

Headless relative clauses and the syntax-semantics mapping: Evidence from Mesoamerica

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1. Introduction

Although much less studied, there's a broad family of embedded full tensed clauses that exhibit a semantic behavior resembling those of DPs: they don't convey propositional content, but rather denote individuals or generalized quantifiers. For instance, the *wh*- clause *what Pablo made* in the sentence *Frida ate what Pablo made* is referring to the food that Pablo made, like the referential DP *the food by Pablo*, even if the clause occurs without a definite article (a D head) or a noun (an N head). Some of these clauses can occur as complements of determiners, which is a position that is usually reserved for NPs. For instance, the string *most that like Pablo* with the underlined full tensed clause following the D *most* denotes the same type of generalized quantifier as the quantificational DP *most people*. We label this family of clauses *headless relative clauses* (henceforth, *[−H]RCs*).

In this paper, we show that the study of the semantic behavior of *[−H]RCs* leads to the new generalization about the syntax-semantics mapping for natural languages in (1).

(1) New generalization about the syntax-semantics mapping in natural languages

Natural languages can systematically use clauses in the form of *[−H]RCs* to denote individuals (including kinds) without any specific morpho-syntactic marking. On the other hand, quantification via any type of *[−H]RC* requires an overt specific morpho-syntactic marker; different kinds of markers can be employed within and across languages.

For instance, the *[−H]RC* *what Pablo made* is a plain *wh*- clause without any extra morpho-syntactic marking and can only be interpreted as referring to the things that Pablo made—like a definite DP. It cannot be equivalent to a quantificational DP like *some/most/all/none of the things that Pablo made*, regardless of the context. On the other hand, a *[−H]RC* like *most that like Pablo* is interpreted as a generalized quantifier of the

same type as the one that is denoted by the quantificational DP *most people*. The presence of an overt morpho-syntactic maker—the D head *most*, in this case—determines the kind of meaning that is assigned to the whole [–H]RC.

We support this new generalization with new findings from a collaborative project that has systematically studied [–H]RCs in fifteen languages from five language families, all from Mesoamerica but one. We also provide a compositional semantic analysis for each of the five main kinds of [–H]RCs we have identified. For some, our analysis is the first ever. For the others, analyses already exist for other languages; we show that our findings are compatible with those analyses and bring further support to them.

To the best of our knowledge, the generalization in (1) holds for and is supported by not only our findings but also the findings about [–H]RCs in all the languages in which they have been investigated so far. Since most of the previous studies have focused on just one kind of [–H]RC in one language, it was difficult for any of them to detect and support the generalization in (1). In our project, instead, we have chosen to investigate all the main varieties of [–H]RCs in a systematic, consistent, and comparable way across languages and language families.

The remainder of the paper is structured as follows. Section 2 briefly introduces our project and the languages we have investigated. Section 3 provides a general definition of [–H]RC. Each of the Sections 4–6 introduces a different kind of [–H]RC, highlights some of the main findings from our crosslinguistic investigation, and provides a semantic analysis for each kind of [–H]RC. Section 7 concludes.

2. Our project and the Mesoamerican languages we have investigated

Previous work on Mesoamerican languages had shown evidence of [–H]RCs (see Caponigro 2021 and reference therein). Our project has investigated [–H]RCs systematically and in depth in fifteen languages, all from Mesoamerica but one. The languages are listed below together with the names of the scholars who investigated them (see Caponigro et al. 2021 for more details and the relevant data):

Mesoamerican–UTO-AZTECAN: *Southeastern Tepehuan (O'dam)*, by Gabriela García Salido; *Tlaxcala Nahuatl*, by Lucero Flores-Nájera. OTO-MANGUEAN: *Acazulco Otomi*, by Néstor Hernández-Green; *Matlatzinca*, by Enrique Palancar and Leonardo Carranza Martínez; *Iliatenco Me'phaa*, by Philip T. Duncan and Harold Torrence; *San Pedro Mixtepec Zapotec*, by Pafnuncio Antonio-Ramos. MAYAN: *K'iche'*, by Telma Angelina Can Pixabaj; *Q'anjob'al*, by Eladio Mateo Toledo; *Chuj*, by Justin Royer; *Ch'ol*, by Juan Jesús Vázquez Álvarez and Jessica Coon; *Tsotsil* and *Tzeltal (Tseltalan)*, by Gilles Polian and Judith Aissen; *Yucatec Maya*, by Scott AnderBois and Miguel Oscar Chan Dzul. MIXE-ZOQUEAN: *Sierra Popoluca*, by Wendy López Márquez.

Non-Mesoamerican–CHIBCHAN: *Pesh*, by Claudine Chamoreau.

Our project has involved twenty-one scholars from Mexico, USA, Canada, and France and two preparatory workshops. The first workshop allowed all the scholars to share and agree on the same definitions of [–H]RCs, the methodology for the data collection, and the template to follow in organizing and presenting the data. The second workshop focused on presenting the data from the fieldwork and providing collective and individual feedback in preparation for the writing of the individual chapters. More details on our project, its structure, and its organization can be found in Caponigro et al. (2021:Preface).

