

Higher-order quantification outside questions: The case of free relatives*

Luis Alonso-Ovalle

McGill University

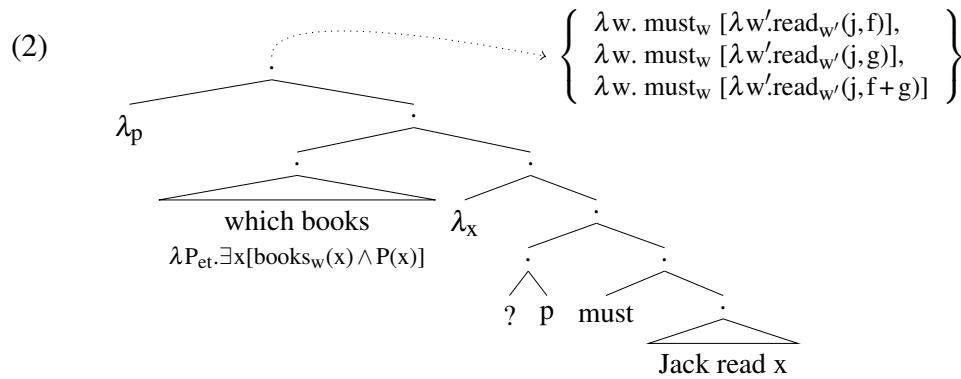
1. Introduction

What kind of semantic objects do *wh*-phrases range over? Entities? Semantic objects of a higher type? There is some evidence that interrogative *wh*-phrases can range over generalized quantifiers. The evidence comes from the interpretation of questions with modals (Spector 2007, 2008) and with collective predicates (Xiang 2021), and from the interpretation of simplex interrogative *wh*-phrases in languages where they inflect for number (Elliott and Sauerland 2019, Elliott et al. 2022, Alonso-Ovalle and Rouillard 2019, 2023). One can observe, for instance, as in Spector 2008, that, in the situation sketched in (1a), the disjunction in (1c) can provide a total answer to the question in (1b).

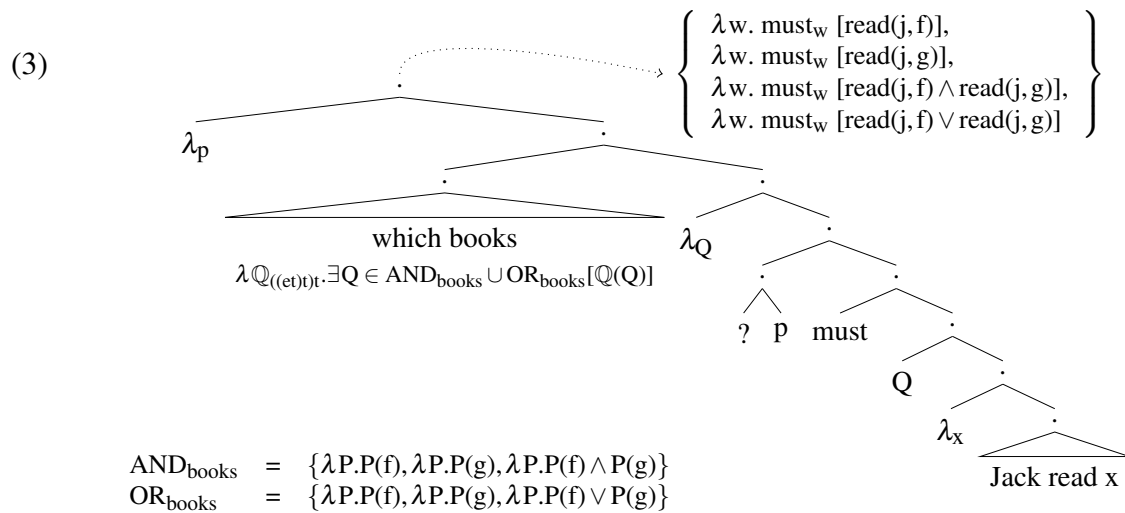
- (1) a. *Scenario 1*. Jack has to read some books. He has a choice, though. At stake: which books he can choose from.
b. Which books must Jack read?
c. The French or the Russian novels. (Spector 2008:677)

That (1c) can provide a complete answer to (1b) would be unexpected if the *wh*-phrase ranged over entities only, for, in that case, as illustrated in (2), any proposition in the Hamblin set of the question would convey that Jack is required to read some books, contrary to the contextual assumption that he is not.

*Thanks to the very insightful anonymous NELS reviewers and to the members of the conference audience, in particular Amir Anvari, Patrick Elliott, Filipe Hisao Kobayashi, Danny Fox, and Uli Sauerland—apologies to others whose questions I may have forgotten. Thanks also to the participants at my McGill seminar on free relatives, including Bernhard Schwarz, Esmail Moghiseh, and Jonny Palucci. The Social Sciences and Humanities Research Council of Canada provided financial support through Insight Grant *Modality across Categories: Modal Indefinites and the Projection of Possibilities* (435-2018-0524).



