

# Free relatives\*

Radek Šimík

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## 1 What are free relatives?

Free relative clauses or simply free relatives (FRs) are descriptively defined as wh-clauses which, despite their clausal nature, function as nominal, prepositional, adverbial, or adjectival phrases in their host clauses (Bresnan & Grimshaw 1978; Caponigro 2003; a.o.). The nominal and adverbial nature of FRs is illustrated by the paraphrases in (1) through (3).

- (1) a. [FR What Adam presented] sounded plausible.  
b. [NP The proposal(s) that Adam presented] sounded plausible.

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- (2) a. The director will nominate [FR whichever student the teacher selected].  
 b. The director will nominate [NP the student that the teacher selected].
- (3) a. You can't smoke [FR where the kids are playing].  
 b. You can't smoke [PP in the place(s) where the kids are playing].

FRs are introduced by a wh-phrase—either a wh-pronoun (*what, where, etc.*) or a complex wh-phrase, i.e., a wh-determiner plus an NP (*which(ever) student*). It is now commonly assumed that the wh-phrase reaches its clause-initial position (SpecCP) by wh-movement (so called COMP Hypothesis, initiated by Groos & van Riemsdijk 1981), which gives rise to an operator-variable dependency at the semantic interface (see section 4 for more on the compositional aspects of FRs).

- (4) [TP [CP What<sub>i</sub> [TP Adam presented t<sub>i</sub>]] sounded plausible].

For a comprehensive syntactic description and the various syntactic analyses of free relatives, see van Riemsdijk (2017).

### 1.1 Plain and ever wh-words and free relatives

It is a cross-linguistically common property of FRs that they employ two classes of wh-words—*plain wh-words* and *ever wh-words*, which in turn correspond to two classes of FRs—*plain FRs* and *ever FRs*, illustrated (5).

- (5) I will arrive when / whenever you call.

Plain wh-words in FRs are often considered to be morphologically identical to interrogative wh-words, a belief that occasionally feeds into semantic analyses of FRs (see esp. Chierchia & Caponigro 2013 and section 4.2 of the present paper). While this holds for English, it is misleading for many other languages, where wh-words in FRs are morphologically identical to wh-words used in so called *light headed relatives (LHRs)*, which are relative clauses headed by pronouns (Citko 2004). Wh-words in LHRs are, in turn, possibly identical to but often *derived from* interrogative wh-words. These two options are illustrated below. German represents the type where the FR and LHR wh-form is identical to interrogative wh-forms, (6). Slovenian, on the other hand, the type where wh-words in FRs and LHRs are morphologically derived from interrogative wh-words, by adding the affix *-r*, (7) (the “loss” of *-j* in *ka[j]r* is phonological in nature). Crucially, there seems to be no language where the form of wh-words in FRs is interrogative and where LHR uses a derived wh-paradigm (arguably a case of \*ABA; Bobaljik 2012).<sup>1</sup>

- (6) *German*
- a. **Wh-question**  
 Ich weiß, **was** Maria kochte.  
 I know what Maria cooked  
 ‘I know what Maria cooked.’
- b. **Free relative**  
 Ich aß, **was** Maria kochte.  
 I ate what Maria cooked  
 ‘I ate what Maria cooked.’

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<sup>1</sup>It is important to hold genuine LHRs apart from HRs headed by determiners with elided head NPs, arguably the analysis of the English *that which...* Clearly, not all languages have productive genuine LHRs.

- c. **Light headed relative**  
 Ich aß alles / etwas / das, **was** Maria kochte.  
 I ate everything something that what Maria cooked  
 ‘I ate everything / something / that thing that Maria cooked.’
- d. **Headed relative**  
 Ich aß das Essen, **das** Maria kochte.  
 I ate the meal which Maria cooked  
 ‘I ate the meal that Maria cooked.’

(7) *Slovenian*

- a. **Wh-question**  
 Vem, **kaj** je Maja skuhala.  
 know.1SG what AUX.3SG Maja cooked  
 ‘I know what Maja cooked.’
- b. **Free relative**  
 Pojedel sem, **kar** je Maja skuhala.  
 ate AUX.1SG what.REL AUX.3SG Maja cooked  
 ‘I ate what Maja cooked.’
- c. **Light-headed relative**  
 Pojedel sem vse / nekaj / tisto, **kar** je Maja skuhala.  
 ate AUX.1SG everything something that what.REL AUX Maja cooked  
 ‘I ate everything / something / that thing that Maria cooked.’
- d. **Headed relative**  
 Pojedel sem obrok, **katerega** je Maja skuhala.  
 ate AUX.1SG meal which AUX.3SG Maja cooked  
 ‘I ate the/a meal that Maja cooked.’

Table 1 provides a selection of crosslinguistic examples of wh-words (‘where’) in their interrogative, light headed relative, and plain/ever free relative function. The table shows that wh-words in FRs are morphologically based on LHR wh-words, which in turn are based on (and possibly identical to) interrogative wh-words. The morpheme deriving plain wh-words of FRs ( $\approx$  wh-words in LHRs) from interrogative wh-words is sometimes morphologically/diachronically related to the definite article (Greek, Hungarian, Bulgarian), other times to a complementizer (Slovenian); see Rudin (2014) for discussion. The ever morpheme is morphologically/diachronically related to a variety of elements, such as universal quantifiers (English), exclusive particles (Hungarian), but also additive particles (German), or modal verbs (Spanish). In some languages, Bulgarian being an example, there is no dedicated ever morpheme and its semantic contribution is achieved by using the subjunctive mood instead.<sup>2</sup>

## 1.2 Definite-like vs. universal-like ever free relatives

Besides the directly observable distinction between plain and ever FRs, it has been noted as early as in Elliott (1971) that ever FRs seem to come in two major semantic types: *definite-like ever FRs* and *universal-like ever FRs*, corresponding to definite descriptions and universal quantifiers, respectively (data from Dayal 1995b, 1997).<sup>3</sup>

<sup>2</sup>The data in Table 1 were collected from native speakers and/or the following sources: Haspelmath & König (1998), Pancheva Izvorski (2000), Caponigro (2003), Giannakidou & Cheng (2006), Hladnik (2015), and Mitrović (2016).

<sup>3</sup>Various other terms that have been used for these two types of ever FRs, including definite or identity FRs (for definite-like ever FRs), and universal, quasi-universal, free choice, or conditional FRs (for universal-like FRs). I prefer definite-like and universal-like because they are theory-neutral.

	INTER	LHR	PLAIN FR	EVER FR
English	<i>where</i>	<i>(where)</i>	<i>where</i>	<i>wher-ever</i>
Spanish	<i>dónde</i>	<i>(donde)</i>	<i>donde</i>	<i>dondequiera que</i> + subj. mood
Czech	<i>kde</i>	<i>kde</i>	<i>kde</i>	<i>kde-koli</i>
German	<i>wo</i>	<i>wo</i>	<i>wo</i>	<i>wo (auch) immer</i>
Greek	<i>pou</i>	<i>o-pou</i>	<i>o-pou</i>	<i>o-pou-dhipote</i>
Hungarian	<i>hol</i>	<i>a-hol</i>	<i>a-hol</i>	<i>a-hol csak</i>
Bulgarian	<i>kăde</i>	<i>kăde-to</i>	<i>kăde-to</i>	<i>kăde-to</i> + subj. mood
Slovenian	<i>kje</i>	<i>kje-r</i>	<i>kje-r</i>	<i>kje-r-koli</i>

Table 1: Interrogative, light headed, and free relative wh-words

- (8) a. Whichever movie (it is that) is now playing at the Avon is making a lot of money.  
 ≈ **The movie** that is now playing at the Avon is making a lot of money.
- b. Whichever movie (\*it is that) plays at the Avon makes a lot of money.  
 ≈ **Every movie** that plays at the Avon makes a lot of money.

Definite-like ever FRs differ from universal-like FRs in that their wh-phrase can become a pivot of a cleft (*whichever movie it is that...*). In section 3, we will see that the definite- vs. universal-like behavior tends to correlate with another prominent classification of ever FRs, namely modal vs. non-modal ever FRs.

Not every language that has ever FRs allows for definite-like readings readily. This is illustrated in (9) for Greek, but comparable observations and claims have been made for other languages: von Stechow (2000) credits Anna Szabolcsi for the observation on Hungarian, Caponigro & Fălăuș (2018) discuss Italian and Romanian, and Šimík (to appear) investigates this issue for seven languages. A language with only definite-like ever FRs (i.e., lacking universal-like ever FRs) has not been documented.

- (9) *Greek* (Giannakidou & Cheng 2006:166/169)
- a. #Opjadhypote jineka ine i arxisindaktria aftou to periodikou, pire  
 which:EVER woman is the editor this:GEN the:GEN magazine:GEN got  
 ena vrvio xthes vradi.  
 a prize last night  
 Intended: ‘Whichever (≈ The) woman (who) is the editor of this magazine got a prize last night.’
- b. Opjosdhipote irthe sto parti, efxaristithike.  
 who:EVER came:3SG to.the party was.happy:3SG  
 ‘Whoever (≈ Everyone who) came to the party had a good time.’

At first blush, this state of affairs might support the view that ever FRs are genuinely ambiguous between definite descriptions and universal quantifiers, with some languages (e.g. English) affording both types and others (e.g. Greek) only the latter type. Later in this paper (in section 3.3), I will spend some time showing that this suspicion is not quite justified: at least in some languages that pattern with Greek, ever FRs are better analyzed as definite descriptions.<sup>4</sup> We will see that a more plausible reason for the unacceptability of (9-a) is the unavailability of so called modal readings of ever FRs.

<sup>4</sup>Cf. Caponigro & Fălăuș (2018), who argue that Italian and Romanian ever FRs—what they call *free choice FRs*—are quantifiers akin to English NPs with *any*.

### 1.3 Organization of the paper

The rest of the paper is divided into four sections. Section 2 introduces the basic semantic approaches to FRs. It focuses on the denotation of FRs as a whole, abstracting away from the way the meaning is compositionally derived, but respecting the division between plain FRs, definite-like ever FRs, and universal-like ever FRs. The discussion is based on English, which is by far the best studied language when it comes to FRs. Section 3 deals with the semantics of ever FRs and includes a discussion of recent crosslinguistic discoveries and generalizations. Section 4 sketches the various ways in which the meaning of FRs can be compositionally derived. Section 5 rounds up the discussion and highlights the most important open issues in the study of the semantics of FRs.

## 2 The basic semantics of free relatives

There has been a lively debate about the semantic contribution of FRs. Ever since the influential work of Pauline Jacobson (1988, 1995), the idea that FRs (both plain and ever FRs) correspond to definite descriptions such as *the man* has dominated. Currently, this view enjoys the status of a broad consensus.<sup>5</sup> There have been two major competitors. According to one, the formal distinction between plain and ever FRs corresponds to the semantic distinction between definite descriptions and universal quantifiers (such as *every man*).<sup>6</sup> The other competing approach holds that FRs correspond to indefinites (such as *a man*).<sup>7</sup> For ease of reference, I will call these views DEFINITE, UNIVERSAL (for ever FRs), and INDEFINITE, respectively. In what follows, I discuss them one by one and provide the major supporting evidence. I will pay attention to how the evidence applies to the three main types of FRs: plain FRs, definite-like ever FRs, and universal-like ever FRs. The results are summarized in section 2.4.