3. Definition of headless relative clauses

We define [-H]RCs as a family of constructions sharing the properties in (2).

(2) *Properties characterizing [-H]RCs:*

- I. They are embedded clauses;
- II. They have an argument or an adjunct missing (it can sometimes be marked by a resumptive pronominal form);
- III. They lack an “external nominal head”—a nominal head that precedes or follows them and is linked¹ to the missing constituent;
- IV. They exhibit the same distribution and interpretation as DPs or PPs.

Examples of [-H]RCs are given in brackets in (3) and (4).

(3) Frida was very friendly with [-H]RC *those* Susana invited from Mexico].

(4) Mercedes lives [-H]RC *where* she was born].

The [-H]RCs in (3) and (4) share the four properties in (2). Both are embedded clauses inside a matrix clause (Property I). Both have a missing constituent, marked by the underscore (Property II): in (3), what is missing the object of the transitive predicates *invited*, while in (4) it is the locative adjunct to the intransitive predicate *was born*. Neither [-H]RC is introduced by a nominal head (Property III): the [-H]RC in (3) is introduced by the italicized demonstrative *those*, which crucially occurs without a nominal complement; the [-H]RC in (4) is introduced by the italicized *wh*-word, which sits in the left peripheral position of the [-H]RC. Last, the [-H]RCs in (3) and (4) have the same distribution and interpretation as the bracketed DP in (5) and the bracketed PP in (6), respectively (Property IV).

(5) Frida was very friendly with [DP the people that Susana invited from Mexico].

(6) Mercedes lives [PP in the place where she was born].

We summarize and further specify the properties in (2) with the syntactic schema in (7a) and the feature bundle in (7b), which we use as a concise device to define the different varieties of [-H]RCs in the next sections as well.

(7) *Summary of the properties characterizing [-H]RCs:*

- a. [(DET) [CP (*wh*-/REL/COMP)]]_{DP/PP}² b. [±D, -N, ±WH]

¹ “Linked” is used here as a general label for any kind of morpho-syntactic (e.g., gender or number agreement) or semantic connection.

² The subscript *DP/PP* occurring at the far right of the syntactic schema in (7a) does not indicate the actual syntactic categories of [-H]RCs, but indicates the distributional similarities of [-H]RCs with actual DPs and PPs.

[−H]RCs have no nominal head (−N). Some have a “light head,” which we have assigned the label Determiner (±D) for convenience and whose nature we shall discuss later. [−H]RCs can feature a *wh*-expression³ (*wh*-) from the set of those introducing *wh*-interrogative clauses with possible extra morphological marking (±WH), a non-*wh* relativizer (REL) of the same kind as those introducing headed relative clauses (including non-*wh* relative pronouns), a general complementizer (COMP) of the same kind as those introducing complement clauses (and maybe headed relative clauses too), a combination of those, or no marking at all. All [−H]RCs have a missing constituent (_).

Despite the similarities highlighted in (2), [−H]RCs exhibit differences in interpretation, distribution, and/or morpho-syntactic properties that are discussed in the next sections. Overall, the label “headless relative clauses ([−H]RCs)” should be taken as a way to identify not just one single construction, but a cluster of related constructions, and to distinguish them from another cluster of related but different constructions—headed relative clauses. In particular, we have identified three main varieties of [−H]RCs: *free relative clauses*, *light-headed relative clauses*, and *super-free relative clauses*. In the next sections, we discuss each kind of [−H]RC in turn, highlighting the main criteria that we used to identify them. We also introduce further distinctions within each kind. Free relative clauses are discussed next (Section 4), then light-headed relative clauses (Section 5), and finally super-free relative clauses (Section 6).

Table 1 shows that the different varieties of [−H]RCs are all extremely productive in the languages we have investigated.

Table 1. Productivity of varieties of [−H]RCs in the languages under investigation⁴

	UTO-AZT		OTO-MANGUEAN				MAYAN						MI-ZO	CHI
	Te	Na	AO	Ma	IM	SZ	K'	Q'	Cj	Cl	TT	YM	SP	Pe
Max	√	√	√	√	√	√	√	√	√	√	√	√	√	√
FR Ex	√	√	√	√	√	√	√	√	√	√	√	√	√	√
FC	*	√	√	√	√	√	√	√	√	?	*	√	√	√
LHR	√	√	√	√	√	√	√	√	√	√	√	√	√	√
SFR	*	√	*	√	√	√	√	?	√	?	?	?	√	√

NOTE: **Marks:** √: attested; *: not attested; ?: unclear if attested.

³ We use the term *wh-expression* to refer both to a single *wh*-word occurring on its own (e.g., *who*, *where*, *when*, etc.) as well as to a *wh*-phrase that consists of a *wh*-word and other material, like a complement (e.g., *what book*, *how much food*) or a preposition (e.g., *by means of what*, *with which friend*) or both (e.g., *together with how many other people*).