The appropriateness of the answer in (1c) is however expected if the *wh*-phrase ranges over generalized quantifiers, as in (3), because, in that case, when the trace of the *wh*-phrase scopes under the modal, one of the propositions in the Hamblin set, the one that corresponds to interpreting the trace of the *wh*-phrase as a disjunction, does not convey that Jack is under the obligation of reading some particular set of books.



Beyond questions, we find *wh*-phrases in so-called ‘free relatives’, clausal constituents like the English ones below that can function as Determiner Phrases, Prepositional/Adverbial Phrases, or Adjective Phrases.

- (4)
- [_{DP} *What(ever)* Peter proposed] sounded right.
 - [_{DP} *Whichever plan* Peter proposed] sounded right.
 - I will go [_{PP} *where(ever)* they need me].
 - I will read the paper [_{ADVP} *how(ever)* it needs to be read].
 - Peter is [_{ADJP} *what(ever)* John takes French movies to be].

In many languages, free relatives are formed with *wh*-morphology: in some, like English, the plain *wh*-words in free relatives are morphologically identical to interrogative words; in other languages, like Slovenian, the *wh*-phrases in free relatives are identical to

quantifiers or pronouns that are *derived* from interrogative words and head certain relative clauses, called ‘light-headed’ (Šimik 2021).

We have seen that *wh*-phrases can range over generalized quantifiers in questions. This paper asks whether *wh*-phrases can also range over generalized quantifiers outside questions, in free relatives, and presents evidence, parallel to the question data presented in Spector 2008, that they can.

The paper is organized as follows. Section 2 provides some minimal background on the interpretation of free relatives. In parallel to Spector’s argument, Section 3 shows that free relatives containing modal expressions pose a challenge to the view that these constituents always range over entities. Section 4 shows that the attested interpretation is captured if free relatives range over generalized quantifiers. We will illustrate with Spanish, a language that forms free relatives productively with *wh*-phrases, some of which (*quien(es)* ‘who’) have been argued to range over generalized quantifiers in questions (Alonso-Ovalle and Rouillard 2019, 2023). As far as I can tell, however, the main observation carries over to English. Section 5 excludes a few alternative ways of capturing the data. Section 6 concludes with some questions for further research.

2. Two parses for free relatives

In the literature, we find two parses of free relatives—‘maximal’ and ‘existential.’ Under their ‘maximal’ parse, free relatives are analyzed as definite descriptions, as in the LF in (6) of the free relative in (5) (cf. Jacobson 1995, Caponigro 2003).

- (5) Ana habló [FR con quien habló Bea]
 Ana talked-to-3S with whom talked-to-3S Bea
 ‘Ana talked to the people that Bea talked to.’

- (6) LF: [FR the who λ_x Bea talked to x]

In the version of the definite description analysis that I am adopting in (6), the *wh*-phrase *who* ranges over the set of people in the world of evaluation (7a) and its sister over the set of entities that Bea talked to (7b). These two constituents compose intersectively and feed a covert definite article, with standard maximal semantics: the definite article presupposes that the set that it combines with is ordered and that the order has a maximal element (7c), and, when this is the case, the definite article yields that element as its semantic value.¹

¹In (7c), ‘ $\max_{\sqsubseteq}(X)$ ’ refers to the set in (i), the set of maximal elements in the part-whole ordering on X referred to by ‘ \sqsubseteq ’. The set in (i) is either empty—if there is no maximal element, because X is empty or the ordering is not connected in X —or a singleton—if there is a maximal element, there is only one, given the antisymmetry of the part-whole ordering—hence the definite description in the value of the function in (7c).

(i) $\max_{\sqsubseteq}(X) = \{x : x \in X \wedge \forall y[y \in X \rightarrow y \sqsubseteq x]\}$

- (7) a. $[[\text{who}]^w = \lambda x. \text{people}_w(x)$
 b. $[[\lambda_x \text{Bea talked to } x]^w = \lambda x. \text{talked-to}_w(x)(b)$
 c. $[[\text{the}] = \lambda X : \max_{\sqsubseteq}(X) \neq \emptyset. \text{the } x \in \max_{\sqsubseteq}(X)$

To illustrate, suppose, for instance, that the set of people in the world of evaluation w_0 that Bea talked to is as in (8a)—that it contains Carla, Dalia, and their sum. This set has a maximal element, the sum of Carla and Dalia, so it is in the domain of the denotation of the definite article. The denotation of the whole free relative in this case is the sum of Carla and Dalia, as illustrated in (8b).

