they pattern like definites and generic bare plurals with respect to adverbials of quantity.

Table 2. Quantification variability effects in DP-like standard FRs

	Adverbials of frequency	**Adverbials of quantity**
DP-like standard FRs	YES **= definites** **= generic bare plurals** **= generic indefinites** ≠ universals ≠ non-generic bare plurals ≠ non-generic indefinite	YES **= definites** **= generic bare plurals** ≠ generic indefinites ≠ universals ≠ non-generic bare plurals ≠ non-generic indefinite

In conclusion, the behavior of DP-like standard FRs under adverbials of quantification is the same as that of definites and generic bare plurals. This is the same conclusion we reached in Chapter 2 on completely independent grounds.

5.4.2. Existential FRs

In Chapter 3, we concluded that existential FRs semantically behave like (existentially) quantified expressions. If this conclusion is correct, we expect existential FRs to behave like other (existentially) quantified expressions also as far as their interaction with adverbials of quantification is concerned. This predication is borne out. Existential FRs never exhibit quantificational variability. When they occur with adverbials of frequency their quantificational force is never modified by the adverbials, but it is always the existential force (25).

(25) *adverbials of frequency*

   a. **Spesso** ho   [con chi parlare]   quando sono triste.   *Italian*
      often   have.1S with who speak.INF when   am   sad
      'I often have somebody to talk to when I am sad.'
      ≠ 'I have many people to talk to when I am sad.'

   b. **Spesso** non ha [di che   parlare alle   conferenze].
      often   not has of what talk.INF to-the conferences
      'He often doesn't have anything to say at conferences.'
      ≠'He doesn't have many things to say at conferences.'

   c. **Spesso** non avevo [dove   nascondermi] in caso di pericolo.
      often   not had.1S where hide.INF   in case of danger
      'Often I didn't have a place where I could hide in case of danger.'
      ≠ 'I didn't have many places where I could hide in case of danger.'

It follows from the data in (25) and Generalization 1 in (7) that existential FRs cannot be definites, or generic indefinites, or generic bare plurals; whereas their behavior is compatible with them being universally quantified expressions, non-generic bare plurals and non-generic indefinites.

When existential FRs occur with adverbials of quantity the result is just uninterpretable

(26).

(26) *adverbials of quantity*

    a.#**In gran parte** ho   [con chi parlare]   quando sono triste.   *Italian*
      in great part   have.1S with who speak.INF when am sad
      ('For the most part, I have somebody to talk to when I am sad.')

    b.#**In parte** non ha   [di che parlare alle   conferenze].
      in part   not has of what talk.INF to-the conferences
      (Partly, he doesn't have anything to say at the conferences.')

    c.#**In minima   parte** non avevo [dove nascondermi] in caso di pericolo.
      in very-little part   not had.1S where hide.INF   in case of danger
      ('To a small extent, I didn't have a place where I could hide in case of danger.')

It follows from the data in (26) and Generalization 2 in (7) that existential FRs cannot be definites or generic bare plurals. Their behavior under adverbials of quantity would be compatible with them being universally quantified expressions, non-generic bare plurals, non-generic indefinites or generic indefinites. But the last option has already been ruled out by the data in (25) and Generalization 1.

In conclusion, the quantificational variability behavior of existential FRs under adverbials of quantification (cf. table 3) shows that existential FRs behave like quantified expressions. In fact, what universally quantified DPs, non-generic bare plurals and non-generic indefinites have in common is that they all involve some quantification, either of the universal or existential type (for non-generic bare plurals and indefinites). This is fully compatible with our analysis in Chapter 3, according to which existential FRs are always existentially quantified.

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Table 3. Quantificational variability effects in existential FRs

	Adverbials of frequency	Adverbials of quantity
Existential FRs	NO **= universals** **= non-generic bare plurals** **= non-generic indefinite** ≠ generic indefinites ≠ definites ≠ generic bare plurals	NO **= universals** **= non-generic bare plurals** **= non-generic indefinite** **= generic indefinites** ≠ definites ≠ generic bare plurals

5.4.3. -ever FRs

-ever FRs do not exhibit quantificational variability. When they occur with adverbials of frequency, their quantificational force is never modified by the adverbials. Sometimes the results are even uninterpretable. This is shown in (27) for Italian and (28) for English. Each of the *-ever* FRs in (27)-(28) is paired with the sentence resulting from replacing the *-ever* FR with the quantified DP that would be expected to roughly paraphrase it, if the adverbial of frequency could quantify over the *-ever* FR.

(27) a. Chissà   perché, ma [FR chiunque è di origini meridionali] (#**raramente**) è alto.
        who-knows why   but   whoever is of origins Southern   rarely   is tall.M.S
        'I don't know why but whoever is from Southern Italy is (rarely) tall.'
        ≠ [DP **Few** people from Southern Italy] are tall.

   b. Chissà   perché, ma [FR qualunque libro compro] è (#**spesso**) una schifezza.
        who-knows why   but   whatever book buy.1S   is   often   a   junk
        'I don't why, but whatever book I buy is (often) junk.'
        ≠ [DP **Many/most** books I buy] are junk.

   c. (#**A volte**) le   piaceva   [FR dovunque ci   fossero   le montagne].
         at times   to-her.CL pleased.IMPERF.3S everywhere there be.SUBJ.IMPERF the mountains
        '(Sometimes) she liked wherever there were mountains.'
        ≠ She liked [DP **some** places where there were mountains].