⁴ Abbreviations in Table 1. **Language family names:** UTO-AZT: Uto-Aztecan; MI-ZO: Mixe-Zoquean; CHI: Chibchan. **Language names:** Te: Southeastern Tepehuan; Na: Tlaxcala Nahuatl; AO: Acapulco Otomi; Ma: Matlatzinca; IM: Iliatenco Me'phaa; SZ: San Pedro Mixtepec Zapotec; K': K'iche; Q': Q'anjob'al; Cj: Chuj; Cl: Ch'ol; TT: Tsotsil and Tsel'tal; YM: Yucatec Maya; SP: Sierra Popoluca; Pe: Pesh. **Constructions:** FR: free relative clause; Max: maximal free relative clause; Ex: existential free relative clause; FC: free-choice free relative clause; LHR: light-headed relative clause; SFR: super-free relative clause.

4. Free relative clauses

We use the label *free relative clauses* (henceforth, *FRs*) for those $[-H]$ RCs that have no D head and are introduced by (a subset of) the *wh*-expressions in *wh*-interrogative clauses, with or without extra morpho-syntactic marking. In some of our languages, the *wh*-expression may co-occur with a complementizer. The characterizing features of FRs are summarized by the syntactic schema in (8a) and the feature bundle in (8b).

(8) *Properties characterizing FRs:*

- a. $[_{CP} \textit{wh-} (\textit{COMP}) \dots __ \dots]_{DP/PP}$ b. $[-D, -N, +WH]$

The bracketed string we saw in (3) above is an example of an FR in English that is introduced by the *wh*-word *where*. All three main varieties of FRs that are attested crosslinguistically occur in our languages as well: maximal free relative clauses, existential free relative clauses, and free-choice free relative clauses. The crucial distinction is semantic in nature. This distinction often correlates with morpho-syntactic differences as well.⁵ We discuss and exemplify each variety of FR in turn in Sections 4.1–4.3.

4.1 Maximal free relative clauses

Maximal free relative clauses (Max-FRs) are those FRs that satisfy the properties in (9).

(9) *Properties characterizing Max-FRs:*

- a. DEFINITENESS. A Max-FR can be replaced and paraphrased by a definite DP—a DP introduced by a definite marker or determiner in a language that has them, like *the* in English—or by a PP with a definite DP as its complement.
- b. REFERENTIALITY. A Max-FR is interpreted as referential: it refers to an individual. In this respect, Max-FRs are like proper names, definite DPs, and DPs introduced by demonstratives.
- c. MAXIMALITY: A Max-FR is interpreted as maximal: it refers to the largest (‘maximal’) individual of a set of individuals. This is the same semantic behavior as seen with definite DPs.

Examples of Max-FRs are given in brackets in (10a) and (11a) with the *wh*-words introducing them in bold.

- (10) a. Paloma revised [_{Max-FR} **what** Frida wrote $__$].
 b. Paloma revised [_{Definite DP} the thing(s) Frida wrote].

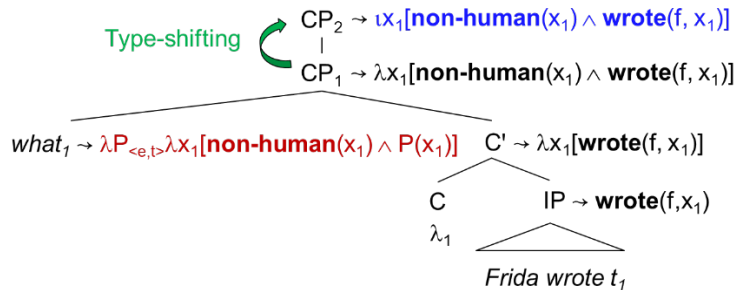
- (11) a. I went [_{Max-FR} **where** my friends are vacationing $__$].
 b. I went [_{PP to} [_{Definite DP} the place(s) my friends are vacationing]].

⁵ See Šimík (2017, 2020) for a thorough overview of the semantic properties of FRs and the analyses that have been suggested, and van Riemsdijk (2017) for a detailed overview of their syntactic properties and related syntactic proposals. Caponigro et al. (2013) investigate FRs in two Mixtec languages following a paradigm similar to ours.

The Max-FRs in (10a) and (11a) satisfy the “Definiteness” property in (9a): they can be replaced and paraphrased with definite DPs, as shown in (10b) and (11b). They also satisfy the “Referentiality” property in (9b): the Max-FR in (10a) refers to the object(s) Frida wrote and the Max-FRs in (11a) to the place(s) where the speaker’s friends are on vacation. Notice that referentiality is also a semantic property of the definite DPs that replace the Max-FRs in (10b) and (11b). Last, the Max-FRs in (10a) and (11a) exhibit the “Maximality” property in (9c). If Frida wrote a novel, a short story, and a poem, the Max-FR in (10a) refers to the maximal plural individual that results from the sum of those three atomic individuals. Crucially, it cannot refer to anything smaller than that—such as the atomic individual consisting of the poem or the non-maximal plural individual made up of only the poem and the short story. This is the same semantic behavior as found with the plural definite DP *the writings by Frida*. Notice that the Max-FR in (10a) cannot be interpreted as triggering quantification over a set of individuals, unlike the indefinite DP *some of the things Frida wrote*. Similarly, the Max-FR in (11a) has to refer to the maximal place resulting from the sum of all the individual places where the speaker’s friends are on vacation—a semantic behavior like the PP *to the places where my friends are vacationing* (with a definite DP as its complement) and unlike the PP *to some of the places where my friends are vacationing* (with an indefinite DP as its complement).

