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On the semantics of indefinite free relatives

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Unlike Germanic, Italian and many other languages from different language families allow *wh*- clauses to occur as the complement of existential predicates and be interpreted as indefinites. I call these *wh*- clauses *indefinite free relatives*. A compositional semantics will be given for indefinite free relatives that is based on Jacobson's (1995) proposal for the semantics of *wh*- words. In a nutshell, I will argue that indefinite free relatives denote a singleton set which contains only a maximal plural individual. The matrix predicate takes this set as its complement and asserts its non-emptiness.

1. Introduction

The examples in (1) from Italian show that what looks like the same embedded *wh*- clause is interpreted in three different ways: as a (singular or plural) indefinite in (1a), as a (singular or plural) definite in (1b) and as a question/answer denoting expression in (1c).

- (1) a. C'è [chi dice sempre di sì].
there's who says always of yes
'There is somebody/people who always says/say yes.'
- b. Non sopporto [chi dice sempre di sì].
not stand.1SG who says always of yes
'I can't stand the person/people who always says/say yes.'
- c. So [chi dice sempre di sì].
know.1SG who says always of yes
'I know who always says yes.'

These facts are partially unsurprising. The bracketed *wh*-clause in (1c) is clearly an embedded *wh*-interrogative clause: it occurs as the complement of a predicate that selects for a question/answer denoting expression and is interpreted as such. The bracketed *wh*-clause in (1b), instead, is an example of what has been traditionally called a free or headless relative clause (henceforth, FR), that is an embedded *wh*-clause which resembles a DP containing a headed relative clause because of its internal gap and its DP-like distribution and interpretation. Jacobson (1995) convincingly argues that FRs are semantically equivalent to definite descriptions. Henceforth, I will call these *wh*-clauses *definite FRs*. I will do so to distinguish definite FRs from the *wh*-clauses of the kind in (1a), which also have an internal gap and can be replaced and paraphrased with headed relative clauses. Nevertheless, they have a much more restricted distribution, as we will soon see, and are interpreted as indefinites. This is why I label them *indefinite FRs*.

Unlike the other two *wh*-constructions, indefinite FRs have been largely ignored in both the syntactic and semantic literature.¹ This paper is about their semantic properties and how they can be compositionally derived.

The structure of the paper is as follows. I will start with a precise definition of indefinite FRs (§2). Then, I will make use of this definition to show that indefinite FRs are a productive construction in Italian and in many other languages from different language families (§2 and §3). Once the non-idiosyncratic nature of indefinite FRs has been established, I will briefly compare indefinite FRs with definite FRs and *wh*-interrogatives. It will turn out that these three constructions are syntactically and semantically different, but crucially they make use of the same *wh*-words (§4). Finally, I will give a compositional semantics for indefinite FRs that capitalizes on Jacobson's (1995) semantics for *wh*-words in definite FRs and *wh*-interrogatives (§5).

2. Indefinite FRs: a definition

I assume indefinite FRs to be all and only the strings that satisfy the following three conditions:

¹ Indefinite FRs in French and Spanish are briefly mentioned in Hirschbühler (1978: 168-170), where they are called infinitival FRs. Grosu (1994: 137-142) discusses the syntactic properties of indefinite FRs, which he calls irrealis FRs, in Spanish, Romanian and Modern Hebrew. Grosu & Landman (1998: 155-158) mention indefinite FRs as an example of a *wh*-construction that does not show maximality, since, according to them, indefinite FRs are just open formulas. Finally, Pancheva Izvorski (2000: Ch.2) discusses indefinite FRs in Slavic and Romance to conclude that they do not show maximality and therefore they must be *wh*-interrogatives.

(2) Indefinite FRs:

- i. are wh- clauses;
- ii. occur as the complements of existential verbs (mainly the equivalents of existential *be* and existential *have*);
- iii. can be replaced and paraphrased with indefinite DPs.

It is easy to see how the bracketed string in (1a), repeated as (3a) below, satisfies the definition in (2). First, it has the wh- word *chi* ‘who’ in clause initial position, that is it looks like a typical wh- clause in Italian. Second, it is the complement of existential *essere* ‘be’. Finally, it can be replaced and paraphrased with a (complex) indefinite DP, as shown in (3b).