### 2.1 The definite analysis

Let us start with the fact, already noted in the introduction and illustrated in (10), that FRs can be paraphrased by corresponding definite descriptions without altering the truth-conditions of the sentence in which they are contained.

- (10) a. What(ever) Adam presented sounded plausible.  
b. The thing(s) Adam presented sounded plausible.

Jacobson (1988, 1995) proposed to take this fact at face value and construct an identical denotation for the expressions *what Adam presented* and *the thing(s) that Adam presented*. The denotation, following the Fregean tradition of analyzing definite descriptions (see Elbourne 2013), is given in (11-a).<sup>8,9</sup> (11-a-i) uses the  $\iota$  (iota) operator and (11-a-ii) uses the  $\sigma$  (sigma) operator (Link 1983). These metalinguistic operators are often used interchangeably in the literature on FRs, which is why I include them both here. Strictly speaking, however,  $\iota$  is only defined if

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<sup>5</sup>The most prominent works that rely on this view and often argue for it explicitly are Rullmann (1995); Dayal (1995a, 1997); Grosu (1996); Grosu & Landman (1998); von Stechow (2000); Pancheva Izvorski (2000); Caponigro (2003, 2004); Tredinnick (2005); Giannakidou & Cheng (2006); Hinterwimmer (2008a,b, 2013); Lauer (2009); Condoravdi (2015); Hirsch (2016).

<sup>6</sup>The proponents of this view include Bresnan & Grimshaw (1978); Cooper (1983); Larson (1987); Tredinnick (1995); Iatridou & Varlokosta (1996, 1998)

<sup>7</sup>The proponents of this view include Berman (1991, 1994); Wiltschko (1999); Sternefeld (2006). Wiltschko (1999), who gives by far the most comprehensive argumentation for this position, assumes that this analysis applies to both plain and ever FRs.

<sup>8</sup>Most authors dealing with FRs subscribe to the Fregean tradition, according to which definite descriptions (and hence FRs) are referential expressions denoting individuals (type  $e$ ) and expressing individual concepts (type  $\langle s, e \rangle$ ). See Article [Varieties of definites] for other possible analyses.

<sup>9</sup>The general semantic notation relies on the conventions introduced by Heim & Kratzer (1998).

there is exactly one thing that Adam presented; this corresponds to a singular sortal (*thing*) in the definite description. On the other hand,  $\sigma$  is defined if there is an entity that corresponds to everything (= the maximal entity) that Adam presented; this situation is compatible with both singular (*thing*) and plural (*things*) sortals in the definite description.<sup>10</sup> I follow Caponigro (2003) and Hinterwimmer (2008a) and stick to the more general  $\sigma$  operator in what follows. The truth-conditions of (10-a) under the DEFINITE analysis are captured in (11-b).

- (11) a.  $\llbracket \text{what(ever) / the thing Adam presented} \rrbracket =$
- (i)  $\iota x \text{ thing}'(x) \wedge \text{presented}'(x)(\text{Adam}')$   
(the single  $x$  such that  $x$  is a thing and Adam presented  $x$ )
- (ii)  $\sigma x \text{ thing}'(x) \wedge \text{presented}'(x)(\text{Adam}')$   
(the maximal  $x$  such that  $x$  is a thing and Adam presented  $x$ )
- b.  $\llbracket (10\text{-a}) \rrbracket = 1$  iff  
sounded plausible'( $\sigma x \text{ thing}'(x) \wedge \text{presented}'(x)(\text{Adam}')$ )  
(the thing(s) that Adam presented sounded plausible)

If Adam presented  $\mathbf{a}$ , then the set of things that Adam presented is  $\{\mathbf{a}\}$  (a singleton set) and (11-a), the denotation of the FR in (10), is  $\mathbf{a}$  (in which case both (11-a-i) and (11-a-ii) correctly capture the meaning). If Adam presented  $\mathbf{a}$ ,  $\mathbf{b}$ , and  $\mathbf{c}$ , then the set of things that Adam presented is  $\{\mathbf{a}, \mathbf{b}, \mathbf{c}, \mathbf{a}+\mathbf{b}, \mathbf{b}+\mathbf{c}, \mathbf{a}+\mathbf{b}+\mathbf{c}\}$  (i.e., everything that he presented— $\mathbf{a}+\mathbf{b}+\mathbf{c}$ —and all the subparts thereof) and (11-a), the denotation of (10), is  $\mathbf{a}+\mathbf{b}+\mathbf{c}$  (in which case only (11-a-ii) is appropriate because there is no single thing that Adam presented). See Caponigro (2003) for a more detailed and accessible presentation along the same lines.

The reader should bear in mind that the denotation (11-a-ii) carries a presupposition, i.e., it is only defined if there is a maximal entity (possibly without any subparts) that Adam presented. This presupposition follows from the definition of the  $\sigma$ -operator and is formulated semi-formally in (12) (where  $\leq$  is the part-of relation).<sup>11</sup>

- (12) For any  $P$ ,  $\sigma x P(x)$  is defined iff
- $\exists x [P(x) \wedge \forall y [P(y) \rightarrow y \leq x]]$   
(there is an element of  $P$  that contains all other  $P$  elements as its parts).
- If defined  $\sigma x P(x)$  is the maximal element in  $P$ .

## Empirical evidence

Let us now turn to the empirical evidence that backs the DEFINITE analysis of FRs.<sup>12</sup> One of the strongest arguments comes from the way FRs relate to **discourse anaphora**. FRs can be employed on both sides of the relation: (i) they can be antecedents for discourse anaphors, (13), and

<sup>10</sup>If Elbourne (2013) is right in analyzing all definite descriptions as individual concepts, i.e., functions from situations/worlds to individuals (type  $\langle s, e \rangle$ ), the same analysis should be applied to FRs as well: for all we know, Elbourne's arguments for definite descriptions extend to the domain of FRs (something that cannot be demonstrated here). The individual concept analysis of FRs was proposed for kind-denoting FRs by Hinterwimmer (2008a,b, 2013), who in turn follows Chierchia's (1998) approach to kind-denoting expressions, but has never been generalized along the lines of Elbourne (2013).

<sup>11</sup>Jacobson (1995) argued that the maximal element could even be the null set, trivially satisfying the presupposition. The example supporting this is in (i).

- (i) I read (exactly) what was on the reading list – namely nothing at all. (Jacobson 1995:473)

<sup>12</sup>I always try to reference the original source for the evidence discussed, which, of course, does not mean that it is not discussed elsewhere in the literature. Probably the most comprehensive overview of arguments for the DEFINITE position (often discussed in greater detail than here) can be found in Tredinnick (2005).

(ii) they can act as discourse anaphors themselves, (14). The argument applies straightforwardly only to plain FRs and definite-like ever FRs.

(13) John read [what(ever) Bill assigned]<sub>*i*</sub> – although I don’t remember what it<sub>*i*</sub> was, but I do know that it<sub>*i*</sub> was long and boring. (Jacobson 1995:454)

(14) Mary bought some thing<sub>*i*</sub>. [What(ever) she bought]<sub>*i*</sub> was expensive. (Dayal 1997:103)

The strength of this piece of evidence is that it (jointly) delimits the DEFINITE analysis from both the UNIVERSAL and INDEFINITE analyses: It is commonly assumed that universal quantifiers cannot directly act as discourse anaphors or their antecedents.<sup>13</sup> And while indefinite expressions make for perfect discourse anaphora antecedents, they completely fail as discourse anaphors.

The reference of FRs implies **maximality** (see, e.g., Rullmann 1995 or Grosu & Landman 1998 for discussion). For instance, the example in (15-a) only seems true if Mary read *all* the things that John recommended to her last Friday. Having read just *some* of the things does not seem sufficient for the truth of the sentence. The same effect is clearly traceable in the ever FR in (15-b), irrespective of it being a definite-like or a universal-like FR.

(15) a. Mary read what John recommended to her last Friday. (Hinterwimmer 2013)  
b. Mary read whatever (it was) John recommended to her last Friday.

The maximality argument is important in delimiting FRs from indefinites but cannot distinguish between the DEFINITE and the UNIVERSAL analyses.

The relative **scope of FRs and negation** constitutes another piece of evidence in favor of the DEFINITE analysis. If FRs are definites, they are expected not to exhibit narrow scope. This is clearly the case for plain FRs, as shown by example (16), which only affords the reading in which for everything Sue ordered (provided there was a plurality of it) it holds that I don’t like it. The infelicity of the *but...* continuation indicates the unavailability of the hypothetical narrow-scope reading of the FR, under which it is not the case that I like everything that Sue ordered (leaving it open that I like something).

(16) I don’t like what Sue ordered (#but I like most of it). (Dayal 1997:100)

This state of affairs rules out a UNIVERSAL analysis for plain FRs (something that has hardly ever been assumed, perhaps with the exception of Cooper 1983) but is in principle compatible with an INDEFINITE analysis on the condition that plain FRs are obligatorily narrow scoping with respect to negation (paraphrase: *I don’t like anything Sue ordered*).

The situation is more complex with ever FRs. Definite-like FRs seem to behave the same way as plain FRs, as shown in (17). Universal-like ever FRs, on the other hand, exhibit scope ambiguities, as first noticed by Dayal (1997). Tredinnick (2005) adds the observation that narrow scope is facilitated by placing stress on the ever morpheme.

(17) John doesn’t like whatever snacks it was that Sue ordered #but he likes most of them.

(18) I don’t like whatever Sue ordered (but I like most of it). (Dayal 1997:104)

The impossibility to **modify FRs by almost-type adverbs** is also often used as an argument in favor of the DEFINITE position (starting with Jacobson 1995). As before, the case is rather clear for plain FRs and definite-like ever FRs.<sup>14</sup>

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<sup>13</sup>Universal quantifiers can play these roles *indirectly*, by virtue of relevant systematic relations to corresponding definite descriptions: The universal quantifier *every N* can act as a discourse anaphor antecedent by virtue of its relation to the entity containing all the *N*-elements (expressible by the definite description *the Ns*), and it can apparently act as a discourse anaphor if its *N*-restriction is interpreted as an implicit partitive (corresponding to *every one of the Ns*).

<sup>14</sup>By the way, modification by *almost*-type adverbs sheds doubt on the INDEFINITE analysis as an explanation of scope facts like (16): if FRs interacting with negation were narrow-scoping indefinites, one would expect

- (19) \*{Almost/Nearly/Absolutely/Practically} what(ever it was) they asked him to do was easy.