This semantic view of Max-FRs is based on Jacobson (1995), Dayal (1996), and Caponigro (2003, 2004). According to this approach, the Max-FR in (10a) receives the compositional semantic analysis in (12).

(12) *Semantic derivation of the Max-FR in (10a):*



The IP of a Max-FR and, as we’ll see, of an FR in general, denotes an open proposition with the free variable x_1 introduced by the *wh*-trace. The familiar lambda abstraction over a *wh*- variable occurs at the level of C', which ends up denoting a set of individuals—all and only the individuals that Frida wrote. The *wh*-word *what*, acting as a set restrictor, applies to the set of individuals that Frida wrote and returns its non-human subset—the denotation of CP₁. A type mismatch now occurs. The Max-FR (CP₁) denotes a set of individuals, while the matrix predicate *write* selects for an individual-denoting direct object. A general meaning-preserving type-shifting operation is assumed to apply and turn the denotation of CP₁ into the maximal individual of the set of non-human individuals that Frida wrote—the final denotation of the Max-FR (CP₂).

Max-FRs are extremely productive in all the Mesoamerican languages we have investigated (see the highest row in Table 1) and, in each language, they make use of most of the *wh*-words (see Caponigro 2021 for details). Pesh, the only non-Mesoamerican

language we have investigated, is also the only language with a non-productive system of Max-FRs: only the *wh*-word for ‘when’ introduces Max-FRs.

K'iche' and San Pedro Mixtepec Zapotec enrich the *wh*-words introducing Max-FRs with extra morpho-syntactic marking, like Modern Greek and Hungarian. K'iche' adds what looks identical to a definite determiner, *le*, right after the *wh*-word (13).

- (13) X-ki-muli-jk-iib' [**jachin taq le** k-e-xajow-ik].⁶ K'iche'
 COMPL-A1PL-gather-ACTA1PL-RECP **who** PL DET ICP-B3PL-dance-SS
 ‘The ones who dance, gathered.’

Definite determiners must precede nominals in K'iche'. Can Pixabaj (2021) leaves it open whether the definite D occurring with *wh*-words in Max-FRs is a syntactically independent D head or a suffix combining with the *wh*-root (and other suffixes). San Pedro Mixtepec Zapotec, instead, makes use of what is clearly a prefix, *tèl-*, to characterize the *wh*-words in Max-FRs (14). This prefix doesn't resemble any other marker in the language.

- (14) d-áw ná [**tèl-pè** b-dziěł]⁷ San Pedro Mixtepec Zapotec
 COMPL-eat 1SG TEL-WH.INAN COMPL-find
 ‘I ate what was found.’

These facts provide indirect support to the type-shifting rule that is assumed in the semantic derivation in (12). The meaning of a Max-FR has to shift from a set to its maximal individual: this meaning shift is triggered either lexically or by general type-shifting rules that deal with type mismatches. The first option requires the language to have an overt lexical item/morpheme that (i) conveys the correct type-shifting operator and (ii) can morpho-syntactically combine with the whole FR (a CP) or its *wh*-word. K'iche' and San Pedro Mixtepec Zapotec have such a lexical item or morpheme. This lexically triggered option, though, is the least common among our languages; the default is the free application of the appropriate type shifter without overt lexical marking. This fact mirrors and supports previous findings about Max-FRs in non-Mesoamerican languages.

4.2 Existential free relative clauses

Existential free relative clauses (henceforth, *Ex-FRs*) are those FRs satisfying the semantic and syntactic properties in (15a,b).⁸

⁶ From Can Pixabaj (2021:ex. 40). The abbreviations in the glosses of this example and all the others follow “The Leipzig Glossing Rules—List of Standard Abbreviations, Updated on May 31, 2015”. We refer to the source of the examples for the explanation of further abbreviations that individual authors may have used.

⁷ From Antonio-Ramos (2021:ex. 48d).

⁸ See Šimík (2011) and work cited there. Šimík (2017) provides a thorough review of the relevant literature on Ex-FRs and related constructions. We assume that they are clauses (CPs). Grosu (2004) and Šimík (2011) argue that Ex-FRs should not even be called FRs because they are not necessarily clauses. They propose the label *Modal Existential Construction (MEC)*, instead.

(15) *Properties characterizing Ex-FRs:*

- a. EXISTENTIAL MEANING. Ex-FRs can be replaced and paraphrased by existentially quantified nominal expressions that are introduced by indefinite markers (indefinite DPs) or by bare nominals, in languages that allow for either.
- b. EXISTENTIAL PREDICATE. When attested in a language, Ex-FRs can always occur as the complement of existential ‘be’ and existential ‘have’ in that language.