- (3) a. C’è [indefinite FR *chi dice sempre di sì*].
 there’s who says always of yes
 ‘There is somebody/people who always says/say yes.’
 b. Ci sono [indefinite DP (*delle*) *persone che dicono sempre di sì*].
 there are (some) people that say always of yes
 ‘There are people who always say yes’

Another example of an indefinite FR in Italian is given in (4a). The bracketed string is a wh- clause headed by the wh- word *dove* ‘where’, it occurs as the complement of existential *avere* ‘have’, and it can be replaced and paraphrased with an indefinite DP, as shown in (4b).

- (4) a. Non aveva [indefinite FR *dove nascondersi*] in caso di pericolo.
 not had.3SG where to-hide-himself in case of danger
 ‘He didn’t have a place/places where he could hide in case of danger.’
 b. Non aveva [indefinite DP *un posto in cui nascondersi*] in caso di pericolo.
 not had.3SG a place in which to-hide-himself in case of danger
 ‘He didn’t have a place where he could hide in case of danger.’

The examples in (3a) and (4a) also show that indefinite FRs in Italian are a productive construction that can take different wh- words (*chi* ‘who’ and *dove* ‘where’, respectively) and be introduced by more than one existential predicate (*essere* ‘be’ and *avere* ‘have’, respectively).

3. Crosslinguistic distribution

Indefinite FRs are found in other Romance languages, in Slavic, Finno-Ugric, Modern Greek and Modern Hebrew. Examples are give below.

- (5) *Spanish* (Heriberto Avelino, p.c.)
 Tengo [con quién hablar] quando estoy triste.
 have.1SG with whom to-speak when am sad
 'I have somebody to talk to when I am sad.'

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

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

- (8) *Romanian* (Grosu 1994: 138)
 Maria are [cu cine vota].
 M. has with whom to-vote
 'Maria has somebody to vote for.'

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

- (10) *Serbo-Croatian* (Alexandra Perovic p.c.)
 Nemam [ga kome dati].
 not-have.1SG it.ACC whom.DAT give.1 SG
 'I have noone to give it to.'

- (11) *Bulgarian* (Rudin 1986: 190)
 Toj ima [s kogo da govori].
 he has with whom PARTICLE talk.3 SG
 'He has somebody to talk to.'

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

Van [kivel beszélni].
is who. INS to-talk
'There is/are someone/people to talk to.'

- (13) *Modern Greek* (Maria Baltazani p.c.)

Exo [me pion na miliso] otan ime lipimenos.
have.1 SG with whom. ACC PARTICLE talk.1 SG when am sad
'I have somebody to talk to when I am sad.'

- (14) *Modern Hebrew* (Grosu 1994: 138; Daphna Heller p.c.)

eyn li [im mi le-daber].
not-is to-me with who to-talk
'I don't have anybody to talk to.'

For reasons that are not known to me, indefinite FRs are not found in any Germanic language, except Yiddish:

- (15) *Yiddish* (Adam Albright p.c.)

Ikh hob nit [mit vemen ikh ken reden], az ikh bin troyerik.
I have not with who. DAT I can speak, when I am sad
'I don't have anybody to talk to when I am sad.'

- (16) *Yiddish* (Koysef n.d.)²

[...] nisht vayl es iz nisht geven [mit vemen tsu redn].
 not because it has not been with whom to speak
'[...] not because there wasn't anyone to talk to.'

- (17) *English* (Carson Schütze p.c., Harold Torrence p.c.)

*I have [who(m) to talk to] when I am sad.

- (18) *German* (Daniel Buring p.c.)

*Ich habe [mit wem ich sprechen kann], wenn ich traurig bin.
I have with whom I speak can, when I sad am

² Thanks to Adam Albright for pointing this out to me.

(19) *Dutch* (Hilda Koopman p.c.)

*Ik heb [met wie te praten] als ik me triest voel.

I have with who to talk if I me sad feel

In conclusion, the examples above show that indefinite FRs are not an idiosyncrasy of Italian, but they are a productive construction which is attested in many languages from different language families.

4. Indefinite FRs, definite FRs and *wh*-interrogatives

Can indefinite FRs be considered just a sub-case of either definite FRs or *wh*-interrogatives? They are introduced by the same *wh*-words and, as we saw in (1), they can look identical in form. Nevertheless, there is syntactic and semantic evidence that shows that indefinite FRs are crucially different. In this section, I will briefly go over some of the most important differences between these constructions.

4.1. Indefinite FRs are not definite FRs

Let us go back to the examples of Italian indefinite and definite FRs in (1a) and (1b). They are repeated below in (20a) and (21a), respectively.