(28) a. [FR Whoever comes from Southern Italy] is **rarely** tall.
≠ [DP **Few** people from Southern Italy] are tall.

b. [FR Whatever you find at a yard sale] is **often** junk.
≠ [DP **Many** things you find at a yard sale] are junk.

c. I **rarely** like [FR wherever he takes me to dinner].
≠ I like [DP **few** places he takes me to dinner].

d. I **often** hate [FR whenever you yell like that].
≠ I hate [DP **many** occasions when you yell like that].

e. [FR However she dresses] is **often** very original.
≠ [DP **Many** ways she dresses] are very original.

It follows from the data in (27)-(28) and Generalization 1 in (7) that *-ever* FRs cannot be definites, or generic indefinites, or generic bare plurals, whereas their behavior is compatible with them being universally quantified expressions, non-generic bare plurals or non-generic indefinites.

When *-ever* FRs occur with adverbials of quantity their quantificational force is never modified by the adverbials (29).

(29) a. [FR Chiunque è di origini meridionali] è (#**in parte**) alto.
    whoever is of origins Southern is in part tall.M.S
 'Whoever is from Southern Italy is (in part) tall.'
 ≠ [DP **Some** people from Southern Italy] are tall.

b. [FR Qualunque libro compro] è (#**in gran parte**) costoso.
    whatever book buy.1S is in great part expensive
 'Whatever book I buy is (for the most part) expensive.'
 ≠ [DP **Many/most** books I buy] are expensive.

c. (#**In parte**) le piaceva [FR dovunque ci fossero le montagne].
    in part to-her.CL pleased.IMPERF.3S everywhere there be.SUBJ.IMPERF the mountains
 '(To some extent), she liked wherever there were mountains.'
 ≠ She liked [DP **some** places where there were mountains].

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(30) a. [FR Whoever comes from Southern Italy] is (#**for the most part**) tall.
≠ [DP **Most** people from Southern Italy] are tall.

b. [FR Whatever clothes you find at a yard sale] are (#**for the most part**) cheap.
≠ [DP **Most** clothes you find at a yard sale] are cheap.

c. [FR Wherever he takes me to dinner] is (#**for the most part**) fabulous.
≠ [DP **Most** places he takes me to dinner] are fabulous.

d. [FR However she dresses] is (#**to some extent**) very original.
≠ [DP **Some** ways she dresses] are very original.

It follows from the data in (29)-(30) and Generalization 2 in (7) that *-ever* FRs cannot be definites or generic bare plurals. Their behavior under adverbials of quantity would be compatible with them being universally quantified expressions, non-generic bare plurals, non-generic indefinites and generic indefinites. But the last option has already been ruled out by the data in (27)-(28) and Generalization 1 in (7).

In conclusion, similarly to what we concluded about existential FRs, the quantificational variability behavior of *-ever* FRs under adverbials of quantification (cf. table 4) shows that *-ever* FRs behave like quantified expressions. This is compatible with our discussion of *-ever* FRs in Chapter 4. In particular, it shows that an analysis of *-ever* FRs as modalized definites à la Dayal (1997) would not have a direct way to account for the data in (29)-(30), since plural definites are fully compatible with adverbials of quantity, while *-ever* FRs are not (cf. Chapter 4).

Table 4. Quantificational variability effects in -ever FRs

	Adverbials of frequency	**Adverbials of quantity**
-ever **FRs**	NO **= universals** **= non-generic bare plurals** **= non-generic indefinite** ≠ generic indefinites ≠ definites ≠ generic bare plurals	NO **= universals** **= non-generic bare plurals** **= non-generic indefinite** **= generic indefinites** ≠ definites ≠ generic bare plurals

5.5. Conclusion

In this chapter, I showed that, while existential FRs and *-ever* FRs do not exhibit quantificational variability effects under adverbials of quantification, DP-like standard FRs do. Looking at what kinds of DPs can occur with adverbials of quantification, I conclude that DP-like standard FRs pattern like plural definites and generic bare plurals, while existential FRs and *-ever* FRs pattern like quantified expressions. These conclusions are consistent with and give further support to the analyses and/or generalizations in Chapters 2-4.

Table 5. Quantificational variability effects in FRs and DP

	Adverbials of frequency	**Adverbials of quantity**
DP-like standard FRs (§ 5.4.1)	YES	YES
existential FRs (§ 5.4.2)	NO	NO
-ever **FRs** (§ 5.4.3)	NO	NO
Definite DPs	YES	YES
Generic bare plural DPs	YES	YES
Generic indefinite DPs	YES	NO
Non-generic bare plural DPs	NO	NO
Non-generic indefinite DPs	NO	NO
Universally quantified DPs	NO	NO

CHAPTER 6

A quick look at wh-interrogatives

In this brief last chapter, I will sketch how the conclusions about the semantic contributions of phrasal wh-words in FRs from the previous chapters can be applied to the most common and studied case of wh-constructions, i.e. wh-interrogatives (wh-INTs).

A discussion of the different semantic analyses that have been suggested for wh-interrogatives falls largely beyond the constraints of the present work. Therefore I will concentrate only on how my conclusions about wh-words can be applied to a very popular account for the semantic contribution of wh-INTs, namely the one in Karttunen (1977). I will just assume this proposal, without discussing its pros and cons. In what follows, I will assume some details of Heim's (2001) extremely clear presentation of Karttunen's proposal.