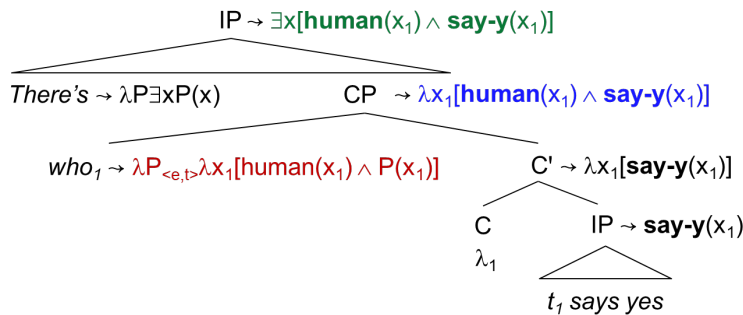
Ex-FRs are not attested in English or other Germanic languages, but are common in Romance, Balto-Slavic, and Semitic languages, as well as our languages. An example of an Ex-FR from Italian is given in brackets in (16a).

- (16) a. C’è [_{Ex-FR} **chi** dice sempre sì].
 there’s who say.IND.PRS.3SG always yes
 ‘There are people who say yes all the time.’
- b. Ci sono [_{Indefinite DP} delle persone che dicono sempre sì].
 there are some people that say. IND.PRS.3PL always yes
 ‘There are people who say yes all the time.’

The Ex-FRs in (16a) satisfies the properties in (15a,b). Example (16b) shows that the Ex-FR can be replaced and paraphrased with an existentially quantified DP, as required by the “Existential Meaning” property in (15a). For instance, (16a) asserts the existence of at least one person who says yes all the time. In other words, the set of the people who say yes all the time is non-empty. The Ex-FR is, therefore, semantically close to the indefinite DP in (16b).

Although with significant variants, all the semantic analyses that have been suggested for Ex-FRs agree that the existential force of an Ex-FR is crucially related to the matrix predicate. In (17), we sketch the semantic derivation of the Ex-FR in (16a), following Caponigro (2003, 2004).

(17) *Semantic derivation of the Ex-FR in (16a):*



The semantic derivation of an Ex-FR is identical to the one of a Max-FR up to CP (CP₁ in a Max-FR): the CPs in both FRs denote a set of individuals. The crucial difference is the assumption that there’s no type mismatch between an Ex-FR and its matrix predicate. An existential predicate (*there’s* in (17)) selects for a set-denoting complement and

existentially quantifies over it, as shown by the logical translation of the top-most IP in (17).

Ex-FRs are extremely productive in all the languages we have investigated (see the second-highest row in Table 1) and, in each language, they make use of most of the *wh*-words (see Caponigro 2021 for details). Four of our languages—Southeastern Tepehuan, Tlaxcala Nahuatl, Acazolco Otomi, and Matlatzinca—impose a mood restriction on their Ex-FR: an irrealis form or marker is required. This restriction correlates with Šimík’s (2011) findings that most of the languages he surveyed require the predicate of an Ex-FR to be in the infinitive or subjunctive form, although the Italian example in (16a) exhibits plain indicative morphology. Crucially, the remaining eleven languages we have investigated don’t exhibit any TAM (Tense/Aspect/Mood) restriction in their Ex-FRs either, bringing further evidence that the pattern previously found in Italian is not an anomaly. For instance, both the predicate of the bracketed Ex-FR in the example in (18) from San Pedro Mixtepec Zapotec and the predicate of the bracketed Ex-FR in (19) from Yucatec Maya carry a completive aspect affix (in bold) without any modal component.

(18) y-ō [pè p-kà Màrí].⁹ *San Pedro Mixtepec Zapotec*
 STAT-exist WH.INAN **COMPL**-buy María
 ‘There is something that María bought.’

(19) Yaan [ba'axten t-u meet-**aj**].¹⁰ *Yucatec Maya*
 EX why PFV-A3 do.TR-SS.**CPLV**
 ‘There is a reason why he did it.’

4.3 Free-choice free relative clauses

Free-choice free relative clauses (henceforth, *FC-FRs*) are those FRs that satisfy the properties in (20a,b).¹¹ Examples are given in (21) and (22).

(20) *Properties characterizing FC-FRs:*

- a. FREE-CHOICE INFERENCE. A sentence containing an FC-FR obligatorily triggers an inference of ignorance or indifference.
- b. FREE-CHOICE MARKER. An FC-FR always contain a free-choice (FC) marker.

(21) a. [FC-FR **Whatever** Paloma is cooking right now] uses onions.¹²
 b. *Asserted content:* [_{Max-FR/DP}{What}/{The stuff that} Paloma is cooking right now] uses onions.
 c. *Ignorance FC inference:* The speaker doesn’t know what Paloma is cooking right now.

⁹ From Antonio-Ramos (2021:ex. 55).

¹⁰ From AnderBois & Chan Dzul (2021:ex. 23c).

¹¹ See Dayal (1997) and von Stechow (2000). Also, see Šimík (2020) for an overview of the relevant issues and literature. FC-FRs in English (and in other languages as well) are often labeled “*-ever* free relative clauses”.

¹² Adapted from Dayal (1997:ex. 27a).

- (22) a. Pablo (simply) voted for [_{FC-FR} **whoever** was at the top of the ballot].¹³
 b. *Asserted content*: Pablo voted for [_{DP} the person who was at the top of the ballot].
 c. *Indifference FC inference*: Pablo didn't care about who was at the top of the ballot.