- (20) a. C'è [_{indefinite FR} chi dice sempre di sì].
 there's who says always of yes
 'There is somebody/people who always says/say yes.'
 b. Ci sono [_{indefinite DP} (delle) persone che dicono sempre di sì].
 there are (some) people that say always of yes
 'There are people who always say yes.'
- (21) a. Non sopporto [_{definite FR} chi dice sempre di sì].
 not stand.1 SG who says always of yes
 'I can't stand the person/people who always says/say yes.'
 b. Non sopporto [_{definite DP} le persone che dicono sempre di sì].
 not stand.1 SG the people that say always of yes
 'I can't stand the people that always say yes.'

Among the similarities, indefinite and definite FRs are introduced by the same *wh*-words and they may look identical, as one can see in the examples above. Also, they both have a DP-like distribution and receive a DP-like interpretation, as made clear by the English translation. The sentences in (20b) and (21b) show that both indefinite and definite FRs can be replaced and paraphrased with a DP.

Nevertheless, important differences distinguish these *wh*- constructions. First of all, indefinite FRs can be paraphrased with indefinite DPs, but not with definite DPs. Definite FRs, instead, exhibit the opposite behavior: definite DPs can replace them without changing the truth conditions of the sentence, while indefinite DPs cannot. Second, there are languages that have definite FRs, but not indefinite FRs (e.g. Germanic). This would be even more unexpected if we were dealing with exactly the same construction. Third, definite FRs have syntactic restrictions that indefinite FRs do not (they exhibit categorial and case matching effects and they do not allow infinitives or subjunctive; cf. Appendix). Finally, indefinite FRs occur only as complements of a very small class of predicates, while definite FRs can occur more freely as arguments or adjuncts.

In conclusion, indefinite FRs are not definite FRs. Nevertheless, they have the same *wh*- words.

4.2. Indefinite FRs are not *wh*- interrogatives

Let us now compare indefinite FRs and *wh*- interrogatives. Indefinite FRs are introduced by a subset of the *wh*- words that introduce *wh*- interrogatives. They have similar syntactic properties (they can both be infinitival and neither show case or categorial matching effects; cf. Appendix).

Nevertheless, no language seems to have indefinite FRs with the equivalents of *wh*- words like *why* or *what/which*+NP. This would be totally unexpected if indefinite FRs were *wh*- interrogatives. Also, they are selected by different classes of predicates. Indefinite FRs occur with existential predicates which never select for an interrogative, as shown by the ungrammaticality of (22).

- (22) * C'è [yes/no interrogative se Harold dice sempre di sì].
 there's if Harold says always of yes

Last but not least, they are interpreted in a completely different way. Indefinite FRs are paraphrased with indefinite DPs, as we just saw in 4.1. *Wh*- interrogatives, instead, cannot usually be replaced by DPs, but they may be paraphrasable with declarative clauses. For instance, the *wh*- interrogative in (23a) is more or less equivalent to the embedded declarative clause in (23b), if they are evaluated in a situation in which Harold is the only person who always says yes.

- (23) a. So [wh- interrogative *chi dice sempre di sì*].
 know.1 SG who says always of yes
 ‘I know who always says yes.’
 b. So [declarative clause *che Harold dice sempre di sì*].
 know.1SG that Harold says always of yes
 ‘I know that Harold always says yes.’

In conclusion, indefinite FRs are not wh- interrogatives (contra Pancheva Izvorski 2000). Nevertheless, indefinite FRs make use of a subset of the wh- words that are found in wh- interrogatives.

5. *The semantics of indefinite FRs*

So far, we have concluded that indefinite FRs are an independent linguistic object. Their syntactic and semantic properties cannot be reduced to either definite FRs or wh- interrogatives. Nevertheless, we saw that all three wh- constructions share the same wh- words.

In this section, I will give a compositional semantics for indefinite FRs which capitalizes on Jacobson’s (1995) proposal concerning the semantics of wh- words in definite FRs and wh- interrogatives. First, I will briefly introduce Jacobson’s (1995) proposal. Then, I will show how it can be applied to indefinite FRs in order to compositionally derive a meaning for indefinite FRs that makes them equivalent to indefinites.

5.1. *The meaning of wh- words (Jacobson 1995)*

According to Jacobson (1995), the wh- words in definite FRs and wh- interrogatives in English are the same lexical items and, therefore, their semantic contribution is the same in both constructions. The basic intuition is that wh- constructions convey maximality and maximality is lexically encoded in the meaning of wh- words. More precisely, wh- words denote a function that applies to a set *P* of individuals and returns the singleton set containing the maximal plural individual of *P*. A theory of plurality like the one in Link (1983) is assumed, where a formally defined sum operation applies to the denotation of certain predicates (most likely at the level of the lexicon) to form plural individuals starting from atomic ones.