The empirical situation is less clear for universal-like FRs. Jacobson (1995) considered all ever FRs incompatible with *almost*-type modifiers; see (20). On the other hand, Horn (2000) provided a number of naturally occurring grammatical examples and at least Tredinnick (2005) stated that modification of universal-like ever FRs by *almost*-type adverbs is not only grammatical but productive. One of her examples is in (21).

- (20) \*For years, I did almost whatever you told me to do. (Jacobson 1995:480)  
 (21) A: Thanks for your help. You did whatever I asked you to do. (Tredinnick 2005:36)  
 B: That's because almost whatever you asked me to do was easy.

It should be noted that modification by *almost*-type adverbs is not an ideal criterion to decide the case at hand because it does not reliably track universal quantification (noted, e.g., by Iatridou & Varlokosta 1998): there are universal quantifiers that resist the modification (*\*almost each N*) and non-universal quantifiers that allow it (*almost hundred N*).

The issue of **negative polarity item (NPI) licensing** has a similar history. Jacobson (1995) used the ungrammaticality (22) to argue for the DEFINITE position: restrictors of definite descriptions, as opposed to those of universal quantifiers, do not license NPIs (see Article [*Negative indefinites and negative concord*]). Jacobson's judgment was challenged by Tredinnick (2005:40), who considers (22) grammatical and provides further universal-like ever FRs, among them (23), in which NPIs are licensed.

- (22) \*I can read whatever (books) Bill ever read. (Jacobson 1995:480)  
 (23) John read whatever story his father ever sent him. (Tredinnick 2005:40)

At the same time, however, Tredinnick states that plain FRs and definite-like ever FRs fail to license NPIs, as expected under the DEFINITE analysis.

- (24) \*John read whatever story it was that his father ever sent him. (Tredinnick 2005:40)

The last argument I would like to mention is a distributional one: FRs are ungrammatical as pivots in existential sentences (noted, e.g., by Izvorski 1998). This indicates that FRs fall into the category of strong NPs (see Milsark 1974 and Article [*Strong and weak nominals*]) and therefore cannot be indefinite, but leaves it open whether they are definite or universal.<sup>15</sup>

- (25) \*There is what(ever) Mary brought on the table.

## 2.2 The universal analysis (of ever FRs)

The universal nature of ever FRs receives support from the fact that they (or at least some of them) can be paraphrased by corresponding universal quantifiers, as illustrated in (26).

- (26) a. Whatever Adam presented sounded plausible.  
 b. Everything Adam presented sounded plausible.

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modification by *almost* to be possible, contrary to facts.

- (i) \*I don't like almost what Sue ordered.  
 (cf. I don't like almost anything that Sue ordered.)

<sup>15</sup>An anonymous reviewer notes that FRs are grammatical as pivots of existential sentences if they are "licensed by an appropriate modal", giving the example in (i).

- (i) There will be what(ever) you order on your table by tomorrow.



The common denotation of the ever FR and the universal quantifier is given in (27-a) (standard for universal quantifiers ever since the seminal work of Richard Montague, see e.g. Montague 1973). The truth-conditions of (26-a) are provided in (27-b).<sup>16</sup>

- (27) a.  $\llbracket \text{whatever / everything Adam presented} \rrbracket =$   
 $\lambda P. \forall x [\text{presented}'(x)(\text{Adam}') \rightarrow P(x)]$   
 (the set of properties that all the things that Adam presented have)
- b.  $\llbracket (26\text{-a}) \rrbracket = 1$  iff  
 $\forall x [\text{presented}'(x)(\text{Adam}') \rightarrow \text{sounded}'(x)(\text{plausible}')] ]$   
 (all the things that Adam presented have the property of sounding plausible)

## Empirical evidence

The previous section made evident that a lot of the arguments for the DEFINITE approach are arguments against the UNIVERSAL approach. Moreover, it became clear that ever FRs exhibit a differential behavior with respect to the diagnostics used: definite-like ever FRs pattern with definites and universal-like ever FRs pattern with universals. Let us now look at further evidence in favor of the UNIVERSAL position for (universal-like) ever FRs.

Berman (1991) noticed that the denotation of plain FRs can covary with a variable bound by adverbial quantifiers—a phenomenon called a **quantificational variability** (QV) effect (see Article [*Nominal vs. adverbial quantification*]). The covarying reading of (28-a) can be paraphrased by (28-b). Tredinnick (1995) noticed that corresponding ever FRs do not give rise to the QV effect: (29-a) can only be paraphrased as (29-b); the covarying reading expressed by (29-c) is claimed to be missing.

- (28) a. Mary seldom likes who she meets. (Berman 1991:79)  
 b. Mary likes few (of the) people that she meets.
- (29) a. Whenever I go to the store, I mostly buy potatoes.  
 b. Whenever I go to the store, most of what I buy are potatoes.  
 c. Most of the occasions when I go to the store are such that I buy potatoes.  
 (Tredinnick 1995, via Dayal 1997:102)

Tredinnick (1995) understands this as an argument that ever FRs, as opposed to plain FRs, are quantificational and universal in particular. The idea is that FRs contribute a variable which is either bound by an adverbial quantifier, or by the ever morpheme, which corresponds to a quantificational (universal) determiner. (If neither of these is present, the iota/sigma operator does the job.) There are two problems with this reasoning, however. Firstly, it is incorrect to assume that universal quantifiers cannot exhibit QV effects (see Hinterwimmer 2008a for relevant discussion). Secondly, the above empirical generalization is very limited in scope. More particularly, Dayal (1997) claims that the lack of QV effects concerns ever FRs that denote in the domain of temporal intervals but it does not generalize to individual-denoting ever FRs. She provides the example in (30-a) and points out that its most natural reading is the one in (30-b) (compare with the pragmatically odd non-covarying reading in (30-c)).<sup>17</sup>

<sup>16</sup>In fact, an explicit denotation is rarely given by the proponents of the UNIVERSAL approach. For an exception see Cooper (1983:97), who, however, assumes that both plain and ever FRs can be both definite and universal.

<sup>17</sup>The reader might notice that the paraphrase is not entirely parallel to the one in (28-b). Constructing such a paraphrase yields (i), which is true in a situation where a number of people are elected and people honor most of them. This is certainly not the most prominent reading of (30-a) (if it is possible at all), which in turn suggests that attempts at reducing covariance with adverbial quantifiers to quantification over individuals (as envisioned by Berman 1991) are inadequate (see Article [*Nominal vs. adverbial quantification*]).

- (i) People honor most of the people who are elected.

- (30) a. People mostly honor whoever is elected. (Dayal 1997:112)  
 b. On most occasions in which somebody is elected, people honor that person.  
 c. It holds of all the elected people that they are honored most of the time/on most occasions.

Notice further that the FR in (30-a) qualifies as a definite-like ever FR: it is felicitous in a situation where there is a single person elected. This reading closely corresponds to the one of (31), which involves a covarying definite description.

- (31) (After an election) people mostly honor the person who is elected (in that election).

It remains to be seen whether universal-like FRs may covary, too. Following the predictions of Hinterwimmer (2008a) and others, covariation of universal quantifiers and hence also universal-like ever FRs should in principle be possible. In order to test this reliably, however, one would need a speaker who accepts *almost*-modification or NPI-licensing in universal-like ever FRs. My informant is not such a speaker, unfortunately, so I have to leave this datapoint open for future investigation.

An observation that goes back at least to Heggie (1988) is that ever FRs (as opposed to plain FRs) are unacceptable in **specificational pseudocleft constructions** (as compared with predicational pseudoclefts; see Article [*Copular sentences*]). Relevant examples are provided below.

- (32) a. What(\*ever) Mary bought was Barriers. *specificational*  
 b. What(ever) Mary bought was expensive. *predicational*  
 (Dayal 1997:103)

- (33) What(\*ever) I like about John is not his sense of humor. (Tredinnick 2005:50)

The observation was taken up by Iatridou & Varlokosta (1996, 1998), who framed it as an argument in favor of the UNIVERSAL position of ever FRs. Building on previous literature (Williams 1983; Partee 1986), Iatridou & Varlokosta assumed that subjects in specificational pseudocleft constructions must be referential/of type *e* (while they can be quantificational/of type  $\langle\langle e, t \rangle, t\rangle$  in predicational pseudoclefts). If plain FRs are referential but ever FRs are quantificational, the contrasts above follow.

The problem with this argument is that under certain conditions ever FRs can reach full acceptability in specificational pseudoclefts (see Dayal 1997 and Tredinnick 2005 for discussion). One of the ameliorating factors is negation, as shown in (34-a), and the identity of the subject (which should not be the speaker), as shown in (34-b).

- (34) a. ?Whatever Mary bought wasn't Barriers. (Dayal 1997:113)  
 b. Whatever Mary likes about John is not his sense of humor. (Tredinnick 2005:50)

The most salient if not the only reading of the ever FRs in (34) is the definite-like reading (affording the paraphrases *The thing Mary bought...* and *The thing(s) Mary likes...*, respectively). Plausible universal-like ever FRs in specificational pseudoclefts are hard to come up with, which we take to indicate tentatively that they do not exist. That in turn might suggest genuine universality of universal-like ever FRs.<sup>18</sup>

<sup>18</sup>Tredinnick (2005:50) argues that what she calls indifference ever FRs are incompatible with the semantics of specificational pseudoclefts. Since the set of universal-like ever FRs is a subset of indifference FRs (for Tredinnick), universal-like ever FRs would indeed be ruled out from specificational pseudoclefts, though for a different reason than implied by Iatridou & Varlokosta (1998).

### 2.3 The indefinite analysis

The INDEFINITE analysis receives initial support from the fact that some FRs seem to require a paraphrase by an indefinite NP, as illustrated in (35).<sup>19</sup>

- (35) a. John wants to write what sells well. (Wiltschko 1999:705)  
 b. John wants to write books that sell well.

The denotation of indefinite NPs has been a highly controversial issue and accordingly, there has been no consensus about the denotation of FRs as indefinites. Berman (1991), building on Heim's (1982) work on (in)definiteness, proposes that FRs denote open propositions with the *wh*-word corresponding to the free variable, as illustrated in (36-a-i). The open proposition either acts as the restrictor of adverbial quantifiers or, in their absence, gets existentially closed, effectively lending existential (indefinite) semantics to the FR. Following the literature on indefinites, one could devise at least two further types of analyses: indefinite FRs could denote non-quantificational properties (see also Article [*Noun incorporation*]), illustrated in (36-a-ii), or existential quantifiers (see also Article [*Wide scope indefinites*]), illustrated in (36-a-iii).<sup>20</sup> I will not attempt to defend one account or another and will concentrate on the empirical arguments.