Example (21a) shows a bracketed FC-FR in the subject position of its matrix clause. It is introduced by the bolded *wh*-word *whatever*, which results from the morphological enrichment of the *wh*-root *what* with the FC suffix *-ever*. Following Dayal's (1997) seminal analysis for English and von Stechow's (2000) further development, the meaning contribution of the FC-FR in (21a) manifests itself at two different levels. The asserted content of (21a) is the same as the one of (21b), in which the FC-FR has been replaced with a Max-FR or a definite DP. The FC-FR in (21a), though, obligatorily triggers the ignorance inference (a presupposition, according to von Stechow) that the speaker doesn't know the identity of what Paloma is cooking, as stated in (21c). Notice that both the Max-FR and the definite DP in (21b) are compatible with a situation in which the speaker doesn't know the identity of what Paloma is cooking, but, crucially, they are also compatible with a situation in which the speaker is fully knowledgeable about what Paloma is cooking. In other words, they do not obligatorily trigger an ignorance inference.

Example (22a) shows a bracketed FC-FR in the complement position of the preposition *for* in the matrix clause. It is introduced by the morphologically enriched *wh*-word *whoever* in bold. Example (22a) asserts the same as (22b), in which the FC-FR has been replaced with a definite DP. Unlike (22b), though, (22a) with an FC-FR necessarily triggers the indifference inference that Pablo doesn't care about the actual identity of the candidate at the top of the ballot, as stated in (22c).

We group these two inferences under the same “free choice” label to highlight the fact that they both trigger a form of variation. An FC-FR does refer to a maximal individual, like a Max-FR, but which maximal individual it refers to can vary depending on the relevant modality and the related modal agent: epistemic modality and the speaker in (21), or counterfactual modality and Pablo—the individual the matrix subject refers to—in (22). It is a parameter of crosslinguistic variation whether both inferences are triggered in FC-FRs or only one—and, if only one, which one (see Caponigro & Fălăuş 2018).

FC-FRs are attested in all the languages we have investigated but Southeastern Tepehuan (O'dam), Tsotsil, and Tzeltal, as shown in the middle row in Table 1 (see Caponigro 2021 for further details). The languages with FC-FRs mark them by means of FC markers preceding (F+) or following (+F) *wh*-words, as shown in (23) with the bolded FC suffix in Tlaxcala Náhuatl.

- (23) Ø-miki-s [ak-**sa** i-nawa-k ti-mo-namik-ti-s]¹⁴ *Tlaxcala Náhuatl*
 S3-die-IRR who-FC POSS3SG-ear-LOC S2SG-RR-find-CAUS-IRR
 ‘Whoever you get married to will die.’

Only Pesh uses reduplication of *wh*-words to mark FC, as shown in (24).

¹³ Adapted from von Stechow (2000:ex. 18).

¹⁴ From Flores-Najera (2021:ex. 50).

- (24) *írírí tàkàtùhúmà ápáhá?*¹⁵ Pesh
 [ĩ=ra ĩ=ra ta-ka-tuh-u-wa=ma] Ø-ã-pa=hã?
 DEM.PROX=ABS DEM.PROX=ABS OBJ1-APPL.R-cook-SBJ2-PRS=CRT OBJ3SG-eat- SBJ1SG.FUT=FOC
 ‘I will eat whatever you cook for me.’

Further research is needed to establish which inferences FC-FRs trigger in each language and their exact nature. What is crucial for our assessment of the syntax-semantics mapping generalization in (1) is that neither kind of inference is obligatorily triggered without overt morpho-syntactic marking: an FC marker of some kind is needed.

5. Light-headed relative clauses

Light-headed relative clauses (henceforth, *LHRs*) are [–H]RCs with an overt D head that can co-occur with a *wh*-expression, a relative marker, a complementizer, or no marker at all.¹⁶ The characterizing features of LHRs are summarized by the syntactic schema in (25a) (inspired by the syntactic analysis in Citko 2004) and the feature bundle in (25b).

- (25) *Properties characterizing LHRs:*
 a. [D [CP (*wh*-/REL/COMP) ___ ...]]_{DP/PP} b. [+D, –N, ±WH]

D heads in LHRs can be of three main kinds, though they are not necessarily all instantiated in all languages with LHRs: articles, demonstratives, or quantifiers. An examples of LHR introduced by a demonstrative D in English was given in (3), while (26) and (27) provide examples of LHRs that are introduced by quantificational Ds from two of our languages.

- (26) [_{LHR} **Tuláakal** k-u púuts'-ul-o'ob], k-u y-áalkab-Ø-o'ob.¹⁷ *Yucatec Maya*
 all IPFV-A3 flee-SS.ICPLV-B3PL IPFV-A3 EP-run-SS.ICPLV-B3PL
 ‘All those who escape run (from him).’
- (27) Xtáa [_{LHR} **mbá-a** tsí ndá-'-ñ-áa].¹⁸ *Iliatenco Me'phaa*
 exist.AN INDF-AN COMP.AN IPFV-3SG-see.APPL-2SG
 ‘There is someone looking for you.’