- (8) a. $[[\text{who } \lambda_x \text{Bea talked to } x]^{w_0} = \{\text{carla, dalia, carla + dalia}\}$
 b. $[[[\text{FR the who } \lambda_x \text{Bea talked to } x]]^{w_0} =$
 $[[\text{the}]([\text{who } \lambda_x \text{Bea talked to } x]^{w_0}) = \text{carla + dalia.}$

In (5), the sum of Carla and Dalia feeds the object argument of the main predicate, as in the LF in (9). For the sister of the definite article to be in the domain of the function that the definite article denotes, Bea must have talked to somebody, so the sentence presupposes that Bea talked to somebody and conveys that Ana talked to all the people that Bea talked to—Carla and Dalia, in the case at hand.

- (9) LF: Ana talked to $[\text{FR the who } \lambda_x \text{Bea talked to } x]$

In contrast to the maximal parse, the existential parse of free relatives is restricted. It is naturally found in existential constructions, including HAVE constructions, like (10) (Plann 1980, see also references in Caponigro 2023).²

- (10) Ana tiene $[\text{FR con quien hablar }]$
 Ana has-3S with whom talk-INF
 ‘There are people Ana can talk to.’

In the LF in (11), corresponding to the existential parse of the free relative in (10), a covert existential determiner takes the place of the covert definite determiner in the maximal parse. Under this analysis, the free relative in (11) denotes the existential quantifier in (12). Accordingly, the sentence in (10) conveys that there are people that Ana can talk to.

²While (10) features an infinitival clause, the existential parse of free relatives is not restricted to infinitival clauses only. We can have it in (i), for instance, with a subjunctive clause. The infinitive in (10) naturally conveys modality. The subjunctive in (10) can also convey modality, raising the question of whether the presence of modality is necessary to license the existential parse, a question that I will not address here. For the purposes of illustration, I simply assume a covert modal at LF.

- (i) Ana tiene $[\text{FR quien le hable }]$
 Ana has-3S whom to-her talk-3S-SUBJ
 ‘There are people that talk to Ana.’

(11) LF: $[\text{FR } \exists \text{ who } \lambda_x \text{ PRO}_{\text{Ana}} \text{ can talk to } x]$

(12) $\llbracket (11) \rrbracket^w = \lambda P. \exists x [\text{people}_w(x) \wedge \text{Ana can}_w \text{ talk to } x \wedge P(x)]$

With the maximal and existential parses available, we can take free relatives to behave either like definite or like existential DPs. In the next section, we will see that this assumption faces an undergeneration challenge.

3. The puzzle

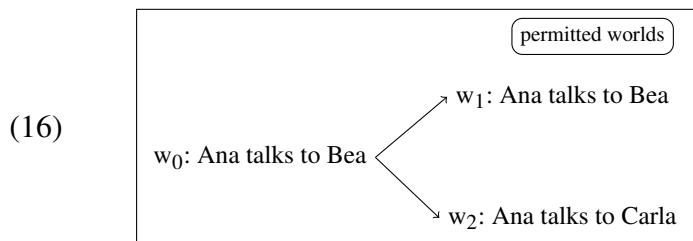
The sentence in (13) is felicitous and true in Scenario 2.

(13) Ana habló $[\text{FR con quien tenía que hablar.}]$
 Ana talked-to-3S with whom had-3S COMP talk-INF
 ‘Ana talked to whom she had to talk.’

(14) *Scenario 2.* To get a new printer for her office, Ana had to talk to one of her supervisors, Bea and Carla. Either one would suffice. In the end, Ana talked to Bea and got her new printer.

The sentence in (13) contains a free relative in object position. In line with the discussion in the previous section, this free relative can be given either a maximal parse, as in (15a), or an existential parse, as in (15b). Neither parse predicts the sentence in (13) to be felicitous and true in Scenario 2, though. We will illustrate the challenge next by discussing the interpretation predicted by each parse, starting with the maximal. In doing so, it will be useful to visualize the type of worlds permitted in Scenario 2 as in (16): Scenario 2 allows for *two* types of permitted worlds, worlds of the type of w_1 , where Ana talks to Bea, and worlds of the type of w_2 , where Ana talks to Carla. In Scenario 2, Ana is then *not* required to talk to anyone in particular.