- (36) a.  $\llbracket \text{what sell(s) well} \rrbracket =$   
 (i)  $\text{thing}'(x) \wedge \text{sell}'(x)(\text{well}')$  *open proposition*  
 (ii)  $\lambda x[\text{thing}'(x) \wedge \text{sell}'(x)(\text{well}')]$  *property*  
 (iii)  $\lambda P.\exists x[\text{thing}'(x) \wedge \text{sell}'(x)(\text{well}') \wedge P(x)]$  *existential quantifier*  
 b.  $\llbracket (35\text{-a}) \rrbracket = 1$  iff  
 $\text{want}'(\exists x[\text{write}'(x)(\text{John}') \wedge \text{sells}'(\text{well}')(x)])(\text{John}')$   
 (John wants there to be things that he writes that sell well)

#### Empirical evidence

The fact that FRs exhibit **quantificational variability** (QV), already discussed above in connection with the UNIVERSAL analysis, was originally used as an argument for the indefiniteness of FRs (by Berman 1991). However, it can be easily shown that the argument relies on a false premise: QV effects can be observed, given the right context, with definite and universal DPs as well. Thus, it turns out that QV effects are compatible with all the analyses of FRs. For an extensive discussion of QV effects and their relevance for analyzing FRs, see esp. Hinterwimmer (2008a,b, 2013).

It has been noted that FRs need not involve any presupposition of existence, i.e., they can be **non-specific** (see Article [*Kinds of (non-)specificity*]). It is commonly assumed that non-specificity is one of the hallmarks of indefiniteness. The example with which we started this section is, in fact, a case in point. It has a coherent interpretation where there is no book at the time of John's wanting to write one. Another example of this kind is in (37), which also seems coherent. If these examples, or more particularly the FRs in them presupposed the existence of an entity satisfying their descriptive content, they would be incoherent or even contradictory.

- (37) John didn't marry who he loves (because there is nobody he loves). (Wiltschko 1999)

It has been suggested, however, that the non-specificity argument cannot distinguish between the INDEFINITE and the DEFINITE analysis, as corresponding examples with definite descriptions

<sup>19</sup>Kotek & Erlewine (2016) show that Chuj (Mayan) FRs are compatible with an indefinite (existential) reading, but apparently only if they are selected by an existential predicate.

<sup>20</sup>Wiltschko (1999) presents the most forceful argument for the INDEFINITE position but offers no formal account. We will get to her arguments shortly.

also afford coherent readings. It has been argued that the relevant reading involves reference to kinds (see Tredinnick 2005 and esp. Hinterwimmer 2008b,a, 2013; see also Article [*Generics*]).

- (38) John didn't marry the person he loves (because there is no person he loves).  
(Tredinnick 2005:54)

What is worse, the putative non-specificity of FRs seems to be contingent on the non-episodicity of the event in the description of the FR. Once the event is episodic (and the kind reading is lost), the non-specific reading disappears and the result is incoherent.<sup>21</sup>

- (39) John didn't marry who(ever) he met in Canada (# because there is nobody he met in Canada).  
(Tredinnick 2005:55)

The interaction of negation and ever FRs was also discussed in section 2.1 but from the perspective of the hypothesis that ever FRs are universal quantifiers. If we try to apply the non-specificity argument to them, we find that there are ever FRs, of both the definite-like and universal-like kind (the latter with *ever* stressed), that can be “non-specific” in the relevant sense; see (40). The resulting reading is one under which the FR denotes in the domain of people that John's parents would choose for him; like before, there is no implication of the existence of such people in the actual world.

- (40) John doesn't want to marry whoever/whoEVER his parents choose for him.

Wiltschko (1999) provides a number of further arguments for the INDEFINITE position, which I will not discuss here in detail because they are rather limited in applicability or build on a problematic premise. In particular, she argues (i) that FRs (in general) disallow collective readings (seeking an analogy with generically interpreted singular indefinites, despite the fact that not all FRs correspond to generic expressions),<sup>22</sup> (ii) that FRs, like singular indefinites but unlike singular definites, cannot figure in generic readings that have been labeled ‘collective property’ readings by Krifka et al. (1995) (only applicable to generic readings),<sup>23</sup> (iii) that wh-words in general are indefinite (an argument that presupposes the so called head analysis of FRs, i.e. an analysis where the wh-word that introduces the FR is its syntactic head; this analysis is not generally adopted nowadays; see van Riemsdijk 2017).

## 2.4 Summary

Table 2 summarizes the empirical findings for the three subtypes of FRs and compares them to three types of nominal expressions: definite descriptions, universal quantifiers, and indefinites. The checkmark ✓ indicates the possibility of using the relevant expression in the indicated function or of having the indicated property and ✗ indicates the impossibility thereof. Regarding the controversial datapoints (esp. *almost*-modification and NPI-licensing in universal-like ever FRs), the table reflects the more liberal judgments of Tredinnick (2005). It is clear, however, that the status of these generalizations should be subject to further empirical testing.

The empirical facts present a strong case in favor of the DEFINITE position. At the same time, however, we see that there is a clear division between the two types of ever FRs and

<sup>21</sup>The correlation between non-episodicity and kind-readings of FRs was also observed by Wiltschko (1999). Her explanation relies on the ambiguity of indefinites, which can receive kind-like interpretations in generic contexts (e.g. *A dog barks*).

<sup>22</sup>Moreover, examples where FRs are interpreted collectively are not hard to find, consider *Who(ever) disagrees with the reforms will gather in front of the parliament* or *What we lost outnumbers what we found*. See also Grosu & Landman (1998) and Tredinnick (2005) for the discussion of collectivity and distributivity in FRs.

<sup>23</sup>Wiltschko's example is *The German customer* / *\*A German customer* / *\*Who(ever) is a German citizen bought 11.000 BMWs last year* (intended reading: collective). Yet, the comparison between *The German customer* and *Who(ever) is a German citizen* is unfair because *The person who is a German customer* behaves like the latter.

	PLAIN FRs	DEF.-LIKE EVER FRs	DEFINITES	UNIV.-LIKE EVER FRs	UNIVERSALS	INDEFINITES
Quantificational variability	✓	✓	✓	?	✓	✓
“Non-specific” readings	✓	✓	✓	✓	✓	✓
Maximality	✓	✓	✓	✓	✓	✗
Specificational pseudoclefts	✓	✓	✓	✗	✗	✓
Discourse anaphor	✓	✓	✓	✗	✗	✗
Antecedent to disc. anaphor	✓	✓	✓	✗	✗	✗
Narrow $\forall$ -scope wrt negation	✗	✗	✗	✓	✓	✗
<i>Almost</i> -modification	✗	✗	✗	✓	✓	✗
NPI licensing	✗	✗	✗	✓	✓	✗
Pivot in existentials	✗	✗	✗	✗	✗	✓

Table 2: Evidence used in the DEFINITE/UNIVERSAL/INDEFINITE debate

that universal-like ever FRs consistently behave as universal quantifiers, suggesting that the DEFINITE analysis is not fully adequate in its present form and that the UNIVERSAL analysis is also needed. While the idea of a definite–universal ambiguity along the lines of the formal plain–ever division might be an attractive one (though demonstrably false), postulating an ambiguity within the class of ever FRs, while logically possible, seems rather suboptimal. I refer the reader to Tredinnick (2005) to see how the universal effects of universal-like ever FRs can be modeled within the DEFINITE analysis: the basic idea is that whatever universal effects ever FRs exhibit are due to implicit universal (or generic) quantification over situations rather than over the individuals denoted by the FR.

The upcoming section presents a detailed analysis of the ever morpheme as it has developed over the past 20 years, particularly within the DEFINITE approach.

### 3 The semantics of ever free relatives

This section concentrates on the semantic contribution of the ever morpheme in ever free relatives. The discussion is distributed over three subsections. In 3.1 two prominent properties of ever free relatives are introduced: modal inferences and the variation requirement. Section 3.2 discusses ever free relatives which lack modal inferences but still require their referent to vary. Section 3.3 contributes novel crosslinguistic data and shows how it informs the semantic approaches to ever free relatives.

#### 3.1 Modal inferences and the variation requirement

The most influential proposal about the semantic contribution of the ever morpheme originates in the work of Veneeta Dayal (1997) and is embedded in the DEFINITE approach to FRs, assuming a unified analysis of definite-like and universal-like ever FRs. Dayal made two crucial insights about the properties of ever FRs (as opposed to plain FRs), namely (i) that ever FRs contribute a **modal inference**, i.e., they convey something about non-actual possible worlds or situations, and (ii) that the reference of an ever FR is not constant across all the relevant possible worlds or situations, what is often referred to as a **variation requirement**.<sup>24</sup> Let us first illustrate these properties on example (41).

(41) Whatever is now playing at the Avon (#namely *Arrival*) is making a lot of money.

<sup>24</sup>There is convincing evidence that (non-)constant *reference* is not the right concept behind the variation requirement. Variation must arguably be defined either via so-called *individuating properties* (Condoravdi 2015) or a special kind of noun-meaning called a *sort*, which includes the meaning of both common nouns and proper names (Heller & Wolter 2011). Closer discussion of this issue is beyond the scope of this paper.

A prominent interpretation of this sentence implies that the speaker does not know what is now playing at the Avon (which is indicated by the infelicity of using a *namely*-apposition). This type of modal inference is the hallmark of the so-called *ignorance reading* of ever FRs (see also Article [*Free choice items and modal indefinites*]). In fact, the implication is typically stronger than that: not only does the speaker not know what is now playing at the Avon, she even has *no settled belief* about that.<sup>25</sup> In either case, what we learn from (41) is not just that the movie that is now playing at the Avon is making a lot of money (which would be the contribution of a corresponding plain FR), but also that the speaker does not know / has no belief about what the movie is. Dayal (1997) demonstrates that this modal inference is closely tied to the second property of ever FRs—the variation requirement. Not knowing the referent of the movie that is now playing at the Avon corresponds to considering two types of possible worlds which differ in the identity of the movie: the actual world, in which the Avon is now showing, say, *La La Land*, and some possible world(s) compatible with speaker’s beliefs in which the Avon is now showing something else, e.g. *Arrival*. Not having a settled belief about the identity of the movie in question corresponds to there being at least two types of possible worlds compatible with what the speaker believes which, again, differ in the identity of the movie. This means that the speaker considers it possible that the Avon is showing, say, *La La Land*, and at the same time, she considers it possible that the Avon is showing something else, e.g. *Arrival* (without implying that the speaker believes that the Avon is showing more movies at the same time). In either case, it holds that the referent of the ever FR is not constant across the possible worlds considered in the utterance situation.

Another type of ever FR reading is the so called *indifference reading*, discussed first systematically by von Stechow (2000), and illustrated by example (42).

(42) John voted for whoever was at the top of the ballot (namely for Clinton).

This sentence implies that John did not care much about the identity of who he voted for, i.e., he acted indifferently (the fact that no speaker ignorance (or lack of belief) need to be involved here is evidenced by the felicity of the *namely*-apposition). von Stechow argues that the possibilities relevant for the interpretation of indifference ever FRs are *counterfactual*, particularly possible worlds in which there is somebody else at the top of the ballot than in actuality. In effect, the sentence in (42) conveys not only that John voted for the person that was at the top of the ballot, but also that if there had been somebody else at the top of the ballot, John would still have voted for that person. Note that also in this type of reading the modal (counterfactual) inference is intimately tied to non-constant reference of the ever FR, whereby the identity of the person at the top of the ballot differs in the relevant possible worlds (actual vs. counterfactual).