Let us go over the example in (24) and see how Jacobson’s proposal works.

- (24) I know/tasted [_{CP} *what*_{*i*} [_{IP} *Harold cooked t_i*]]

The *wh*- clause in (24) [*what_i Harold cooked t_i*] can be either a definite FR or *wh*- interrogative depending on the matrix predicate. This is not crucial because the basic meaning of both *wh*- CPs is identical. They both denote the set containing the maximal plural individual that results from the sum of all the atomic individuals that Harold cooked (if Harold cooked just one thing, the only atomic individual and the maximal plural individual coincide).

For instance, if Harold cooked Tuscan soup, risotto, and salmon, then the *wh*- clause will denote a set containing just the plural individual that is made up of all those three atomic individuals together (risotto+salmon+soup). This is shown graphically in (25). (25a) lists the atomic individuals or things that Harold cooked. (25b) illustrates the denotation of the IP [*IP Harold cooked t_i*]: the set containing all the atomic individuals that Harold cooked plus all the plural individuals resulting from all the possible “sums” of the atomic individuals Harold cooked. When the *wh*- word is combined with the IP, its semantic contribution changes the denotation of the clause from the set in (25b) to a singleton set which contains only the maximal plural individual of the set in (25b), as shown in (25c).

- (25)a. Atomic individuals that Harold cooked:
r: risotto
s: salmon
t: Tuscan soup
- b. $\llbracket [\text{IP } \textit{Harold cooked } t_i] \rrbracket =$
-
- c. $\llbracket [\text{CP } \textit{what}_i \textit{Harold cooked } t_i] \rrbracket =$ $\{ \text{r+s+t} \}$

A more formal version of the semantic derivation of the example in (24) that has just been sketched is given in (26) and (27).

- (26) **X, Y** : variables over atomic and plural individuals
h : individual constant
P : variable over sets of atomic and plural individuals
* : operator that closes a predicate under sum formation (Link 1983)
 \leq : part-of relation ($a \leq c$ iff $c = a+b$)

(27) *wh- CP*

- a. $[_{IP} \text{Harold cooked } t_i] \rightsquigarrow \lambda Y[*\text{cooked}'(Y)(\mathbf{h})]$
- b. $[\text{what}] \rightsquigarrow \lambda \mathbf{P}[\lambda X[\mathbf{P}(X) \wedge \forall Y(\mathbf{P}(Y) \rightarrow Y \leq X)]]$
- c. $[_{CP} \text{what}_i \text{Harold cooked } t_i] \rightsquigarrow$
 $\lambda \mathbf{P}[\lambda X[\mathbf{P}(X) \wedge \forall Y(\mathbf{P}(Y) \rightarrow Y \leq X)]] (\lambda Y[*\text{cooked}'(Y)(\mathbf{h})])$
 $= \lambda X[*\text{cooked}'(X)(\mathbf{h}) \wedge \forall Y(*\text{cooked}'(Y)(\mathbf{h}) \rightarrow Y \leq X)]$

As we already briefly discussed, definite FRs and *wh*-interrogatives do not have the same meaning. Jacobson (1995) accounts for this difference starting from the identical meaning of *wh*-CPs and applying to it two different semantic operations. If the *wh*-CP *what Harold cooked* is the complement of a DP-selecting predicate like *taste* in (28a), then it turns into a FR and a type-shifting operation will apply to its denotation which will lower it to an object of type $\langle e \rangle$ rather than of type $\langle e, t \rangle$. In other words, a FR will end up denoting the maximal plural individual itself and not the set containing it (28b).

(28) *Definite FR*

- a. I tasted $[_{\text{definite FR}} \text{what Harold cooked}]$.
- b. $[_{\text{definite FR}} \text{what Harold cooked}] \rightsquigarrow$
 $tX[*\text{cooked}'(X)(\mathbf{h}) \wedge \forall Y(*\text{cooked}'(Y)(\mathbf{h}) \rightarrow Y \leq X)]$

If the *wh*-CP, instead, is the complement of an interrogative predicate like *know* (29a), it turns into a *wh*-interrogative and a semantic operation will apply to it so that its final denotation will be the unique true proposition that asserts that Harold cooked all the things that he cooked. In a situation like (25a) above, it would be a proposition that asserts that Harold cooked Tuscan soup, risotto and salmon.