- (15) a. $[\text{FR the who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x]$
 b. $[\text{FR } \exists \text{ who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x]$



Under the maximal parse of the free relative in the sentence in (13), the covert definite article ranges over the set of people that Ana is required to talk to, as shown in (17), where I assume that w_0 corresponds to the type of world represented by Scenario 2.

$$(17) \quad \llbracket [\text{FR the who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x] \rrbracket^{w_0} = \llbracket \text{the} \rrbracket (\llbracket \text{who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x \rrbracket^{w_0})$$

We just pointed out that, in Scenario 2, Ana is not *required* to talk to anybody, so the argument of the covert definite article in (17) is the empty set, as we see in (18):

$$(18) \quad \llbracket \text{who } \lambda_x \text{ pro}_A \text{ had to talk to } x \rrbracket^{w_0} = \left\{ x : \text{people}_{w_0}(x) \wedge \forall w' \left[\begin{array}{c} \text{permitted}_{w_0}(w') \\ \rightarrow \\ \text{talk}_{w'}(a, x) \end{array} \right] \right\} = \emptyset$$

And this is where the problem lies: the semantics for the definite article that we have adopted, repeated in (19), is defined only for ordered sets that have a maximal element. Assuming that the empty set does not count as one such set (see footnote 1), the denotation of the definite article is not defined for its sister constituent in Scenario 2. Under its maximal parse, the free relative, as a result, fails to denote, and so does the whole sentence, with the LF in (20). Under the maximal parse of its free relative, the sentence in (13) is predicted to be a presupposition failure, even when the sentence is perceived to be felicitous and true in the world described by Scenario 2.

$$(19) \quad \llbracket \text{the} \rrbracket = \lambda X : \max_{\subseteq}(X) \neq \emptyset. \text{ the } x \in \max_{\subseteq}(X)$$

$$(20) \quad \text{LF: Ana talked-to } [\text{FR the who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x]$$

The existential parse for the free relative of the sentence in (13), in (21), does not fare much better than the maximal parse. Under the parse in (21), the covert existential determiner ranges over the empty set, as captured in (22). Because of this, the denotation of the free relative is a generalized quantifier that maps any property P to falsity—as it requires for P to be mapped to truth that there be some entity in the empty set that has P, a condition that never obtains.

$$(21) \quad [\text{FR } \exists \text{ who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x]$$

$$(22) \quad \llbracket [\text{FR } \exists \text{ who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x] \rrbracket^{w_0} = \llbracket \exists \rrbracket (\llbracket \text{who } \lambda_x \text{ pro}_{\text{Ana}} \text{ had to talk to } x \rrbracket^{w_0}) = \llbracket \exists \rrbracket (\emptyset) = \lambda P. \exists x [x \in \emptyset \wedge P(x)]$$

In the LF of our target sentence in (23), this generalized quantifier maps the property of being talked to by Ana to falsity. The sentence is then predicted to be false in Scenario 2, even when, as discussed above, it is judged to be felicitous and true.

$$(23) \quad \text{LF: } [\text{FR } \exists \text{ who } \lambda_x [\text{pro}_{\text{Ana}} \text{ had to talk to } x]] \lambda_y \text{ Ana talked-to } y$$

We face an undergeneration challenge: in Scenario 2, the sentence in (13) is felicitous and true, but, under the assumption that the *wh*-phrase ranges over individuals, it is pre-

dicted to be either non-felicitous (when its free relative is given a maximal parse) or false (when its free relative is given an existential parse.)

In the next section we will see that the sentence in (13) is predicted to be felicitous and true in Scenario 2 if we assume that *wh*- phrases can range over generalized quantifiers in free relatives, like they can do in questions.

4. Higher-order quantification

In parallel to questions, we can assume that the free relative in our target sentence, repeated in (24) below, ranges over generalized quantifiers. In the LF in (25), I assume that *who* ranges over a set of generalized quantifiers containing the actual Montagovian individuals, together with their coordinations and disjunctions, as in (26a). The sister of *who* is also a set of generalized quantifiers: those generalized quantifiers that make the sister of the lambda abstractor in (25) true when interpreted as the value of the generalized quantifier variable. As illustrated in (26b), where w_0 corresponds to the type of world described in Scenario 2, only the disjunction of the Montagovian individuals corresponding to Bea and Carla is in the set denoted by the sister of *who* in Scenario 2. As before, we will assume that the denotation of *who* and its sister constituent combine intersectively. In Scenario 2, only the disjunction of the Montagovian individuals corresponding to Bea and Carla is in the denotation of the sister of *the*. *The* then ranges over the singleton set in (26b).