The ignorance and indifference readings of ever FRs differ not only in the kind of possible worlds relevant for interpretation (knowledge/belief-based vs. counterfactual), but also in whether their modal inferences can be “at issue”.<sup>26</sup> While at-issue inferences can be targeted by sentence-internal operators such as negation or attitude predicates, not-at-issue inferences cannot. The examples in (43) demonstrate that the ignorance inference is not at issue, but the indifference inference is. As the continuations indicate, (43-a) cannot convey that Mary doubts speaker’s ignorance about the identity of the movie currently showed at the Avon, whereas (43-b) can convey that Mary doubts John’s indifferent behavior during the vote.

(43) a. Mary doubts that whatever is now playing at the Avon is making a lot of money, on the contrary. . .  
#she believes that I know what they’re playing at the Avon.

<sup>25</sup>This is similar although not logically equivalent to saying that the speaker knows that she doesn’t know what is now playing at the Avon.

<sup>26</sup>For an accessible discussion of at-issueness, see Simons et al. (2011); see also Article [*Semantics vs. pragmatics*].

- b. Mary doubts that John (just) voted for whoever was at the top of the ballott, on the contrary. . .  
 . . . she believes that he inspected the ballot carefully.

The exact status of the not-at-issue ignorance inference is subject to debate. Dayal’s (1997) idea that the modal inference is asserted and hence at issue (Dayal proposed that ever FRs are quantifiers over a special kind of possible worlds) was proved incorrect by von Stechow (2000), who, based on examples similar to (43-a), proposed that the ignorance inference is a presupposition. Yet, as noticed by Lauer (2009) and Condoravdi (2015), while presuppositions can be negated by emphatic negation, the ignorance inference cannot, as illustrated by the contrast in (44).

- (44) a. A: The king of France is bald.  
 B: The king of France is NOT bald because there IS NO king of France.
- b. A: Whatever you bought was expensive.  
 B: #What I bought was NOT expensive because you KNOW what I bought!
- (Condoravdi 2015:233)

If the ignorance inference is not a presupposition, it follows that it is not an inherent property of ever FRs (or, in other words, a lexical-semantic property of the ever-morpheme) to convey modality. Lauer (2009) attempts to generalize this conclusion, proposing a non-modal semantics not just for ignorance FRs, but also for indifference FRs, suggesting that modal inferences in the absence of overt modals are just an epiphenomenon of the variation requirement. Exposing Lauer’s argumentation goes beyond the scope of this paper. Nevertheless, in what follows I discuss some examples of what has been considered non-modal ever FRs.

### 3.2 Non-modal ever FRs

Consider example (45), used as a description of a particular examination in the past. The continuation in (45-a) shows that the example does not necessarily convey speaker ignorance (it is possible to exhaustively specify the tasks Dave was given) or the indifference / counterfactual inference (it is not entailed that if the tasks had been different, Dave would still have solved them). As the comparison between (45-a) and (45-b) reveals, however, the sentence strongly implies that Dave was assigned multiple tasks. This state of affairs clearly contrasts with the ignorance and indifference FRs, where single referents were completely acceptable, and illustrates, once again, the difference between definite-like and universal-like ever FRs (introduced in section 1.2 and assumed throughout section 2).<sup>27</sup>

- (45) Dave solved whatever task the examiner gave him, . . .
- a. . . which happened to be phonetic transcription, morphological decomposition, and constituent analysis. And he was pretty lucky because those were just the tasks he prepared for.
  - b. #. . . which happened to be phonetic transcription.

Why are ignorance and indifference FRs coupled with definite-like (single referent) readings and non-modal FRs with universal-like (multiple referent) readings? The answer to this question lies in the different ways in which the variation requirement is satisfied. We have informally defined the variation requirement as a requirement that an ever FR must not have constant reference in relevant worlds or situations. In ignorance and indifference FRs, only one of the

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<sup>27</sup>Thanks to Joseph DeVeugh-Geiss for native-speaker judgments. See also Condoravdi (2015), who claims that in order for an ever FR to be non-modal, it must have a plural (or at least number-neutral) sortal (i.e., *whatever (tasks)* rather than *whatever task*). It is an open issue whether this is cross-speaker variation or whether there is another, yet to be discovered, factor behind the availability of non-modal readings.

relevant worlds/situations is implied to be the actual one, the other ones are merely *possible*. The one-to-one mapping between worlds/situations and FR-referents has the consequence that only a single referent is implied to be the actual one. The situation in (45) is different in that there are no non-actual possibilities that would be immediately relevant for the interpretation of the FR. Hence, the only way of satisfying the variation requirement is to split the examination situation into sub-situations such that each sub-situation involves a (different) task assigned to Dave.<sup>28</sup> The resulting truth conditions of (45) are given in (46).<sup>29</sup>

- (46) Every sub-situation (of the larger examination situation) in which Dave was given a task extended to a situation in which Dave solved that task.

This analysis relies on the assumption that examples like (45) involve a covert quantifier over (sub-)situations with default universal force. In the DEFINITE analysis, it is this quantifier over situations (rather than a quantifier over individuals) that lends universal-like ever FRs their apparent universal force. See Tredinnick (2005) for a discussion of how this covert situation quantifier (in conjunction with some additional factors) can be held responsible for the universal effects like modification by *almost*-adverbs or NPI-licensing (discussed here in sections 2.1 and 2.2).

Independent support for this analysis of non-modal universal-like ever FRs comes from the fact (discussed e.g. by Tredinnick 2005 and Lauer 2009) that the variation requirement can also be satisfied with respect to the domain of an overt adverbial quantifier, as in (47).<sup>30</sup> Also in this case, there are no obligatory modal inferences: all the exam-situations quantified over by *always/usually* are actual situations and it is not necessary for ignorance or counterfactual inferences to arise. The reason why (45) and (47-a) are not necessarily truth-conditionally equivalent is that overt adverbials like *always* quantify over situations that are temporally non-overlapping and typically relatively temporally distant from one another.

- (47) a. Dave **always** solved whatever task the examiner gave him.  
 ≈ Every situation in which Dave was given a task extended into a situation in which he solved that task.
- b. Dave **usually** solved whatever task the examiner gave him.  
 ≈ Most situations in which Dave was given a task extended into a situation in which he solved that task.

Let us further consider example (48), which differs minimally from (45) in that it speaks about a situation in the future (see Article [*Reference to future events*]). The continuation indicates that the example is compatible with a scenario in which a single task will be assigned to Dave. Even though it is difficult to rule out an ignorance or indifference reading of this ever FR, it is possible to analyze it in a “non-modal” fashion, too, while predicting the multiple- vs. single-referent contrast between (45) and (48). Following the standard assumption that the future tense is a quantifier over possible continuations of the actual world (see Copley 2009), we can assume that each of the relevant possible continuations contains a (different) task assigned to Dave during the examination. In this way, the variation requirement is satisfied not by distributing referents across different beliefs (ignorance) or counterfactual situations (indifference), but simply across different future possibilities.

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<sup>28</sup>These situations can but need not have different temporal traces, i.e., each task could have been given to Dave at a different time (plausibly one after another, resulting in an iterative reading) or they were all given to Dave at the same time.

<sup>29</sup>For a background on situation semantics and quantification over (minimal) situations, see Kratzer (2014).

<sup>30</sup>Lauer (2009) argues that the variation requirement can even be satisfied with respect to the domain of an individual quantifier (particularly *every NP*)—yet another kind of non-modal ever FRs.



- (48) Dave will solve whatever task the examiner will give him, ...  
 ... it will probably be phonetic transcription.

### 3.3 Ever FRs crosslinguistically: restrictions on modal inferences

The semantics of ever FRs has largely been developed for English. A crosslinguistic perspective reveals, however, that the distribution of English ever FRs is unusually broad, and so is the range of their possible meanings. As already noted in section 1.2 and repeated here, the definite-like interpretation of Greek ever FRs is not available, as opposed to the universal-like interpretation. The Czech example (50) shows that Greek is not alone in exhibiting this restriction. In fact, there seem to be more languages like Czech and Greek than languages like English, with Hungarian, Italian, Romanian, and Russian also belonging to this type. Definite-like ever FRs are available, besides English, in Serbian, Polish, and Hebrew.<sup>31</sup>

- (49) *Greek* (Giannakidou & Cheng 2006:166/169)
- a. #Opjadhípotē jínēka ínē í arxísindaktría aftou to períodikou, píre  
 which:EVER woman is the editor this:GEN the:GEN magazine:GEN got  
 ena vravío xthēs vradi.  
 a prize last night  
 Intended: ‘Whichever ( $\approx$  The) woman (who) is the editor of this magazine got a  
 prize last night.’
- b. Opjodshípotē írthē sto partí, efxarístithikē.  
 who:EVER came:3SG to.the party was.happy:3SG  
 ‘Whoever ( $\approx$  Everyone who) came to the party had a good time.’
- (50) *Czech*
- a. \*Kdokoliv je šéfredaktorem tohoto časopisu, dostal včera cenu.  
 who:EVER is editor-in-chief this:GEN magazine:GEN got yesterday prize  
 Intended: ‘Whoever is the editor-in-chief of this magazine [I don’t know who it is]  
 got a prize yesterday.’
- b. Kdokoliv přišel na tu party, náramně se bavil.  
 who:EVER came to the party greatly REFL had.fun  
 ‘Whoever [Everybody who] came to the party had great fun.’

The crosslinguistic study of ever FRs is likely to shed important new perspectives on the semantics of ever FRs in general. Among the questions it can help answer are the following: Are all ever FRs really definite? Or is the definite-like vs. universal-like dichotomy known from English indicative of a real ambiguity? What modal inferences, if any, do ever FRs in other languages exhibit? What are the parameters behind the observed crosslinguistic variation?

The particular observation in (49)/(50) is compatible with two hypotheses: either ever FRs in languages like Greek and Czech (i) are not definite or (ii) cannot convey the inference of ignorance, on which (49-a)/(50-a) seem to depend. I will show in what follows that the latter hypothesis is more likely to be true.<sup>32</sup> Consider the examples in (51), in which the ever FR naturally receives a definite-like interpretation (a universal-like interpretation is pragmatically ruled out, assuming that one channel only shows one show at a time). The example is parallel to (48), discussed in section 3.2, and is compatible with the assumption that no ignorance or indifference is being conveyed. The variation requirement, which, by hypothesis, applies to ever FRs in all languages, is satisfied with respect to the quantificational domain of the future

<sup>31</sup>The references on which this is based are the following: von Stechow 2000 (Hungarian), Eilam 2007 (Hebrew), Caponigro & Fălăuș 2018 (Italian, Romanian), and Šimík to appear (Serbian, Polish, Hebrew, Greek, Russian, Czech, and Romanian).