According to Karttunen (1977), wh-INTs denote a set of propositions. More precisely, they denote the set of propositions that jointly constitute a complete and true answer to the wh-INT. For instance, *what Adam liked* in *Jie knew what Adam liked* denotes a set of propositions of the kind 'Adam liked Korean food', 'Adam liked Japanese movies', 'Adam liked Hungarian music', etc. A concise more formal way to express this is given in (1) (p is a variable over propositions).

(1) $[_{\text{wh-INT}}$ what Adam liked$] \rightarrow \lambda p \exists x[\ ^{\vee}p \wedge p = \ ^{\wedge}[\text{inanimate}'(x) \wedge \text{like}'(x)(a)]]$

According to (1), the wh-INT *what Adam liked* translates into a logical form that denotes a set of propositions that are true in the actual world and that are equivalent to the

proposition that there is an inanimate entity that Adam liked. Kartunnen's original proposal actually ignores the restrictions that distinguish *who*, *what*, *where*, *when*, and *how*. In (1), I have introduced the *inanimate* restriction to distinguish *what* from the other wh-words, similarly to what I have done from Chapter 2 on.

As made explicit in (1), Karttunen's analysis assumes wh-phrases in wh-INTs to behave semantically like existentially quantified expressions. On the other hand, we saw in the previous chapters that wh-phrases in FRs cannot be assigned any quantificational force. Karttunen would assign the phrasal wh-word *what* a logical form like the one in (2), while the one we assigned to *what* in Chapter 2 is repeated in (3). The only crucial difference between the two formulas is in the boxed elements: an existential quantifier in Karttunen's (2), a λ-abstractor in mine (3). This is true for all the other phrasal wh-words that can occur both in wh-INTs and FRs.

(2) *According to Karttunen*
    what → λX$_{<e,t>}$ $\boxed{\exists}$x$_{<e>}$[inanimate′(x) ∧ X(x)]

(3) *My proposal*
    what → λX$_{<e,t>}$ $\boxed{\lambda}$x$_{<e>}$[inanimate′(x) ∧ X(x)]

If we want to maintain Karttunen's semantics for interrogatives (i.e. interrogatives as set-of-proposition-denoting expressions) without assuming that wh-words in wh-INTs have a different lexical meaning from wh-words in FRs, the existential quantification over the variable introduced by the wh-trace in (1) can no longer be triggered by the lexical meaning of wh-words, as in (2). In order to deal with this problem, I will make use of two further covert elements: ∃ and ?. They are just my own version of two stipulations that are already in Karttunen's proposal, as will become clear soon. I will

illustrate my proposal with the sample derivation in (4)-(5). Comments follow.

(4) a. Jie knew what Adam liked.

b.
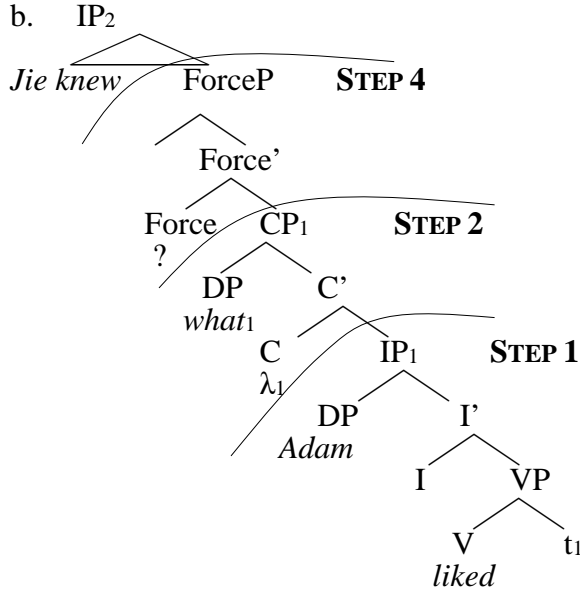
(5) *Logical form of the wh-INT in (4)*

1. *liked* → $\lambda x \lambda y[\text{like}'(x)(y)]$

2. $t_1 \to x_1$

3. *Adam* → a

4. *what$_1$* → $\lambda X \lambda x_1[\text{inanimate}'(x_1) \wedge X(x_1)]$

5. [$_{VP}$ *liked* t_1]→$\lambda x \lambda y[\text{like}'(x)(y)](x_1) \equiv \lambda y[\text{like}'(x_1)(y)]$

6. [$_{I'}$ *liked* t_1] → $\lambda y[\text{like}'(x_1)(y)]$

7. [$_{IP}$ *Adam like* t_1] → $\lambda y[\text{like}'(x_1)(y)](a) \equiv \text{like}'(x_1)(a)$

8. [$_{C'}$ λ_1 *Adam liked* t_1] → $\lambda x_1[\text{like}'(x_1)(a)]$

9. [$_{CP1}$ *what$_1$ Adam liked* t_1] → $\lambda X \lambda x_1[\text{inanimate}'(x_1) \wedge X(x_1)] (\lambda x_1[\text{like}'(x_1)(a)])$
    $\equiv \lambda x_1[\text{inanimate}'(x_1) \wedge \lambda x_1[\text{like}'(x_1)(a)](x_1)] \equiv \lambda x_1[\text{inanimate}'(x_1) \wedge \text{like}'(x_1)(a)]$

10. ? → $\lambda P \lambda p \exists x[\,^\vee p \wedge p = \,^\wedge P(x)]$

11. [$_{ForceP}$? *what Adam liked* t_1] → $\lambda P \lambda p \exists x[\,^\vee p \wedge p = \,^\wedge P(x)] (\lambda x_1 [\text{inanimate}'(x) \wedge \text{like}'(x)(a)])$
    $\equiv \lambda p \exists x [\,^\vee p \wedge p = \,^\wedge [\text{inanimate}'(x) \wedge \text{like}'(x)(a)]]$

I divided the semantic derivation in (4)-(5) above into three steps. Step 1 and Step 2 are the same as the ones of the identical FR in Chapter 2 §2.4.2.2.1.2. Therefore, I will not comment on them and I will just refer the reader to the discussion in Chapter 2. Here I

will concentrate on Step 3.