(24) Ana habló [FR con quien tenía que hablar.]
 Ana talked-to-3S with whom had-3S COMP talk-INF

(25) LF: [FR the $who_{(et,t)t}$ λ_Q had $Q_{et,t}$ λ_x pro_{Ana} talk to x]

(26) a. $\llbracket who_{(et,t)t} \rrbracket^{w_0} = \left\{ \begin{array}{l} \lambda P_{et.P(b), \lambda P_{et.P(c), \dots,} \\ \lambda P_{et.P(b) \wedge P(c), \dots,} \\ \lambda P_{et.P(b) \vee P(c), \dots} \end{array} \right\}$

b. $\llbracket \lambda_Q$ had $Q_{et,t}$ λ_x pro_{Ana} talk to x $\rrbracket^{w_0} = \{ \lambda P_{et.P(b) \vee P(c)} \}$

We can assume that the definite article references an order based on generalized entailment, as in (27), and that, in the case at hand, it picks up the only generalized quantifier in the set that it operates over, the disjunction in (26b), yielding that disjunction as the semantic value of the free relative, as in (28). As a result, the sentence in (24), with the LF in (29), where the free relative QRs, is predicted to be true just in case Ana talked to either Bea or Ana. Since that condition is met in Scenario 2, (24) is correctly predicted to be true.

(27) $\llbracket the \rrbracket = \lambda X: \max_{\subseteq}(X) \neq \emptyset. the\ x \in \max_{\subseteq}(X)$

(28) $\llbracket [FR\ the\ who_{(et,t)t}\ \lambda_Q\ had\ Q_{et,t}\ \lambda_x\ pro_{Ana}\ talk\ to\ x] \rrbracket^w = \lambda P_{et.P(b) \vee P(c)}$.

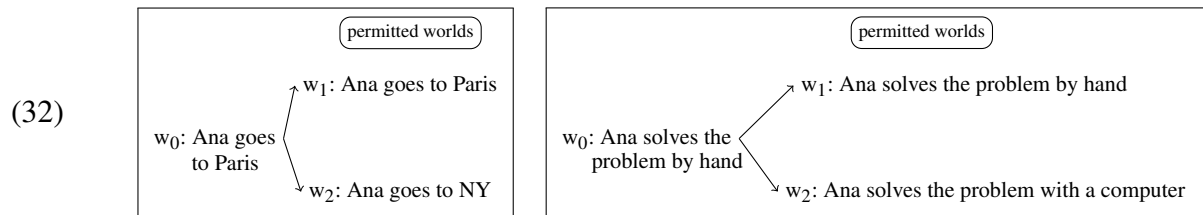
(29) $[the\ who_{(et,t)t}\ \lambda_Q\ [had\ [Q_{et,t}\ \lambda_x\ pro_{Ana}\ talk\ to\ t_x]]] \lambda_y\ Ana\ talked\ to\ y$

Given the previous discussion, we conclude that we can face the undergeneration challenge that we went over in Section 3 if we assume that *wh*-phrases in free relatives range over generalized quantifiers. In the next section we will consider and ultimately reject a number of alternative ways to solve the undergeneration challenge.

Note, to conclude this section, that while *quien*, and its plural counterpart *quienes*, have been argued to range over generalized quantifiers (Elliott et al. 2022, Alonso-Ovalle and Rouillard 2019, 2023), the same undergeneration challenge arises with free relatives headed by other *wh*-phrases: the sentence in (30), containing a free relative headed by *donde* (‘where’), and the sentence in (31), which contains a free relative headed by *como* (‘how’), are taken to be true in the scenarios depicted in Figure 2, where there is no place where Ana was *required* to go or no manner in which she was *required* to solve the problem.

- (30) Ana fue a donde tenía que ir.
 Ana went-3S to where had-3S COMP go-INF
 ‘Ana went where she had to go.’

- (31) Ana resolvió el problema como lo tenía que resolver.
 Ana solved-3S the problem how it had-3S COMP solve-INF
 ‘Ana solved the problem the way she had to solve it.’



5. Alternatives

We will now consider two alternative ways of capturing the missing interpretation discussed in Section 3: (i) that the free relative under discussion receives an amount interpretation, and (ii) that it receives a kind interpretation. We will see that each of these possibilities faces both undergeneration and overgeneration challenges of their own.

5.1 Amount interpretations?

Mendia (2017) shows that Spanish headed relatives allow for amount interpretations: for instance, the sentence in (33) is felicitous and true in the scenario described in (34).

- (33) Ana habló con las personas con las que tenía
 Ana talked-3S with the-FEM-PL person-PL with the-FEM-PL COMP had-3S
 que hablar.
 COMP talk-INF
 ‘Ana talked to the number of people that she had to talk to.’

Higher-order quantification outside questions

- (34) *Scenario 3.* Ana had to talk to seven people. She could choose who to talk to. In the end she talked to seven people.

‘Light headed’ relatives of the type exemplified in (35), where the head noun is missing, also allow for amount interpretations: when it is clear that the intended head noun refers to people, the sentence in (35) is also felicitous and true in Scenario 3.