(29) *Wh- interrogative*

- a. I know $[_{\text{wh- interrogative}} \text{what Harold cooked}]$.
- b. $[_{\text{wh- interrogative}} \text{what Harold cooked}] \rightsquigarrow$
 $\uparrow \mathbf{p}[\exists X(\neg \mathbf{p} \wedge \mathbf{p} = [*\text{cooked}'(X)(\mathbf{h}) \wedge \forall Y(*\text{cooked}'(Y)(\mathbf{h}) \rightarrow Y \leq X)])]$

5.2. Proposal: the semantics of indefinite FRs

In this section I will give a compositional semantics for indefinite FRs that captures two crucial facts: first, the *wh*-words in indefinite FRs are morphologically identical to the *wh*-words in definite FRs and *wh*-interrogatives; second, indefinite FRs can always be paraphrased with indefinite DPs. In order to do this, I will make further semantic and syntactic assumptions.

Assumption I: the meaning of wh- words. I assume that the morphological identity of wh- words implies that we are dealing with the same lexical items in all three wh- constructions. Therefore, the meaning of wh- words in indefinite FRs is the same as the meaning that Jacobson (1995) assigns to wh- words in definite FRs and wh- interrogatives: they are functions that apply to a set and return the singleton set containing the unique maximal plural individual of the argument set (cf. 5.1 above).

Assumption II: the meaning of existential predicates. Following Milsark (1974) and Grosu & Landman (1998), I assume that the existential predicates that allow indefinite FRs as their complements (*be*, *have*, etc.) take a set denoting complement and lexically introduce existential quantification over that set, or, more precisely, assert the non-emptiness of that set.

Assumption III: the syntax of indefinite FRs. Following Grosu (1994), I assume that indefinite FRs have the same syntactic structure as wh- interrogatives: they are bare CPs. This would also account for the syntactic similarities between indefinite FRs and wh- interrogatives we briefly discussed in 4.2.

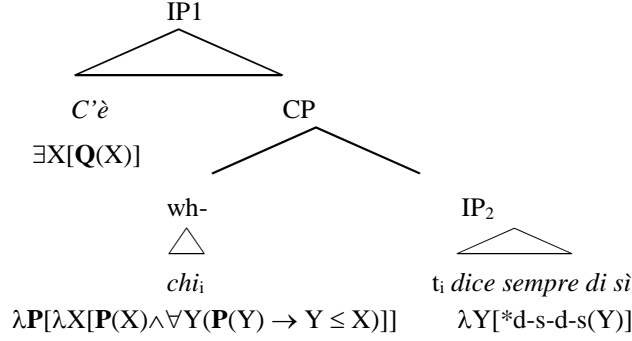
Given the assumptions above, we can now move to the semantic proposal for indefinite FRs. The basic idea is that indefinite FRs are just wh- CPs and denote what wh- CPs denote, namely a singleton set containing a maximal plural individual. The matrix existential predicate takes this set as its argument and existentially closes it. In other words, the existential matrix predicate simply asserts that the set denoted by the indefinite FR is not empty. Given the lexical property of wh- words, if the set is not empty, it can only contain a maximal individual. Thus, the matrix predicate indirectly asserts that there is a maximal plural individual that has the property expressed by the indefinite FRs.

Let us go back to the example of an indefinite FR we started with, which I repeat in (30) below, and see how my proposal accounts for it.

- (30) C'è [_{indefinite FR} chi_i t_i dice sempre di sì].
 there's who says always of yes
 'There is somebody/people who always says/say yes.'

A simplified syntactic structure for (30) is given in (31), together with the translation of the wh- word and the IP of the indefinite FR. A more detailed translation is given in (32).

(31)



- (32)a. $\text{IP}_2 \rightsquigarrow \lambda Y[*\text{d-s-d-s}(Y)]$
(from the lexicon, by function application and λ abstraction)
- b. $\text{wh-} \rightsquigarrow \lambda \mathbf{P}[\lambda X[\mathbf{P}(X) \wedge \forall Y(\mathbf{P}(Y) \rightarrow Y \leq X)]]$
(from the lexicon)
- c. $\text{CP} \rightsquigarrow \lambda \mathbf{P}[\lambda X[\mathbf{P}(X) \wedge \forall Y(\mathbf{P}(Y) \rightarrow Y \leq X)]] (\lambda Y[*\text{d-s-d-s}(Y)])$
 $\equiv \lambda X[*\text{d-s-d-s}(X) \wedge \forall Y(*\text{d-s-d-s}(Y) \rightarrow Y \leq X)]$
(from a. and b. by function application)
- d. $\text{IP}_1 \rightsquigarrow \exists X[*\text{d-s-d-s}(X) \wedge \forall y(*\text{d-s-d-s}(Y) \rightarrow Y \leq X)]$
(from c., d., and the lexicon by function application)

Informally, what (32d) says is that there is a group of people (maybe just one person) who always say yes and everybody who always says yes is in that group.