<sup>32</sup>The following discussion and examples are based on Šimík (to appear).

auxiliary (quantifier over possible continuations of the actual world): the identity of the relevant HBO show differs from one possible world to another.

- (51) a. *Czech*  
 Dnes večer v osm **bude** David sledovat, cokoliv budou dávat na HBO.  
 today evening at eight will D. watch what.EVER will give on HBO  
 ‘Tonight at eight, David will be watching whatever they’ll be showing on HBO.’
- b. *Russian*  
 Segodnja v 8 časov Miša **budet** smotret’ čto by ni pokazyvali po HBO.  
 today at 8 o’clock M. will watch what SUBJ EVER showed on HBO  
 ‘Tonight at 8pm M. will be watching whatever they will be showing on HBO.’

Yet another piece of evidence for a definite-like interpretation of ever FRs in Czech and Russian is in (52) (analogous to (47) above, also as pertains to the lack of obligatory modal inferences), where the reference varies within the domain of the quantificational adverbial ‘always’ and where there is no implication that at each occasion, multiple meals are cooked and all of them eaten (thus: no support for universal quantification (over individuals) beyond what is contributed by ‘always’).

- (52) a. *Czech*  
 Na večeri David ( **vždycky**) jedl, cokoliv mu jeho přítelkyně připravila.  
 for dinner D. always ate what:EVER him his girlfriend prepared  
 ‘David (always) ate for dinner whatever his girlfriend prepared for him.’
- b. *Russian*  
 Miša ( **vsegda**) el na užin čto by emu ni prigotovila ego podругa.  
 M. always ate for dinner what SUBJ him EVER prepare his girlfriend  
 ‘Miša (always) ate for dinner whatever his girlfriend prepared for him.’

To sum up, we have seen that if certain conditions are satisfied, Czech and Russian ever FRs exhibit definite-like behavior. Moreover, the data presented thus far are compatible with the hypothesis that Czech and Russian ever FRs cannot convey the ignorance inference, or more precisely, they cannot depend on ignorance as the sole source of the variation requirement.

Further examples reveal that Czech and Russian do not have indifference ever FRs, either.<sup>33</sup> Again, this is not to say that indifference is not compatible with ever FRs in these languages—both (51) and (52) above can (quite naturally, in fact) be accompanied by an indifference inference—but having the ever FR refer in counterfactual worlds clearly cannot be the sole source of satisfying the variation requirement.

- (53) a. *Czech*  
 \*V tom okamžiku David vzal, cokoliv bylo po ruce, konkrétně kladivo.  
 at that moment D. took what:EVER was at hand particularly hammer  
 Intended: ‘At that moment, David took whatever was handy [he didn’t care what it was], namely a hammer.’
- b. *Russian*  
 \*V etot moment Miša vzjal čto by ni bylo pod rukoj, a imenno  
 in that moment M. took what SUBJ EVER was under hand and namely  
 metalličeskij prut.  
 metal bar  
 Intended: ‘At that moment, Miša took whatever was handy [he didn’t care what it was], namely a metal bar.’

<sup>33</sup>The same holds for Italian and Romanian; see Caponigro & Fălăuş (2018).

Let us now turn to Polish, which exhibits a mixed behavior: it does not have ignorance FRs (like Czech and Russian) but it does have indifference FRs (like English). As expected, Polish also has non-modal ever FRs. Notice that Eilam (2007) reports something similar about Hebrew, namely that indifference is preferred over ignorance (“if the ignorance reading is available at all”); yet, I failed to replicate this in my own research, in fact, I found quite the opposite: ignorance being preferred over indifference (see Šimík to appear).

(54) *Polish*

a. **Ignorance FR**

#Wczoraj o 8 wieczorem Jacek oglądał, cokolwiek puszczał na HBO.  
 yesterday at 8 evening J. watched what.EVER sent on HBO  
 Intended: ‘Yesterday at eight Jacek was watching whatever they were showing on HBO [I don’t know what it was].’

b. **Indifference FR**

Bartosz chwycił wtedy cokolwiek było pod ręką – złapał za  
 B. took at.that.moment what.EVER was under hand – grabbed at  
 młotek.  
 hammer  
 ‘At that moment, Bartosz took whatever was handy [he didn’t care what it was] – he grabbed a hammer.’

c. **Non-modal FR**

Na kolację Jacek (zawsze) jadł, cokolwiek jego dziewczyna ugotowała.  
 for dinner J. always ate what:EVER his girlfriend cooked  
 ‘Jacek (always) ate for dinner whatever his girlfriend cooked.’

For completeness, I am adding parallel data from Serbian, which is as liberal as English.

(55) *Serbian*

a. **Ignorance FR**

Juče u osam Miloje je gledao šta god su davali na  
 yesterday at eight Miloje AUX.3SG watched what EVER AUX.3PL gave on  
 HBOu.  
 HBO  
 ‘Yesterday at eight Miloje was watching whatever they were showing on HBO [I don’t know what it was].’

b. **Indifference FR**

U tom trenutku, Jovan je uzeo šta god mu je bilo pri ruci, konkretno:  
 at that moment Jovan AUX took what EVER him AUX was by hand particularly  
 čekić.  
 hammer  
 ‘At that moment, Jovan took whatever was handy, namely a hammer.’

c. **Non-modal FR**

Miloje je (uvek) večerao šta god mu je njegova devojka spremala.  
 M. AUX always ate what EVER him AUX his girlfriend prepared  
 ‘Miloje (always) ate whatever his girlfriend prepared for him.’

Table 3 summarizes the crosslinguistic findings. The data come from Šimík (to appear), unless indicated otherwise. The pattern is very clear and robust: while all languages have non-modal ever FRs, only some have modal ever FRs.

How does this crosslinguistic perspective inform us about the theory of ever FRs? First of all, it strongly suggests that the modal component (particularly ignorance or indifference) should

	NON-MODAL	MODAL	COMMENT
English	✓	✓	most of the literature cited in this paper
Serbian	✓	✓	
Hebrew	✓	✓	ignorance preferred (contra Eilam 2007)
Polish	✓	✓	indifference preferred
Czech	✓	✗	
Greek	✓	✗	
Hungarian	✓	✗	Anna Szabolcsi via von Fintel (2000)
Italian	✓	✗	Caponigro & Fălăuş (2018)
Romanian	✓	✗	
Russian	✓	✗	

Table 3: Crosslinguistic availability of modal inferences in ever FRs

not be treated as an inherent property of ever FRs / lexical property of the ever morpheme. This goes counter much initial work on the semantics of ever FRs, particularly Dayal (1997), von Fintel (2000), and Tredinnick (2005), where modal ever FRs were taken to be the default and what appeared to be non-modal ever FRs were treated as special cases of indifference ever FRs. In this respect, Lauer’s (2009) (and partly Condoravdi’s 2015) approach, in which modal inferences of ever FRs are considered essentially conversational, represents progress. At the same time, however, this approach has nothing to offer as an explanation of the unavailability of modal inferences as the source variation requirement in so many languages. Last but not least, it should be pointed out that even in the light of the crosslinguistic picture, the DEFINITE analysis, combined with the variation requirement, still does the best job at capturing the facts of ever FRs. Despite the apparent lack of definite-like ever FRs in some many languages, there are good arguments to reject the UNIVERSAL analysis.

Clearly, more empirical and theoretical research is needed to get to grips with the crosslinguistic pattern and with the particular restrictions found in individual languages, such as the preference for indifference in Polish vs. preference for ignorance in Hebrew. I refer the reader to Šimík (to appear) for some initial discussion on how the non-modal vs. modal divide could be captured.

## 4 Compositionality (syntax-semantics interface)

Previous sections concentrated on the meaning of FRs as a whole. In this section, we look at the issue of how the meaning can be compositionally derived (see Article [*Compositionality*]). I start out by discussing the predominant property-based analysis (section 4.1) and then turn to two recent proposals according to which FRs are semantically based on corresponding wh-questions (section 4.2). What is not discussed is the compositional contribution of the ever morpheme, as it has typically been considered syncategorematic (non-compositional); see, e.g., Dayal (1997), von Fintel (2000), or Lauer (2009).

### 4.1 The property-based analysis

Under the property-based analysis, FRs start out their derivation as expressions of type  $\langle e, t \rangle$ .<sup>34</sup> The FR in (56-a), for instance, denotes a function that takes an entity as its argument and returns truth just in case that entity is in the fridge and falsity otherwise. A more concise

<sup>34</sup>A more proper analysis would take the intensionality of the property into account; i.e., FRs should be of type  $\langle e, \langle s, t \rangle \rangle$  or  $\langle s, \langle e, t \rangle \rangle$ .

formulation that I will rely on from now on is that the FR denotes a function that characterizes the set of things that were in the fridge. (56-b) provides the standard lambda notation.

- (56) a. I ate what was in the fridge.  
 b.  $\llbracket \text{what was in the fridge} \rrbracket = \lambda x[\text{thing}'(x) \wedge \text{in.fridge}'(x)]$

The reason a clause denotes a property rather than a proposition (or a truth-value) is the fronted wh-word, which abstracts over the variable corresponding to the trace in its base position. There are two common ways of semantically composing wh-words with their gapped sisters: (57), assumed in Groenendijk & Stokhof (1984) for wh-questions, Heim & Kratzer (1998) for headed relatives, and Cooper (1983) or Šimík (2011) for wh-constructions in general, and (58), assumed in Caponigro (2003, 2004) for wh-constructions in general. Under (57), wh-words are indexed and can directly function as triggers of the operation of lambda abstraction (as in Heim & Kratzer 1998:96). Beyond that, they contribute a restriction on the variable they bind (thing' in the case of *what*). (58) achieves the same in more steps. Wh-movement (like quantifier raising in Heim & Kratzer 1998, among many others) is accompanied by the insertion of an index that binds the trace of the wh-word. The index-supplemented sister of the wh-word is interpreted by lambda abstraction, just like in (57). The wh-word itself is a partial identity function (mapping properties to properties), contributing a restriction on the bound variable.<sup>35</sup>

- (57)  $\llbracket \text{what}_1 [\text{TP } t_1 \text{ was in the fridge}] \rrbracket = \lambda x[\text{thing}'(x) \wedge \text{in.fridge}'(x)]$   
 (58)  $\llbracket \text{what } 1 [\text{TP } t_1 \text{ was in the fridge}] \rrbracket = \llbracket \text{what} \rrbracket(\llbracket 1 [\text{TP } t_1 \text{ was in the fridge}] \rrbracket)$   
 $= \lambda P \lambda x[\text{thing}'(x) \wedge P(x)](\lambda y[\text{in.fridge}'(y)]) = \lambda x[\text{thing}'(x) \wedge \text{in.fridge}'(x)]$

It is commonly assumed that the set characterized by the FR contains both atomic and plural entities. This is indicated in (59-a) for the universe of three things. Jacobson's (1995) original property analysis is specific in the assumption that the FR characterizes the singleton set containing the maximal entity in (59-a), i.e., (59-b). According to Jacobson, this is a consequence of the inherently exhaustive meaning of the wh-word, given in (60) for *what*.