STEP 3: ForceP level. I assume a covert element **?** to be the head of a **Force Phrase** (**ForceP**). Its semantic contribution is that of a function that applies to a property, existentially closes it and returns a <u>set</u> of <u>true</u> propositions (cf. (5.10)). It is easy to see that the result is the same as Karttunen's analysis: a wh-INT ends up denoting a set of propositions (cf. (5.11) and (1)).

This analysis may look stipulative and not very elegant. Nevertheless, it uses exactly the same ingredients as Karttunen's and it has at least one empirical advantage. In my analysis, it is ? and not the wh-phrase that triggers existential closure. This move has the advantage that we are no longer forced to conclude that wh-words in wh-INTs and FRs have different meaning.

Unlike FRs, wh-INTs can contain more than one wh-phrase. Therefore, Step 2 can be reiterated. In other words, a wh-INT will have as many CP_1s as wh-phrases. Also, a more general definition of ? is needed, like the one in ??, such that ? applies to and existentially closes as many properties as its wh-phrases.

(6) ? $\rightarrow \lambda P_1 \lambda P_{2\ldots} \lambda P_n \lambda p \exists x_1 \exists x_2 \ldots \exists x_n [\ ^\vee p \wedge p = {^\wedge}P(x_1, x_2 \ldots x_n)]$

In conclusion, my implementation of Karttunen's proposal is very close to the original one, but it has the advantage that assumes a semantic contribution for wh-words that can account for both wh-INTs and FRs.

CONCLUSION

What is the semantic contribution of phrasal wh-words like *who*, *what*, *where*, *when*, *how*, and their equivalents across languages? The present work was an attempt to answer this not-so-unusual question in an unusual way. What we concluded by looking at the semantic behavior of FRs cross-linguistically is that the semantic contribution of wh-words is the one of restricting a set: they apply to a set and return one of its subsets. The set that wh-words apply to always results from λ-abstracting over the variable that is introduced in the logical representation by the wh-trace. For instance, *what* in *Jie ate* [*what Adam liked* t] applies to the set of entities that Adam liked and returns the subset of inanimate entities that Adam liked. The set of things that Adam liked results from λ-abstracting over the variable introduced by the wh-trace t.

Three main conclusions were reached in the present work. First, FRs are cross-linguistically attested and their semantic behavior is very similar across languages. Therefore, by studying them, we can reliably draw conclusions about some general aspects of language, in particular wh-words. Second, the semantic contribution of phrasal wh-words like *who*, *what*, *where*, *when*, *how*, and their equivalents across languages is the one of restricting a set. Third, maximality can be used by languages as a default strategy to overcome type-mismatch and does not need to be incorporated into the meaning of an overt lexical element. I suggested that there is a principled reason why maximality is made used of rather then any other strategy, for instance quantification: it is the best information-preserving strategy from going to a set of entities to an entity.

Appendix

FREE RELATIVES: CROSSLINGUISTIC DATA

INDOEUROPEAN : ROMANCE

Catalan

(1) *who*

    a. Digue'm [wh-INT **qui/ *que** treballa dur].
       tell-me   who/* that_COMPL works hard
       'Tell me who works hard.'

    b. Admiro [FR **qui/*que** treballa dur].
       admire.1SG who/*that_COMPL works hard
       'I admire those who work hard.'

    c. Admiro   la gent [HR ***qui/ que** treballa dur]
       admire.1SG the people *who/that_COMPL work.3PL hard
       'I admire people who work hard.'

(2) *what*

    a. Digue'm [wh-INT **què /*que** has   cuinat].[1]
       tell-me   what/*that_COMPL have.2SG cooked
       'Tell me what you cooked.'

    b. He   tastat [FR ***què/*que** has   cuinat].[2]
       have.1SG tasted   *what/*that_COMPL have.2SG cooked

    c. He   tastat el menjar [***què/ que** has cuinat].
       have.1SG tasted the food   *what/that_COMPL have.2SG cooked
       'I tasted the food you cooked.'

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[1] The spelling difference between *què* and *que* corresponds to an actual phonetic difference: [kɛ] 'què' vs. [kə] 'que'.

[2] Catalan does not have FRs introduced by *què* 'what'. The English sentence *I tasted what you cooked* would be translated as follows:

(3) *where*

a. No sé [wh-INT **on**   van   néixer els meus pares].
   not know.1SG where AUX.3PL be-born the my   parents
   'I don't know where my parents were born.'

b. Vaig   néixer [FR **on**   els meus pares van   néixer].
   AUX.1SG be-born   where the my   parents AUX.3PL be-born
   'I was born where my parents were born.'

c. Vaig   néixer a la ciutat [HR **on**   els meus pares van   néixer].
   AUX.1SG be-born in the town   where the my   parents AUX.3PL be-born
   'I was born in the town where my parents were born.'