Overall, LHRs are extremely productive across the languages we have investigated, as shown in the second-lowest row in Table 1. The picture that emerges from our investigation depicts LHRs as a family of constructions, rather than just a single construction. Across languages and even within the same language, there may be LHRs whose morpho-syntax is closer to that of [–H]RCs or headed relative clauses or neither. The details about our findings can be found in Caponigro et al. (2021), including the data about which kind of D head can introduce an LHR in which language.

One of the main goals of this paper is to test the syntax-semantics mapping generalization in (1). Therefore, the semantic behavior of LHRs is crucial for us. Our

¹⁵ From Chamoreau (2021:ex. 58).

¹⁶ We borrow the label “light-headed relative clauses” from Citko (2004), although we expand its coverage by also including constructions that lack *wh*-expressions.

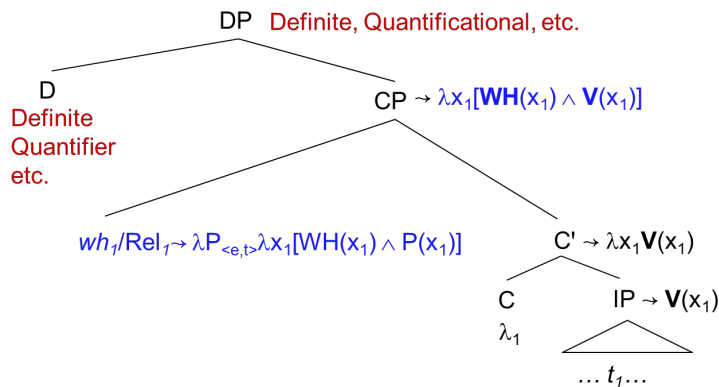
¹⁷ From AnderBois & Chan Dzul (2021:ex. 33b).

¹⁸ From Duncan & Torrence (2021:ex. 64b).

findings show that it is the D of an LHR that determines the kind of meaning that the whole LHR conveys. If the D head is a definite or demonstrative D, then the LHR behaves like a referential DP. If the D head is a quantifier, then the LHR behaves like a quantificational DP with the same quantificational strength as its D head.

We are not aware of any compositional semantic analysis of LHRs.¹⁹ We tentatively sketch one in (28) that accounts for our empirical findings and our generalization. If an LHR has an overt lexical item licensing a *wh*-trace/variable (may it be a *wh*-expression or a non-*wh* relative pronoun), then its semantic derivation and contribution up to its CP are the same as those of an FR: a subset of individuals resulting from the restriction (WH) that the *wh*-word wh_1 or the relative pronoun Rel_1 imposes on the set of individuals that is denoted by C' after abstracting over the *wh*-variable licensed by wh_1 (V stands for whatever 1-place predicate results from the semantic derivation of the LHR up to its IP). The D head is looking for a set-denoting complement to return either an individual, if D is a definite article or a demonstrative, or a generalized quantifier, if D is quantificational. If an LHR lacks a *wh*-word or a relative pronoun, then its semantic derivation will be the same as the one of an FR up to C' included. The meaning of C' will be passed up to its mother node CP and then combine with the meaning of the D head, without the extra semantic contribution in blue in (28).

(28) *Semantic derivation of LHRs with a wh-word or a relative pronoun:*



6. Super-free relative clauses

Super-free relative clauses (henceforth, *SFRs*) are the last variety of $[-H]$ RCs that we have investigated. Like all $[-H]$ RCs, they lack an N head. Unlike LHRs, they lack a D head as well, resembling FRs in this regard. But they are even “freer” than FRs in lacking a *wh*-expression as well. The syntactic structure we assume for SFRs is summarized in (29a) and their main features are bundled in (29b).

(29) *Properties characterizing SFRs:*

- a. $[CP (REL/COMP) \dots _ \dots]_{DP/PP}$ b. $[-D, -N, -WH]$

¹⁹ While presenting this paper at SULA 11, Scott AnderBois (p.c.) informed me that he had started working on a compositional semantics of LHRs and had presented some preliminary results in a lecture at CIESAS on July 13, 2020.

SFRs have been largely ignored in the literature; our study is the first one to precisely define and investigate them. Our findings show that SFRs are well-attested in our languages (see the lowest row in Table 1). Eight of our languages clearly have SFRs, while two clearly don't. The remaining five (those with a question mark in the lowest row in Table 1) have constructions that look like SFRs, but the scholars who have investigated them have left the issue open whether they are true [-H]RCs or headed relative clauses with a silent nominal head (see the relevant language-specific chapters in Caponigro et al. 2021 for relevant data and discussion).

Morpho-syntactically, SFRs can be introduced by a complementizer, as in (30), or by a non-*wh* relative pronoun, as in (31), or by no marker at all, as in (32) and (33). Crucially, the bracketed SFRs in (30)–(33) are full, tensed clauses, rather than nominalized tenseless clauses or subclausal constituents.