From the definition of the * operator in Link (1983), it follows that if there exists a maximal plural individual, then there also necessarily exist the atomic individuals it is made of. In other words, the equivalence in (33) holds.

$$(33) \exists X[*\text{d-s-d-s}(X) \wedge \forall Y(*\text{d-s-d-s}(Y) \rightarrow Y \leq X)] \leftrightarrow \exists X[\text{d-s-d-s}(X)]$$

The right member of the equivalence in (33) is identical to what is standardly assumed to be the denotation of a sentence like (3b), repeated in (34) below.

- (34) Ci sono [_{indefinite DP} (delle) persone che dicono sempre di sì].
 there are (some) people that say always of yes
 'There are people who always say yes'

Therefore, indefinite FRs turn out to be equivalent to indefinite DPs. This is a welcome result since it accounts for the intuition about the meaning of indefinite FRs we started with: indefinite FRs can always be paraphrased with indefinite DPs (cf. §2).

6. Conclusions

In this paper I discussed a kind of embedded *wh*- clause, indefinite FRs, which is syntactically and semantically different from definite FRs and *wh*- interrogatives.

I showed that, although indefinite FRs are absent in Germanic, they are found in many other languages from different language families.

The morphological shape and the crosslinguistic distribution of *wh*- words in indefinite FRs, definite FRs and *wh*- interrogatives show that the *wh*- words in these three constructions are the same lexical items.

I argued that Jacobson's (1995) analysis of definite FRs and *wh*- interrogatives, which encodes maximality in the lexical meaning of *wh*- words, can be extended to indefinite FRs as well. All these *wh*- constructions denote a singleton set containing a maximal plural individual at a certain point of their semantic derivation. A crucial difference between definite FRs and indefinite FRs is in that the existence of the maximal plural individual is presupposed in a sentence with a definite FR, while it is asserted in a sentence with an indefinite FR. This conclusion accounts for native speakers' intuitions that indefinite FRs are best paraphrased with indefinite DPs.

Appendix

Some syntactic differences between indefinite FRs and definite FRs

1. Matching

Unlike definite FRs, indefinite FRs don't show matching effects. (35) is ungrammatical, the reason being a categorial mismatch between the selectional requirements of the matrix predicate (*incontrare* 'to meet' selects only for a DP complement) and the category of the *wh*- phrase (i.e. PP) in the FR that occurs as the complement of the matrix predicate.

- (35)a. *Ho incontrato [PP con chi] sei appena andato in vacanza.
 have.1SG met.PART with whom are.2SG just gone in vacation
 'I have run into with the one(s) who you just went on vacation with.'

Indefinite FRs, instead, can have either a DP or a PP wh- phrase without the whole sentence being ungrammatical (36). The same is true for wh- interrogatives (37).

- (36)a. Non ho [PP con chi] andare in vacanza.
 not have.1SG with whom go.INF in vacation
 'I don't have anybody to go on vacation with.'
 b. Non ho [DP chi] mandare alla conferenza.
 not have.1SG who send.INF to-the conference
 'I don't have anybody to send to the conference.'
- (37)a. Non so [PP con chi] andare in vacanza.
 not know.1SG with whom go.INF in vacation
 'I don't know who to go on vacation with.'
 b. Non so [DP chi] mandare alla conferenza.
 not know.1SG who send.INF to-the conference
 'I don't know who to send to the conference.'

2. Tense

Indefinite FRs can be tenseless, unlike definite FRs and like wh- interrogatives:

- (38)a. Non avevano [indefinite FR dove rifugiarsi in caso di pericolo].
 not had.3PL where shelter.INF in case of danger
 'They didn't have any place they could shelter in case of danger.'
 b. *Non sono andati [definite FR dove rifugiarsi in caso di pericolo].
 not are.3PL gone where shelter.INF in case of danger
 ('They didn't go where they could shelter in case of danger.')
- c. Non sapevano [wh- interrogative dove rifugiarsi in caso di pericolo].
 not knew.3PL where shelter.INF in case of danger
 'They didn't know where they could shelter in case of danger.'

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