(4) *when*

a. T'he   preguntat [wh-INT **quan/*en què**   va   arribar la Maria].
   to-you-have.1SG asked   when/*in that_COMPL AUX.3SG arrive the Maria
   'I asked you when Maria arrived.'

b. Me'n   vaig   anar [FR **quan/*en què**   la Maria va   arribar].
   me-CL AUX.1SG go   when/*in that_COMPL the Maria AUX.3SG arrive
   'I left when Maria arrived.'

c. Me'n   vaig   anar en el moment [HR ?***quan/en què**   la Maria va   arribar].
   me-CL AUX.1SG go   in the moment   ?*when/in that_COMPL the Maria AUX.3SG arrive
   'I left at the moment when Maria arrived.'

(i) He   tastat això   /el [HR que has   cuinat].
   have.1S tasted this.DEM.N /the.M.S that have.2SG cooked
    'I tasted what you cooked.'

The bracketed string in (i) is not a FR according to our definition, since it is not introduced by a wh-word nor can it be replaced with a DP or PP.

(5) *how*

    a. Digue'm [_wh-INT_ **com/*que**   ho vas   fer].[3]
        tell-me   how/*that_COMPL_ it AUX.2SG do
        'Tell me how you did it.'

    b. Ho vaig   fer [_FR_ **com/*que**   ho vas   fer tu].
        it   AUX.1SG do   how/*that_COMPL_ it AUX.2SG do you
        'I did it how you did it.'

    c. Ho vaig   fer de la mateixa manera [_HR_ **?com/que**   ho vas   fer tu].
        it   AUX.1SG do of the same   way   ?how/that_COMPL_ it AUX.2SG do you
        'I did it in the (same) way you did it.'

(6) *why*

    a. Digue'm [_wh-INT_ **perquè** ho vas   fer].
        tell-me   why   it AUX.2SG do
        'Tell me why you did it.'

    b. Ho vaig   fer [_?_ **perquè** ho vas   fer tu].
        it AUX.1SG do why   it AUX.2SG do you
        'I did it because you did it.'
        (This can never mean: 'I did it for the same reason you did it.')

    c. Ho vaig   fer pel   mateix motiu [_HR_ **perquè** ho vas   fer tu].
        it   AUX.1SG do for-the same   reason   why   it AUX.2SG do you
        'I did it for the same reason you did it.'

Catalan	*who*	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√	*	√	√	√	*
HRs	*	*	√	*	?	√

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[3] The * on *que* in (5a) only means that *Digue'm que ho vas fer* can never mean 'Tell me how you did it.' It is a perfectly acceptable sentence in Catalan with the meaning 'Tell me that you did it'.

French

(7) *who*

    a.   Dis moi [wh-INT **qui**   travaille dur].
           tell me   who works   hard
           'Tell me who works hard.'

    b.(?)J'admire [FR **qui**   travaille dur].
           I-admire   who works   hard
           'I admire those who work hard.'

    c.   J'admire les gens [HR   **qui** travaillent dur].
           I-admire the people   who work.3P hard
           'I admire (the) people who work hard.'

(8) *what*

    a.   Dis moi [wh-INT**ce** **que**/   *****que** tu as   cuit].
           tell me   that COMP/ *COMP you have.2S cooked
           'Tell me what you cooked.'

    b.   J'ai   goute [FR **ce** **que**/   *****que** tu as   cuit].
           I-have tasted   that COMP/ *COMP you have.2S cooked
           'I tasted what you cooked.'

    c.   J'ai   goute la   nourriture [HR **ce** **que**/   *****que** tu as   cuit].
           I-have tasted the food   that COMP/ *COMP you have.2S cooked
           'I tasted the food you cooked.'

(9) *where*

    a.   Je ne sais   pas [wh-INT **où**   mes parents sont nés].
           I   not know not   where my parents are born
           'I don't know where my parents were born.'

    b.   Je suis né [FR **où**   mes parents sont nés].
           I am born where my parents are born
           'I was born where my parents are born.'

    c.   Je suis né   dans la   ville [HR **où**   mes parents sont nés].
           I am born in   the town   where my parents are born
           'I was born in the same town where my parents were born.'

(10)   *when*

   a.   Je t'ai   demandé [wh-INT **quand**/ ****où**   Marie est   arrivée].
        I   you.CL.DAT-have.1S asked   when/ *REL Marie is   arrived
        'I asked you when Marie arrived.'

   b.   Je suis   parti [FR **quand**/***où**   Marie est   arrivée].
        I   am   left   when/ *REL Marie is   arrived
        'I left when Marie arrived.'

   c.   Je suis parti au   moment [HR ***quand**/ **où**   Marie est   arrivée].
        I   am   left at-the moment   *when/ REL Marie is   arrived
        'I left at the moment Marie arrived.'

(11)   *how*

   a.   Dis moi [wh-INT **comment**/ ***comme** / ***dont**/***que**   tu   l'as   fait].
        tell me   howINT/   *howFR/   *REL/ *COMP you it.CL-have.2S done
        'Tell me how you did it.'

   b.   Je l'ai fait   [FR ***comment**/ **comme** / ***dont**/***que**   tu   l'as   fait].
        I   it.CL-have.1S done *howINT/   howFR/   *REL/ *COMP you it.CL-have.2S done
        'I did it how you did it.'

   c.   Je l'ai   fait de la   facon [FR ***comment**/***comme** / **dont**/ **que**   tu
        I   it.CL-have.1S done of the   way   *howINT/ *howFR/   REL/ COMP you
        l'as   fait].
        it.CL-have.2S done
        'I did it in the (same) way you did it.'