- (30) y=o-Ø-asi-ko [SFR **den** i-pampa o-ti-choka-ya]²⁰ *Tlax. Náhuatl*
 already=PST-S3-arrive-VEN.PST COMP POSS3SG-RSN PST-S2SG-cry-IPFV
 ‘The one you cried for has already arrived.’
- (31) Ø=**ʔit-wi** [SFR ta=kuʔaʔm-ket-neʔ-wi=**pVʔ**]²¹ *Sierra Popoluca*
 3ABS=be-COMPL 1ABS:INCL=search-descend-PERF-COMPL=REL
 ‘There is someone who looks after us.’
- (32) **Ay-Ø** [SFR max-Ø w-aq'-ok-toq y-ul refri]²² *Q'anjob'al*
 EXS-B3 COM-B3 A1SG-give-DIR-DIR A3-in fridge
 ‘There is some [chicken] that I put into the fridge.’
- (33) no tata, cha' phi [SFR gahch'ówi chhan tu hēwi]²³ *Matlazinca*
 no sir NEG be.so 2PLPRO 2PL.AMBU INFL do
 ‘No sir, what you (pl) are doing is not good.’

Semantically, SFRs across our languages are interpreted as referential and maximal by default, as shown in (30) and (33). If a language allows SFRs to occur as the complement of existential predicates, then they are interpreted as existential quantified, as shown in (31) and (32). There are languages that only allow SFRs as the complement of existential predicates: all our Mayan languages but Ch'ol behave this way, as shown in (32) for Q'anjob'al.

This consistent semantic behavior of the same construction across languages and language families cannot be by chance and fully supports our generalization in (1). We propose to account for it as in (34). The two semantic derivations in (34) share the same steps all the way up to CP₁. This is also the very same semantic derivation as the one for LHRs without *wh*-word in Section 5. CP₁ denotes a set of individuals in all these constructions. If an SFR occurs in a typical argument position in which an individual-denoting constituent is required, then a type mismatch occurs. It is the same type mismatch as the one we already discussed for Max-FRs. Therefore, we adopt the same

²⁰ Adapted from Flores-Nájera (2021:ex. 66).

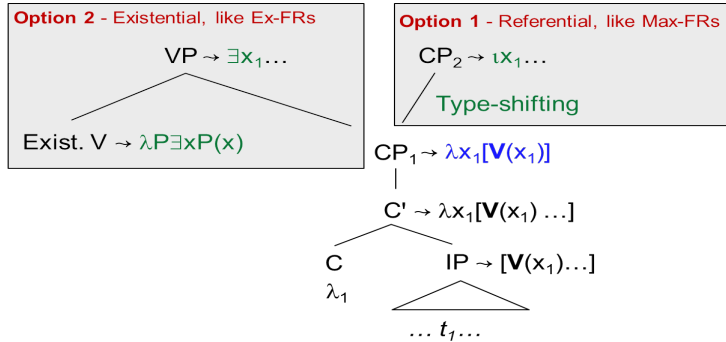
²¹ Adapted from López Márquez (2021:ex. 89b).

²² Adapted from Mateo Toledo (2021:ex. 67).

²³ Adapted from Palancar & Carranza Martínez (2021:ex. 58).

strategy to handle it: the same type-shifting rule applies and turns the set denoted by CP_1 into its maximal individual, as shown by Option 1 in (34). On the other hand, if an SFR occurs in the complement position of existential predicates like those we discussed for Ex-FRs, then the very same semantic process we proposed for Ex-FRs applies to these SFRs as well: the matrix predicate existentially quantifies over its set-denoting complement, as shown by Option 2 in (34).

(34) *Semantic derivations of SFRs:*



7. Conclusions

We have proposed the new generalization about the syntax-semantics mapping in (1), according to which the interpretative options for $[-H]RCs$ are highly restricted. We have supported this generalization with novel findings from our crosslinguistic investigation of $[-H]RCs$ in fifteen languages, all Mesoamerican but one. We have also provided definitions and semantic analyses for each of the main kinds of $[-H]RCs$ that we have identified. Our proposals for the three different kinds of FRs build on definitions and analyses that have been proposed for mainly Indo-European languages. Our proposals for LHRs and SFRs, instead, are the first general definitions and semantic analyses of those kinds of $[-H]RCs$ that we are aware of. All the proposals rely on a small set of shared assumptions that have been independently argued to be needed in the grammar. Last, our generalization and analyses make clear predictions that we bring to the attention of the linguistic community for further testing: no language should be found in which $[-H]RCs$ with no overt quantificational marker can be interpreted as quantificational expressions.²⁴

²⁴ Gitksan (Tsimshianic) as presented in Aonuki (to appear) may look like a possible counterexample. FRs without any special marking are claimed to be interpretable as indefinites in any argument position, not just as complements of existential predicates. On the other hand, it has emerged from a follow-up conversation with Yurika Aonuki, that the *wh*-words that introduce FRs in Gitksan can also be used on their own, without introducing an FR. In this absolute use, they are always interpreted as indefinites (e.g., the *wh*-word for ‘who’ means ‘someone’ when used on its own). Therefore, “indefinite” FRs could just be headed (or light-headed) relative clauses with an indefinite *wh*-word as their head. Further investigation is needed to determine which hypothesis is correct.

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