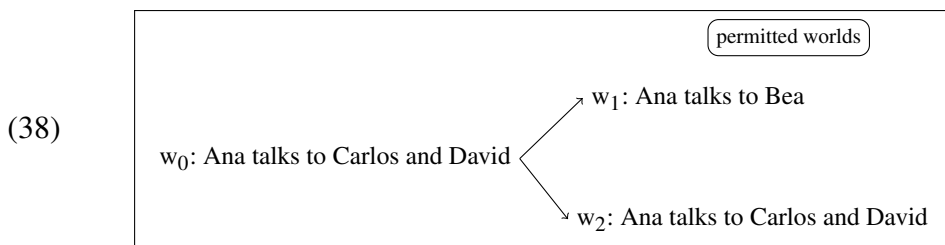
- (35) Ana habló con las que tenía que hablar.
 Ana talked-3S with the-FEM-PL COMP had-3S COMP talk-INF
 ‘Ana talked to the number of people she had to talk to.’

With these two observations in mind, it is only natural to consider the possibility that the target sentence discussed in Section 3, repeated in (36) below, may also have an amount interpretation. Under that interpretation, the sentence would convey that Ana talked to the number of people that she had to talk to. In Scenario 2 Ana had to talk to one person, so, under its potential amount interpretation, the sentence would be predicted to be felicitous and true, in line with intuitions.

- (36) Ana habló con quien tenía que hablar.
 Ana talked-3S with who had-3S COMP talk-INF
 ‘Ana talked to the number of people she had to talk to.’

Postulating an amount interpretation would nevertheless not get us out of the undergeneration challenge. To see that, we note that (36) is also felicitous and true in the scenario described below and represented in (38).

- (37) *Scenario 4.* To get a new printer for her office, Ana had to talk to her supervisor, Bea, or to the team of accountants, Carlos and David, together. Either option would suffice. In the end, she talked to Carlos and David and got her new printer.



Under an amount interpretation, the sentence in (36) is predicted to convey that Ana talked to a set of people with cardinality n , where n can be taken to be the largest member of the set of cardinalities in (39), which contains the cardinalities n such that in all permitted worlds Ana talks to exactly n people.

- (39) $\{n : \forall w' [\text{permitted}_{w_0}(w') \rightarrow |\{x : \text{talk}_{w'}(a, x)\}| = n]\}$

In Scenario 4, the set in (39) is empty, so, under this interpretation, the sentence would be predicted to be a presupposition failure, rather than being felicitous and true, as intuited.

One could assume that the cardinality that the potential amount interpretation references is a different one, namely the largest cardinality in the set in (40), which contains the cardinalities n such that in all permitted worlds Ana talks to n or more people. But that would not help, either. In the scenario at stake, that cardinality would be one, but Ana didn't talk to one person in Scenario 4, so the sentence would be predicted to be false in Scenario 4, contrary to intuitions.

$$(40) \quad \{n : \forall w' [\text{permitted}_{w_0}(w') \rightarrow |\{x : \text{talk}_{w'}(a, x)\}| \geq n]\}$$

Resorting to a potential amount interpretation would not help us get out of the under-generation challenge then. Moreover, assuming that *quien* free relatives have unrestricted amount interpretations would run into an overgeneration problem. Headed relative clauses and light headed relative clauses have amount interpretations: both (41b) and (41c) can answer the *how many* question in (41a). In contrast, the counterparts of (41b) and (41c) with a singular (41d) or plural (41e) *who* free relative cannot. This would be unexpected if the *who* free relatives had an amount interpretation.

- (41)
- a. How many people did he get in his car?
 - b. Metió en su coche (a) las personas que cabían.
put-3S in his car (OBJ) the-FEM-PL people that fit-3PL
'He got in his car as many people as they fit.'
 - c. Metió en su coche (a) los que cabían.
put-3S in his car (OBJ) the-MASC-PL that fit-3PL
'He got in his car as many people as they fit.'
 - d. ?Metió en su coche a quien cabía.
put-3S in his car OBJ who-SG fit-3PL
'He got in his car that person or those people who fit.'
 - e. ?Metió en su coche a quienes cabían.
put-3S in his car OBJ who-PL fit-3PL
'He got in his car those people who fit.'

Finally, free relatives contrast with amount relatives in other respects. The sentence in (42) shows that the heads of amount relatives can be related to the 'logical subject' of the existential construction, as noted in Carlson 1977. In line with their attested amount interpretations, 'light headed' relatives are not different, as seen in (43). Free relatives contrast sharply with both amount relatives and light headed relatives with an amount interpretation, as the deviance of the sentence(s) in (44) illustrate.

- (42) There wasn't [the water in the sink that there was — in the bathtub].
(Carlson 1977, attributed to Lisa Selkirk)

Higher-order quantification outside questions

- (43) No había en el salón los que había — en la oficina.
 not was-3S in the living room the-MASC-PL COMP were-3PL — in the office
 ‘There weren’t in the living room (the things / people) that were in the office.’
- (44) No había en el salón *quien(es) había — en la oficina.
 not was-3S in the living room who(-PL) were-3PL — in the office

In view of the evidence discussed above, we abandon the idea of solving the undergeneration challenge by assuming that *quien(es)* free relatives have amount interpretations.