(12)   *why*

   a.   Dis moi [wh-INT **pourquoi** tu   l'as   fait].
        Tell me   why   you it.CL-have.2S done
        'Tell me why you did it.'

   b.   * Je l'ai fait [FR **pourquoi** tu   l'as   fait].
        I it.CL have.1S   why   you it.CL-have.2S done
        ('I did it why you did it.')

   c.   * Je l'ai fait pour la   raison [HR **pourquoi** tu   l'as   fait].
        I it.CL have.1S the reason   why   you it.CL-have.2S done
        ('I did it for the same reason why you did it.')

French	*who*	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	?	√	√	√	*	*
HRs	√	√	√	*	*	*

Spanish

General comments. Spanish distinguishes orthographically between wh-words in wh-INTs and FRs.

(13) *who*

    a. Pregunté [$_{wh\text{-}INT}$ **quién /*quien /*que**   trabaja duro].
       asked.1S   who$_{INT}$/*who$_{FR}$/*COMP works hard.
       'I asked who works hard.'

    b. Admiro   a [$_{FR}$ ***quién** /**quien**/***que**   trabaja duro].
       admire.1S to   *who$_{INT}$/who$_{FR}$/*COMP works hard
       'I admire those who work hard.'

    c. Admiro   (a) la gente [$_{HR}$ ***quién** /***quien** /**que**^{4} trabaja   duro].
       admire.1s (to) the people   *who$_{INT}$/who$_{FR}$/COMP work.3P hard.
       'I admire people who work hard.'

(14) *what*

    a. Pregunté [$_{wh\text{-}INT}$ **qué /*que /lo   que** ^{5} cocinaste].
       asked.1S   what/*COMP/the.N.S COMP cooked.2S
       'I asked what you cooked.'

    b. Comí [***qué** /***que** /**lo que**   cocinaste].^{6}
       ate.1S *what**/***COMP/the.N.S COMP cooked.2S
       'I ate what you cooked.'

    c. Comí la comida [$_{HR}$ ***qué** /**que** /***lo**   **que**   cocinaste].
       ate.1S the food   *what/COMP/*the.N.S COMP cooked.2S
       'I ate the food you cooked.'

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^{4} I consider the complementizer *que* and the *que* in headed relative clauses to be the same element and I gloss it as COMP, following what Kayne (1976) and Cinque (1981) have argued for French and Italian, respectively.

^{5} I consider *que* in the DET+*que* constructions to be a complementizer, following Plann (1980: Chapter 1).

^{6} The bracketed clause with *lo que* in (14b), the only acceptable option, is not a FR according to our definition, since it does not have a wh-word.

(15) *where*

    a. No sé   [wh-INT **dónde** /***donde** nacieron   mis padres].
       not know.1S   whereINT/*whereFR were-born.3P my parents
       'I don't know where my parents where born.'

    b. Nací   [FR ***dónde** /**donde** nacieron   mis padres].
       was-born.1S *whereINT/whereRP were-born.3P my parents
       'I was born where my parents were born.'

    c. Nací   en la misma ciudad [HR ***dónde** /**donde** nacieron   mis padres].
       was-born.1S in the same   town   *whereINT/whereFR were-born.3P my parents
       'I was born in the same town where my parents where born.'

(16) *when*

    a. Te pregunté [wh-INT **cuándo/*en que**   llegaba   María].
       to-you asked.1S   whenINT/*in COMP/RP arrived.3S Maria
       'I asked you when Maria arrived.'

    a'. Te pregunté [FR **cuando** llegaba María].
       to-you asked.1S whenFR arrived.3S Maria
       'I asked you a question when/at the time that Maria arrived.'

    b. Me   fui [FR ***cuándo**/**cuando/*en que**   María llegó].
       CL.REFL.1S left.1S *whenINT/whenFR/*in COMP/RP Maria arrived.3S
       'I left when Maria arrived.'

    c. Me   fui en el momento [HR ***cuándo**/ ?***cuando**/**en que**[7]   María llegó].
       CL.REFL.1S left.1S in the moment   *whenINT/ ?*whenFR /in COMP/RP Maria arrived.3S
       'I left at the (same) time that Maria arrived.'

(17) *how*

    a. Dime [wh-INT **cómo** /***como** lo   hiciste].
       tell-me   howINT/*howFR it.CL did.2S
       'Tell me how you did it.'

    b. Lo   hice [FR ***cómo** /**como** tú lo   hiciste].
       it.CL did.1S   *howINT/howFR you it.CL did.2S
       'I did it how you did it.'

    c. Lo hice   de la misma manera [HR ***cómo** / ?**como** /**en que**   tú lo   hiciste].
       it.CL did.1S of the same   way   *howINT/ ?howFR /in COMP/RP you it.CL did.2S
       'I did it in the same way you did it.'

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[7] Here and in the following acceptable instances of *en que*, I cannot determine if *que* is a complementizer or a relative pronoun.