- (59) a.  $\{\mathbf{a}, \mathbf{b}, \mathbf{c}, \mathbf{a+b}, \mathbf{a+c}, \mathbf{b+c}, \mathbf{a+b+c}\}$   
 b.  $\{\mathbf{a+b+c}\}$   
 (60)  $\llbracket \text{what} \rrbracket = \lambda P \lambda x[\text{thing}'(x) \wedge P(x) \wedge \forall y[P(y) \rightarrow y \leq x]]$

There are a number of ways to derive the desired definite interpretation (61) from the property. All of them rely on some kind of a type-shifting procedure which shifts the property to the maximal entity that satisfies it (Partee 1987). Jacobson (1995), for instance, directly uses the  $\iota$ -shift, which is possible thanks to the singleton nature of the FR denotation in her analysis. Approaches under which the FR denotes (59-a) require Link's (1983)  $\sigma$  (Caponigro 2003, 2004; Hinterwimmer 2008a) or apply two sequential operations: the MAX operator, which first shifts (59-a) to (59-b), and then the  $\iota$ -operator (Grosu & Landman 1998).

- (61)  $\sigma x[\text{thing}'(x) \wedge \text{in.fridge}'(x)]$

Most authors (Grosu & Landman 1998; Caponigro 2003, 2004; Giannakidou & Cheng 2006; Hinterwimmer 2008a,b, 2013) assume that the type-shifting procedure is represented syntactically—by a D head that selects the wh-clause. The resulting definite interpretation of FRs is then arrived at compositionally—by applying the meaning of the D head to the wh-clause, as illustrated in (62).

<sup>35</sup>The two approaches are difficult to distinguish empirically. Yet, as pointed out in Šimík (2011:125ff.), the latter approach has difficulties handling constructions with multiple wh-fronting, such as multiple wh-questions in some languages or multiple-wh modal existentials.

$$(62) \quad \begin{aligned} \llbracket_{\text{DP}} \text{D} \llbracket_{\text{CP}} \text{what was in the fridge}\rrbracket\rrbracket &= \llbracket \text{D} \rrbracket(\llbracket \text{CP} \rrbracket) = \lambda P \sigma x [P(x)](\lambda y [\text{thing}'(y) \wedge \\ &\text{in.fridge}'(y)]) \\ &= \sigma x [\text{thing}'(x) \wedge \text{in.fridge}'(x)] \end{aligned}$$

Yet, a purely semantic type-shift, assumed e.g. by Jacobson (1995), achieves the same effect and should be preferred on grounds of parsimony. Indeed, there seems to be no convincing evidence for the existence of the D head. Some authors argue for it on morphological grounds, relying on the observation that in some languages wh-words in FRs are composed of a (defective/non-agreeing) definite article attached to the interrogative wh-word, as already discussed in section 1.1. Greek, as analyzed by Giannakidou & Cheng (2006), is a case in point. Giannakidou & Cheng argue that the FR wh-word *opjos* ‘REL.who’, lit. ‘the.who’, should be decomposed—syntactically and semantically—into *o-* and *pjos*, as indicated in (63).

$$(63) \quad \llbracket_{\text{DP}} [\text{D } o-] \llbracket_{\text{CP}} \text{pjos} \dots\rrbracket\rrbracket$$

The problem that makes this analysis hard to accept is that the very same wh-word, namely *opjos*, is used as the relative operator in (light) headed relative clauses, where type-shifting at the level of the relative is not only not needed but even disallowed.<sup>36</sup>

## 4.2 Two question-based analyses

There are two recent proposals that build on the well-known formal similarity between free relatives and wh-questions, albeit both in quite different ways and with different motivations. Chierchia & Caponigro (2013) represents a substantial overhaul of the standard property-based analysis and proposes that free relatives in general are not property-based, but rather wh-question-based. Hirsch’s (2016) proposal concerns ever free relatives only and can be seen as a natural extension of the property-based analysis. I discuss these two proposals in turn.

### Free relatives derived from wh-questions

Chierchia & Caponigro (2013) propose that FRs are derived from corresponding wh-questions. A wh-question denotes a set of propositions which correspond to the possible answers to the question (the so called Hamblin (1973)–Karttunen (1977) view of question semantics; see Article [*Questions and interrogatives*])—(64-a), or alternatively the characteristic function of such a set—(64-b). Note that a proposition corresponds to the (characteristic function of the) set of possible worlds in which it is true.

$$(64) \quad \begin{aligned} \llbracket \llbracket_{\text{Q}} \text{What is in the fridge?}\rrbracket \rrbracket &= \\ \text{a. } \{ &\lambda w.\text{in.fridge}'(w)(\mathbf{a}), \lambda w.\text{in.fridge}'(w)(\mathbf{b}), \lambda w.\text{in.fridge}'(w)(\mathbf{c}), \lambda w.\text{in.fridge}'(w)(\mathbf{a}+\mathbf{b}), \\ &\lambda w.\text{in.fridge}'(w)(\mathbf{a}+\mathbf{c}), \lambda w.\text{in.fridge}'(w)(\mathbf{b}+\mathbf{c}), \lambda w.\text{in.fridge}'(w)(\mathbf{a}+\mathbf{b}+\mathbf{c})\} \\ \text{b. } &\lambda p \exists x. x \in \{\mathbf{a}, \mathbf{b}, \mathbf{c}, \mathbf{a}+\mathbf{b}, \mathbf{a}+\mathbf{c}, \mathbf{b}+\mathbf{c}, \mathbf{a}+\mathbf{b}+\mathbf{c}\} \wedge p = \lambda w.\text{in.fridge}'(w)(x) \end{aligned}$$

Chierchia & Caponigro propose that a free relative—semantically an entity—is derived from the corresponding wh-question—semantically a (characteristic function of a) set of propositions—in three steps (I omit the domain restriction of  $x$  for the sake of simplicity). The first step is a shift to the maximal true answer by Dayal’s (1996) answerhood operator ANS, see (65-a). This is a proposition that entails all the true answers to the question (if, e.g.,  $\mathbf{a}+\mathbf{b}$  and nothing else is in the fridge, then it is entailed that  $\mathbf{a}$  is in the fridge and that  $\mathbf{b}$  is in the fridge). The second step, shown in (65-b), relies on Chierchia & Caponigro’s original idea, namely that there is a specialized operator, called TP (from “topical property”), which maps the maximal true

<sup>36</sup>The standard analysis of headed relatives, going back to Quine (1960) and Rodman (1972), builds on the idea that they denote properties (sets of individuals), which intersect with the property denoted by the head noun. If the headed relative had shifted to an entity-type expression, it could not be combined with the head noun.

answer to a property.<sup>37</sup> If  $\mathbf{a+b}$  is in the fridge in  $w$ , then the property corresponds to a function that characterizes the pairing of  $w$  with the singleton set  $\{\mathbf{a+b}\}$ , i.e., the set that contains the maximal entity that is in the fridge. Notice that this denotation corresponds to Jacobsonian denotation of free relatives prior to the shift to an entity. The last step—the shift to an entity by the abstract definite determiner D—is illustrated in (65-c). It yields the (function from worlds  $w$  to the) maximal entity that is in the fridge in  $w$ , e.g.  $\mathbf{a+b}$ , which corresponds to the conventional denotation of free relatives under the DEFINITE analysis.

$$(65) \quad \llbracket \llbracket_Q \text{ What is in the fridge?} \rrbracket \rrbracket = \lambda p \exists x. p = \lambda w. \text{in.fridge}'(w)(x)$$

- a. **The maximal true answer** (after Dayal 1996)  
 $\text{ANS}(w)(\llbracket Q \rrbracket) = \iota p p \in \llbracket Q \rrbracket \wedge p(w) \wedge \forall q [q \in \llbracket Q \rrbracket \wedge q(w) \rightarrow p \subset q]$
- b. **Topical property (TP)**  
 $\text{TP}(\text{ANS}(w)(\llbracket Q \rrbracket)) = \lambda w \lambda x. P(w)(x) = \text{ANS}(w)(\llbracket Q \rrbracket)$
- c. **Free relative**  
 $\text{D}(\text{TP}(\text{ANS}(w)(\llbracket Q \rrbracket))) = \lambda w. \sigma x P(w)(x) = \text{ANS}(w)(\llbracket Q \rrbracket)$

The empirical support for deriving FRs from corresponding wh-questions is constituted by two kinds of arguments. First, Chierchia & Caponigro (2013) argue that the definiteness (maximality) of free relatives closely corresponds to the exhaustivity of wh-questions (a point made by Jacobson 1995, too; see Article [*Questions and interrogatives*] for a discussion of exhaustivity in wh-questions): if a wh-question is interpreted as exhaustive, its corresponding free relative is interpreted as definite; if, on the other hand, a wh-question is interpreted as non-exhaustive (so called *mention some* reading), then its corresponding free relative is claimed to be indefinite. The second argument comes from what Chierchia & Caponigro call Caponigro’s generalization, quoted in (66).

$$(66) \quad \text{Caponigro’s generalization}$$

If a language uses the wh-strategy to form both Qs and FRs, the wh-words found in FRs are always a subset of those found in Qs. Never the other way around. Never some other arbitrary relation between the two sets of wh-words.

Caponigro’s generalization is derived by the question-based analysis because TP and D can be partial functions; i.e., it comes as natural that not all questions can give rise to a corresponding free relative. The property-based analysis, on the other hand, does not predict any systematic relation between wh-questions and FRs: they both share a common derivational “ancestor” (the property), but are not derived from one another.<sup>38</sup> Even though the operators that derive FRs and questions (say, D and Q, respectively) from the property they have in common can correspond to partial functions, there is nothing that ensures the kind of partiality that would comply with Caponigro’s generalization.

I believe that the validity of the argument based on Caponigro’s generalization is somewhat limited. The reason is that Caponigro’s generalization is just a special case of what could be called generalized Caponigro’s generalization, formulated in (67).

$$(67) \quad \text{Generalized Caponigro’s generalization}$$

If a language uses the wh-strategy to form a non-interrogative construction (e.g. free relatives, headed relatives, comparatives, indefinites), then the wh-words found in that non-interrogative construction are always a subset of those found in questions. Never some other arbitrary relation between the two sets of wh-words.

<sup>37</sup>Liu (2018: Chapter 7), building on Zimmermann (1985), shows that there is general conceptual problem with the proposed operator.

<sup>38</sup>The idea that FRs and questions derive from a common property is relatively wide-spread and generally accepted. Particular accounts relying on this idea include Cooper (1983) and Jacobson (1995).

A less formal way of formulating (67) is to say that wh-words function *primarily* as question words. From that perspective, it makes sense that all wh-words are used in questions, and only their subset are used in any derived construction. Now the problem with Chierchia & Caponigro’s logic is that while it might make sense to use questions (along with their properties like exhaustivity) as the semantic basis for free relatives, it is far from obvious that questions (and their exhaustivity) can be used as the semantic basis for other wh-constructions, say headed relatives or wh-based indefinites. This indicates that a different explanation of both (66) and the more general (67) might be needed.