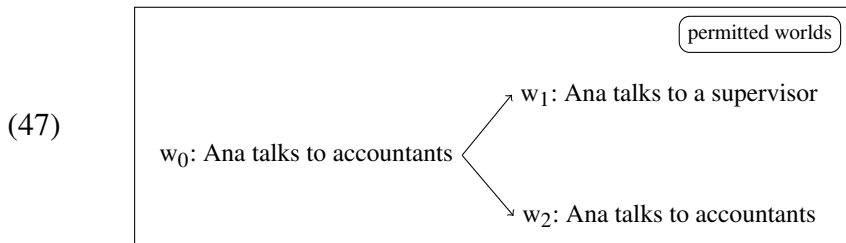
5.2 (Sub)kind interpretations?

We will now consider and also discard a second possible way out of the undergeneration challenge. Mendia (2017) defends that amount relatives denote (sub)kinds. We can entertain the possibility that our target sentence, repeated once more in (45), has a kind interpretation, along the lines of the translation below.

- (45) Ana habló con quien tenía que hablar.
 Ana talked-3S with who had-3S COMP talk-INF
 ‘Ana talked to the kind of people that she had to talk to.’

Against this possibility, we note that, as discussed, the sentence in (45) is felicitous and true in Scenario 3, a scenario that can be schematized as in (47). Under a kind interpretation, the sentence would be predicted to convey that Ana talked to some instances of the kind denoted by the free relative. The free relative would range over the set in (46), the set containing any kind *k* such that in all permitted worlds Ana talks to some instances of *k*. The problem should be familiar by now: as seen in (47), the set in (46) is empty in Scenario 3, and, so (45) is predicted to be a presupposition failure, contrary to intuitions.

- (46) $\{k : \forall w' [\text{permitted}_{w_0}(w') \rightarrow \exists x [\text{talk}_{w'}(a, x) \wedge \text{instantiate}(x, k)]]\}$



Resorting to a kind interpretation for the free relative doesn’t help with the undergeneration challenge, then. Moreover, postulating such interpretation would run into an overgeneration challenge: Caponigro (2023) shows that Italian *chi* (‘who’) free relatives don’t generally allow for kind interpretations, and the same goes for Spanish, as (48) and (49) illustrate.

(48) ??Quien habla diez lenguas es raro.
who speak-3S ten languages is-3S rare

(Intended, not possible):

‘The kind of person who speaks ten languages is a rare kind.’

(49) ??Quien tiene el pelo moreno es común en el sur de España.
who has-3S the hair dark is-3S common in the south of Spain

(Intended, not possible):

‘The kind of people who has dark hair is a common kind in Southern Spain.’

Trying to solve the undergeneration challenge in Section 3 by assuming that *quien* free relatives have kind interpretations faces both undergeneration and overgeneration threats.

6. Conclusions and questions ahead

We have seen that, in parallel to Spector’s question data (Spector 2007, 2008), free relatives with universal modals provide reasons to believe that *wh*-phrases range over generalized quantifiers, in particular disjunctions. Assuming that *wh*-phrases range over lower level entities cannot derive the interpretation of free relatives containing necessity modals, whether we treat those as definite or existential expressions: under the first type of analysis, free relatives are predicted to be presupposition failures in scenarios where they are intuited to be felicitous and true; under the second type of analysis, free relatives are predicted to be false in the same type of scenarios. In contrast, we derive the right interpretation of free relatives containing universality modals if we let their *wh*-phrases range over disjunctions.

If the conclusion that *wh*-phrases can range over generalized quantifiers is on the right track, there are many questions ahead. An obvious question that deserves scrutiny is whether *wh*-phrases in free relatives can range over regular entities, as well as over generalized quantifiers. A second obvious question is what kind of generalized quantifiers *wh*-phrases range over in free relatives. In this paper, we have assumed that the space of possibilities include Montagovian individuals, as well as their conjunctions and disjunctions. Finally, one would like to understand why existential readings are so restricted.

All these questions find parallels in the literature on questions. And, of course, there are general parallels between free relatives and questions. To mention just one, Spector 2008 noted that high order readings of free relatives are themselves quite restricted: for instance, disjunctions cannot scope within weak islands like negation or factive predicates, as illustrated by (50) and (51) below.

(50) Which books didn’t Jack read?

Unavailable: ‘Jack read neither the French novels nor the Russian novels.’