(18) *why*

a. Pregunté [wh-INT **por qué** /*por lo   que /*que** lo   hiciste].
    asked.1S   for what/*for the.N.S COMP/*COMP it.CL did.2S
    'Tell me why you did it.'

b. Lo   hice   [*por qué/por lo   que /*que** tú lo   hiciste].[8]
    it.CL did.1S *for what/for   the.N.S COMP/*COMP you it.CL did.2S
    'I did it for the same reason why you did it.'

c. Lo   hice   por la misma razón [HR *por qué/*por lo   que /que** tú   lo   hiciste].
    it.CL did.1S for the same   reason   *for what/*for   the.N.S COMP/COMP you it.CL did.2S
    'I did for the same reason why you did it.'

Spanish	*who*	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√	*	√	√	√	*
HRs	*	*	√	?*	?	*

INDOEUROPEAN: GERMANIC

German

General comments. German has two series of elements that introduce HRs. One is homophonous with the definite article *die* 'the', the other with the wh-determiner *welche* (*welche/r/s/n/m*) 'which'. All the examples of HRs below are introduced by an element of the *die* series, which has been glossed "RP". Unless otherwise noted, the corresponding element of the *welche* series can be used as well.

The *die* series can never introduce FRs or wh-INTs. The *welche* series can never introduce FRs, while it can introduce wh-INTs only when the wh-word is combined with an NP or understood elliptically.[9]

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[8] Not a FR for the same reason why (14b) is not (cf. fn. 6).

[9] Some examples to illustrate this point:

(19) *who*

    a. Sag mir, [wh-INT **wen**   du   magst].

         say me   who.ACC you like

         'Tell me who you like.'

    b. [FR **Wen**   du   magst] mag ich nicht.

            who.ACC you like   like   I   not

         'I don't like the people you like.'

    c. Ich mag die Leute   nicht, [HR ***wen/**   **die**   du magst].

         I   like   the people not   *who.ACC/RP.ACC.P   you like

         'I don't like the people you like'.

(20) *what*

    a. Sag mir, [wh-INT **was** du gekocht hast].

         Tell me what you cooked have

         'Tell me what you cooked.'

    b. Ich habe probiert, [FR **was**   du   gekocht hast].[10]

         I   have tried,   what you cooked   have.

         'I tasted what you cooked.'

    c. Ich habe das Essen, [HR **?was/das**   du   gekocht hast, probiert].

         I   have the food   ?what/RP.ACC.N.S you cooked   have, tried

         'I tasted the food you cooked.'

 (i) Sag mir welcher ??(Mann) hart arbeitet.

     'Tell me which ??(man) works hard.'

 (ii) Finde heraus, wo die Männer sind, und welcher ___ hart arbeitet.

     'Find out where the men are and which____hard works.'

[10] One of my consultants has a slight preference for the FR to be preposed in a contest like this with a roughly contrastive meaning, presumably because NP extraposition is banned his dialect:

(i) [FR **Was** du gekocht hast], habe ich probiert.

(21) *where*

    a. Ich weiss nicht, [_{wh-INT} **wo**   meine Eltern geboren sind].

       I   don't know   where my parents born   are

       'I don't know where my parents were born.'

    b. Ich bin geboren, [_{FR} **wo**   meine Eltern geboren sind].

       I   am born   where my parents born   are

       'I was born where my parents were born.'

    c. Ich bin in derselben Stadt geboren, [_{HR} ?**wo**[11]/ **in der**   meine Eltern geboren sind].

       I   am in the-same city   born   where/ in RP.DAT.F.S my parents born   are

       'I was born in the town where my parents were born.'

(22) *when*

    a. Ich habe dich   gefragt, [_{wh-INT} **wann** Maria angekommen ist].

       I   have you.ACC asked,   when Maria arrived   is

       'I asked you **when** Maria arrived.'

    b. Ich bin gegangen, [_{wh-INT} ***wann**/**als**[12]   Maria angekommen ist].

       I   am left   *when/when.CONJ Maria arrived   is

       'I left when Maria arrived.'

    c. Ich bin in dem Moment gegangen, [_{HR} ***wann**/?**als**   /**in dem** Maria angekommen ist].

       I   am in the moment left   *when/when.CONJ/in RP.DAT Maria arrived   is

       'I left at the moment when Maria arrived.'

(23) *how*

    a. Sag mir,   [_{wh-INT} **wie** du es gemacht hast].

       say me.DAT   how you it made have

       'Tell me how you did it.'

    b. Ich habe es (so) gemacht, [_{FR} **wie**   du (es getan hast)].[13]

       I   have it   so made   how/as you (it made have)

       'I did it how you did it.'

    c. Ich habe es auf dieselbe (Art und) Weise gemacht, [_{HR} **wie**   du (es getan hast)].

       I   have it on the-same (kind and) way   made   how/as you (it made have)

       I did it in the same way you did it.'

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[11] The variant of (21c) with *wo* is colloquial or mildly deviant for both my consultants.

[12] *Als* 'when' is a subordinating temporal conjunction.

[13] (i) Er singt, wie er tanzt: schrecklich!

    he sings how he dances: horribly

    'He sings as he dances: horribly!'

(24) *why*

    a. Sag mir, [_{wh-INT} **warum** /**weswegen**   du es getan hast].

       say me   why/   because-of-what you it done have

       'Tell me why you did it.'

    b. Ich habe es getan [_{FR} ***warum/*weswegen**   du es getan hast].

       I   have it done   *why/   *because-of-what you it done have

    c. Ich habe es aus demselben Grund getan, %**warum**[14]/***weswegen**/   **aus**   **dem**

       I have   it out-of the-same reason done, %why/   *because-of-what/ out-of RP.DAT

       du es getan hast].

       you it done have

       'I did it for the same reason why you did it.'