### Ever free relatives as wh-questions and free relatives

Hirsch’s (2016) proposal is conservative in that it relies on the property-based analysis of free relatives. Its novelty lies in the idea that the property is used “twice” in one and the same sentence: once as input to a question operator—yielding a set of propositions—and once as input to a definite determiner—yielding an entity. More particularly, Hirsch proposes that a sentence like (68-a) has the LF in (68-b), where Q is the question operator, D a definite determiner,  $\square$  a universal quantifier over worlds, expressing by default universal quantification over worlds compatible with speaker’s beliefs, and Op is an alternative-semantic operator, universally quantifying over the propositional alternatives introduced by Q.<sup>39,40</sup>

- (68) a. John ate whatever (it was) Mary cooked.  
 b. Op [ $\square$  [Q whatever Mary cooked]] John ate [D whatever Mary cooked].

The motivation for using question semantics is that it brings ever free relatives semantically close to unconditionals as analyzed by Rawlins (2013), which in turn affords some empirical advantages. Unconditionals similar or corresponding to (68-a) are provided in (69). The examples show that the referent implied by an unconditional (*the thing that Mary cooked*) can (as in (69-a)) but need not (as in (69-b)) be anaphorically picked up in the consequent. According to the analysis developed in Rawlins (2013), unconditionals denote propositional alternatives and hence are semantically akin to questions. Each propositional alternative gives rise to a conditional of its own (see Article [*Indicative conditionals*]), whereby the consequent remains constant across alternatives (modulo the denotation of the anaphoric pronoun). The whole sentence is true if all the individual conditionals are true. The paraphrases in (70) make these truth conditions transparent.<sup>41</sup>

- (69) a. Whatever (it was) Mary cooked, John ate it.  
 b. Whatever (it was) Mary cooked, John left before lunch.
- (70) a. All the propositions in the following set are true: {If Mary cooked **a**, John ate **a**, If Mary cooked **b**, John ate **b**, If Mary cooked **a+b**, John ate **a+b**, ... }  
 b. All the propositions in the following set are true: {If Mary cooked **a**, John left before lunch, If Mary cooked **b**, John left before lunch, If Mary cooked **a+b**, John left before lunch, ... }

Hirsch (2016) takes the formal and semantic similarity between ever FRs and unconditionals at face value and proposes to adapt Rawlins’ (2013) analysis of unconditionals to ever FRs, so

<sup>39</sup>To be more precise, Hirsch (2016) uses multidominance rather than two syntactic copies. If there is any difference between these two options, it is not essential to the present discussion.

<sup>40</sup>A full semantic and compositional exposition of Hirsch’s proposal would lead us too far astray, as it presupposes solid knowledge of the semantics of conditionals, E-type pronouns, and alternative semantics.

<sup>41</sup>A similar, alternative-based analysis of ever FRs was independently proposed by Condoravdi (2015). Her proposal differs in important details, however, mainly in the way(s) the propositional alternatives are quantified over (“discharged”). An explicit comparison goes beyond the scope of this paper.



that (68-a) and (69-a) share a good deal of their derivational history and semantic implications. The main difference between them is the position where the *wh*-clause is spelled out: ever FRs are spelled out as sisters of D, while unconditionals are spelled out as sisters of Q, with the D position being occupied by an anaphoric (or more precisely E-type) pronoun.

Hirsch (2016) shows that his unconditional-based analysis of ever FRs correctly predicts the ignorance inference (see section 3.1). Let us briefly consider why this is so. Each propositional alternative denoted by the unconditional/ever FR in its Q-position functions as a restrictor of the belief-operator  $\square$ . This implies that for each possible thing that Mary could have cooked, the speaker considers it possible (“believable”) that Mary cooked that thing and conveys that no matter which thing it was, John ate it. This in turn implies that the speaker has *no settled belief* about what Mary cooked, entailing further that she is ignorant about what she cooked.

Hirsch’s analysis is thus tailored to account for the semantics of ignorance free relatives. Nevertheless, as I argued in Šimík (to appear), it stands a good chance of being successfully extended to other ever FR uses. The crucial parameter to be set is the domain quantified over by the necessity operator  $\square$ . In Rawlins’s analysis of unconditionals and Hirsch’s analysis of ever FRs, the domain corresponds to the belief-state of the speaker. However, nothing seems to prevent one from assuming that the domain is a counterfactual one (deriving indifference FRs; see section 3.1), or a non-modal one, such as a set of actual situations in the past (deriving non-modal FRs; see section 3.2). On this view, the different types of ever FRs (ignorance, indifference, non-modal) correspond very closely to the different types of conditionals (which come under various labels, e.g. epistemic, counterfactual, situational, respectively). This typology of conditionals has been very well-known in the literature (see e.g. Declerck & Reed 2001) and stands a good chance to be extended to ever FRs.

## 5 Open issues in the study of free relatives

Over the last 30 years or so, the study of the semantics of free relatives has advanced significantly. As I have tried to illustrate, the accounts that have been developed, esp. what I referred to as the DEFINITE account (of FRs in general), initiated by Jacobson (1995), combined with the variation account (of ever FRs), initiated by Dayal (1997), reach an impressive level of descriptive adequacy with only a small number of unmotivated assumptions. What had to be left out from the present discussion for reasons of space are the fascinating and intricate relations of FRs to related empirical phenomena, including *wh*-questions (Chierchia & Caponigro 2013; Article [*Questions and interrogatives*]), (light) headed relatives (Citko 2004), correlatives (Srivastav 1991; Izvorski 1996; Demirok 2017; Article [*Correlatives*]), transparent free relatives (Grosu 2016), modal existential *wh*-constructions (Šimík 2011), unconditionals (Rawlins 2013; Hirsch 2016), free choice items (Giannakidou & Cheng 2006; Caponigro & Fălăuș 2018), or epistemic indefinites (Lauer 2009; Condoravdi 2015; Article [*Free choice items and modal indefinites*]). The integration of the study of FRs in this broader context proves its importance to the general understanding of the semantics of natural language.

Many issues—empirical and theoretical—remain open. Among the open empirical issues are disagreements on a number of generalizations, which call for more careful empirical and possibly experimental studies. To name just a few: To what extent do universal-like ever FRs pass the universal-quantifier diagnostics such as *almost*-modification and NPI licensing (cf. the disagreement between Jacobson 1995 and Tredinnick 2005)? Are plural sortals in *wh*-phrases (*whatever books*) needed to facilitate non-modal readings of ever FRs (as claimed by Condoravdi 2015) or are singulars (*whatever book*) possible too (as observed here)? Can the variation requirement be satisfied by covariation with individual quantifiers, as claimed by Lauer (2009)? Besides these disagreements, there also are some well-known and uncontroversial observations with no satisfactory explanation. Among these are the various restrictions on the use of *wh*-words and *wh*-phrases in FRs: the general dispreference (or even unacceptability) of complex

wh-phrases in plain FRs (*which book*), as opposed to ever FRs (*whichever book*) (but see Šimík to appear), the apparently universal ban on ‘why’ in FRs, or the “puzzling degraded status of *who*” (as opposed to *whoever*) in English FRs (Patterson & Caponigro 2016). Also worth mentioning is the surprising and apparently universal lack of infinitival FRs (Pancheva Izvorski 2000; Šimík 2010).

On the theoretical side, what remains open is the exact status of the modal inferences and particularly the question to what extent these are semantic/conventional (a lexical property of the ever morpheme) and to what extent they are pragmatic/conversational (a property of the discourse combined with the variation requirement lexically imposed by *ever*). Another question in need of further investigation is whether modality is a necessary part of ever FRs (attributing an indifference inference to whatever seems like a non-modal ever FR—a strategy taken by Tredinnick 2005) or if there are genuine non-modal ever FRs (as assumed by Lauer 2009, Condoravdi 2015, as well as in the present paper). An interesting theoretical program (not discussed here for reasons of space) was initiated by Heller & Wolter (2011) (see also Condoravdi 2015 for an alternative view) and revolves around the question of what constitutes transworld (non-)identity of FR denotation—an important issue underlying the variation requirement in ever FRs. Last but not least, there is still no deeper explanation for the two core (universal?) properties of (ever) FRs: their definiteness<sup>42</sup> and the variation requirement of ever FRs. Concerning the definiteness, the classical answer is probably the one offered by Caponigro (2003), who adopts Dayal’s (2004) stipulation that the iota/sigma-type shift is the only possible one for properties in argument positions. An emerging and promising alternative explanation is that ever FRs—being related to (un)conditionals—are always donkey-anaphoric (Hirsch 2016; Šimík to appear) (this, however, does not readily extend to plain FRs). Concerning the variation requirement, this has long been a stipulation (ever since Dayal 1997). Only recently, some authors (particularly Condoravdi 2015 and Hirsch 2016) have proposed that ever FRs involve the computation of propositional alternatives (like in wh-questions, unconditionals, and focus constructions), which in turn provides a rationale for why multiple FR-denotations must be considered when the ever morpheme is used.

Finally, I would like to point out that the study of ever FRs is likely to profit from future in-depth crosslinguistic investigations. Since the 1990s, there have been isolated studies on various semantic aspects of FRs in various languages. These include (in chronological order) studies on Modern Greek (Iatridou & Varlokosta 1996, 1998; Giannakidou & Cheng 2006; Šimík to appear), Yucatec Maya (Tonhauser 2003), Modern Hebrew (Eilam 2007; Šimík to appear), Mixtec languages (Caponigro et al. 2013), Romanian (David 2014; Caponigro & Fălăuş 2018; Šimík to appear), Ilokano (Collins 2015), Czech (Šimík 2016, to appear), Slovenian (Mitrović 2016), Chuj (Kotek & Erlewine 2016), Telugu (Balusu 2017), Italian (Caponigro & Fălăuş 2018), and Russian, Serbian, and Polish Šimík (to appear). As I tried to show in section 3.3, however, it will be important to consider not just the intralinguistic situation of individual languages (or a comparison with English alone), but also the broader crosslinguistic picture, which is likely to yield new crosslinguistic generalizations, which in turn provide us with important data to be accounted for by any crosslinguistically applicable theory of FRs. An initial investigation presented here (and in Šimík to appear) suggests a surprising twist in the thinking about FRs: while the discussion of modal inferences (and definite-like ever FRs) has dominated the literature on ever FRs, it turns out that non-modal ever FRs might in fact be more basic, in the sense that they seem to be available in all languages considered thus far. Modal ever FRs (involving ignorance and indifference inferences), on the other hand, turn out to be much more restricted.

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<sup>42</sup>See also Kotek & Erlewine (2016) for evidence of genuinely indefinite FRs (in Chuj, Mayan). If these authors are right, we need to take a step back and abandon the assumption that FR-definiteness is universal.

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