(Spector 2008)

Higher-order quantification outside questions

- (51) Which books does Sue know that Jack read?
Unavailable in case Sue knows that Jack read one of the two but doesn't know which: 'Sue knows that Jack either read the French novels or the Russian novels.'
(Spector 2008)

The same is true for free relatives. In a situation where Ana was not required to talk to Carla or Dalia, the sentence in (52) cannot convey that Ana didn't talk to Carla or Dalia, as we would expect if the free relative could denote a disjunction scoping under the modal. Likewise, the sentence in (53) cannot describe a situation where Bea knows that she talked to either Carla or Dalia and Ana talked to one of them.

- (52) Ana habló [FR con quien no tenía que hablar.]
Ana talked-3S with who NEG had-3S COMP talk-INF
Unavailable where Ana was not required to talk to Carla or Dalia:
'Ana didn't talk to Carla or Dalia.'
- (53) Ana habló [FR con quien Bea sabe que habló]
Ana talked-3S with who Bea know-3S COMP talked-3S
Unavailable where Bea knows that she talked to either Carla or Dalia:
'Ana talked to Carla or Dalia.'

Finally, Chierchia and Caponigro (2013) note that the existential readings of free relatives are partly related to 'mention-some' interpretations of questions, which are themselves restricted.

With these parallels in front of us, it is reasonable to expect that exploring the connection between free relatives and questions, possibly along the lines of Chierchia and Caponigro (2013), may provide answers to some of the questions ahead.

References

- Alonso-Ovalle, Luis, and Vincent Rouillard. 2019. Number inflection, Spanish bare interrogatives and high-order quantification. In *Proceedings of the Forty-Ninth Annual Meeting of the North East Linguistic Society*, ed. by Maggie Baird and Jonathan Pesetsky, 25–39. Amherst, MA: Graduate Linguistics Student Association.
- Alonso-Ovalle, Luis, and Vincent Rouillard. 2023. Spanish bare interrogatives and number. *Journal of Semantics* 2-3:289–309.
- Caponigro, Ivano. 2003. Free not to ask: On the semantics of free relatives and wh-words cross-linguistically. Doctoral dissertation, UCLA.
- Caponigro, Ivano. 2023. Referring and quantifying without nominals: Headless relative clauses across languages. In *Proceedings of the 33rd Semantics and Linguistic Theory Conference*, ed. by Juhyae Kim, Burak Öney, Yao Zhang, and Fengyue (Lisa) Zhao, 744–774.

Luis Alonso-Ovalle

- Carlson, Gregory. 1977. Amount relatives. *Language* 53:520–542.
- Chierchia, Gennaro, and Ivano Caponigro. 2013. Questions on questions and free relatives. URL <https://scholar.harvard.edu/chierchia/publications/demo-presentation-handout>, presented at *Sinn und Bedeutung 18*.
- Elliott, Patrick, and Uli Sauerland. 2019. Ineffability and unexhaustification. In *Proceedings of Sinn und Bedeutung 23*, ed. by María Teresa Espinal, Elena Castroviejo, Manuel Leonetti, Louise McNally, and Cristina Real-Puigdollers, volume 1, 399–411. Ithaca, NY: Universitat Autònoma de Barcelona, Bellaterra. URL <https://semanticsarchive.net/Archive/Tg3ZGI2M/Proceedings23.html>.
- Elliott, Patrick D., Andrea C. Nicolae, and Uli Sauerland. 2022. Who and what do *who* and *what* range over cross-linguistically. *Journal of Semantics* 39:1–29.
- Jacobson, Pauline. 1995. On the quantificational force of English Free Relatives. In *Quantification in natural languages*, ed. by Angelika Kratzer Emmon Bach, Eloise Jelinek and Barbara H. Partee, 451–486. Dordrecht: Kluwer.
- Mendia, Jon Ander. 2017. Amount relatives redux. Doctoral dissertation, University of Massachusetts Amherst.
- Plann, Susan. 1980. *Relative clauses in Spanish without overt antecedents and related constructions*. University of California Press.
- Spector, Benjamin. 2007. Modalized questions and exhaustivity. In *Proceedings of 18th Semantics and Linguistic Theory Conference (SALT XVIII)*, ed. by T. Friedman and M. Gibson, 282–299. Ithaca, NY: CLC Publications, Cornell University.
- Spector, Benjamin. 2008. An unnoticed reading for wh-questions: Quantified elided answers and weak islands. *Linguistic Inquiry* 32:677–686.
- Šimik, Radek. 2021. Free relatives. In *The Wiley Blackwell Companion to Semantics*, ed. by Daniel Gutzmann, Lisa Matthewson, Cécile Meier, Hotze Rullmann, and Thomas Ede Zimmermann. Wiley Blackwell.
- Xiang, Yimei. 2021. Higher-order readings of *wh*-questions. *Natural Language Semantics* 29:1–45.

Luis Alonso-Ovalle
luis.alonso-ovalle@mcgill.ca