German	*who*	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√	√	√	*	√	*
HRs	*	?	√	*	√	%

Dutch

General comments. Like German, Dutch uses wh-words to form wh-INTs and FRs, and a

morphologically unrelated series, which look like demonstratives, to form HRs.

(25) *who*

    a. Vertel me [_{wh-INT} **wie** er   hard werkt].[15]

       tell   me   who there hard works

       'Tell me who works hard.'

    b. Ik bewonder [_{FR} **wie** hard werkt].

       I admire   who hard works

       'I admire who works hard.

    c. Ik bewonder (de) mensen [_{HR} ***wie**/**die** hard werken].

       I admire   (the) people   who/RP hard work

       'I admire (the) people who work hard.'

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[14] The variant of (24c) with *warum* is mildly deviant for one of my consultant and (almost) unacceptable for the other.

[15] *Wie* 'who' in (25a) triggers the use of the existential *er* 'there' [Mark de Vries p.c.].

(26) *what*

    a. Vertel me [_wh-INT_ **wat** jij gekookt hebt].
       tell me   what you cooked have.
       'Tell me what you cooked.'

    b. Ik proefde [_FR_ **wat** jij gekookt had].
       I tasted   what you cooked had
       'I tasted what you cooked.'

    c. Ik proefde het eten [_HR_ %**wat**[16]/**dat** jij gekookt had].
       I tasted   the food   %what/RP you cooked had
       'I tasted the food you cooked.'

(27) *where*

    a. Ik weet niet [_wh-INT_ **waar** mijn ouders geboren zijn].
       I know not   where my parents born   are
       'I don't know where my parents were born.'

    b. Ik ben geboren [_FR_ **waar** mijn ouders geboren zijn].
       I am born   where my parents born   are
       'I was born where my parents were born.'

    c. Ik ben geboren in de stad [_HR_ **waar** mijn ouders (ook) geboren zijn].
       I am born   in the city   where my parents (too) born   are
       'I was born in the town where my parents where born.'

(28) *when*

    a. Ik vroeg je [_wh-INT_ **wanneer**/*****toen** Maria aankwam].
       I asked you   when /*when Maria arrived
       'I asked you when Maria arrived.'

    b. Ik vertrok [_??_ *****wanneer**/**toen** Maria aankwam].
       I left   *when/ when Maria arrived
       'I left when Maria arrived.'

    b'. Ik vertrek [_FR_ **wanneer/*****toen** Maria aankomt].
       I (will)-leave when /*when Maria arrives
       'I will leave when Maria arrives.

    c. Ik vertrok/vertrek op het moment [_HR_ *****wanneer**/*****toen/** **dat** Maria aankwam/aankomt].
       I left/   (will)-leave at the moment *when/   *when/that.COMP Maria arrived/arrives
       'I left at the moment when Maria arrived.'

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[16] *Wat* is unacceptable in HRs in standard Dutch. However, there is a language change going on and for many speakers *wat* is acceptable in this context [Mark de Vries p.c.].

(29) *how*

    a. Vertel me [wh-INT **hoe** jij   het gedaan hebt].
       tell   me   how you it done   have
       'Tell me how you did it.'

    b. Ik heb het gedaan [wh-INT ?**hoe/zoals** jij   het gedaan hebt].[17]
       I have it   done   ?how/as   you it   done have
       'I did it how you did it.'

    c. Ik heb het gedaan op de manier [HR **hoe/zoals** jij het (ook) gedaan hebt].
       I have it   done in the way   how/as   you it (too) done   have
       'I did it in the same way you did it.'

(30) *why*

    a. Vertel me [wh-INT **waarom** jij het gedaan hebt].
       tell   me   why   you it done   have
       'Tell me why you did it.'

    b. Ik heb het gedaan [FR *****waarom/omdat** jij het gedaan hebt].
       I have it   done   *why/   because you it done   have
       'I did it because you did it.'

    c. Ik heb het gedaan om de reden [HR ?**waarom/*omdat** jij het (ook) gedaan hebt].
       I have it   done   for the reason   ?why/   *because you it (too) done   have
       'I did it for the (same) reason you did it.'

Dutch	*who*	*what*	*where*	*when*	*how*	*why*
Wh-INTs	√	√	√	√	√	√
FRs	√	√	√	*/√	?	*
HRs	*	%	√	*	√	?

    Specific comments. **When**. (28b) show that a FR with *wanneer* 'when' is unacceptable with a perfect tense, but only works in a future/conditional context (28b') for some reason. *Toen* exhibit the opposite pattern tense ((28b) vs. tense (28b')). The bracketed string with *toen* in (28b) is not a FR according our definition though, since it is not

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[17]But the following FR with *hoe* is judged perfectly acceptable by the same speaker:

    (i) Ik heb het gedaan [FR **hoe** jij het wilde].
         I have it done   how you it wanted
         'I did it how you wanted.'

introduced by a wh-word nor is it clear if it has an adjunct gap. I am not sure if the brackted string with *toen* in (28b) constitutes an adverbial free relative, or just an adverbial clause. Smits (1988: 371-2) gives the non-conditional example of a HR with *wanneer* in (31). One of my consultants does not like this example, but he still finds it better than (28c).

(31) De dagen wanneer het regent zijn sombere dagen.
　　'The days when it rains are gloomy days.'

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