Data of interest

A garden variety free relative (FR) involves a wh-phrase construed simultaneously as an argument of both the matrix and of the embedded predicate. In this abstract I bring to light a new type of construction, a type of multiple free relative (MFR), involving two wh-phrases, each related to an argument of both the matrix and the embedded predicate. In the Romanian example in (1) the people eating are the same ones who brought the stuff that they are eating. These constructions are also quite common in Bulgarian (Rudin, 2008, Dimova, 2014), but to date no semantic account has been offered that can account for their interpretation.

(1) A mânca ce a adus.
has eaten who what has brought.
‘Everyone ate what they brought.’

The goal of this abstract is to provide a compositional semantic account of these MFRs, the first of its kind. Note that these MFRs are not the same as those discussed by Caponigro and Fălăuş (2020), since in those constructions only the top wh-phrase satisfies an argument of the matrix predicate (typically the object).

(3) Bunica a împachetat ce dă de Crăciun.
the.grandma has wrapped what gives for Christmas
Roughly: ‘Grandma wrapped the things she’ll give to the appropriate people.’

The parallels with (functional) multiple wh-questions

In multiple wh-questions replacing the higher wh-phrase with a universal quantifier will deliver the same interpretation as the multiple wh-question on a pair-list reading, (4a-b). The same is true in this case as shown by the fact that replacing the wh-phrase with a universal quantifier delivers the same interpretation ((1) vs (5)).

(4) a. Who ate what?
   (5) A mânca fiecare ce a adus.
   has eaten everyone what has brought
   ‘Everyone ate what they brought.’

We can think of these MFRs as a possible way of answering a multiple wh-question like (4a), (pointed out by Dimova 2014); instead of listing the pairs of who and what they ate, we can respond with the function that is associated with those pairs, as in (4c). So these MFRs can be thought of as answers to multiple wh-questions just like FRs can answer single wh-questions.

(6) Q: What did Mary eat?  A: Mary ate what she brought.

Note that there cannot be an overt subject or object in such constructions, reinforcing the observation above that each wh-phrase is somehow related to an argument of the matrix predicate.

(7) *Studentii mânâncă cine ce a adus lapte.
   *Mânâncă cine ce a adus.
   students.def eat who what has brought
   ‘Mary ate milk’
   ‘Mary ate what she brought.’

Sketch of the analysis

A common approach is to assume that single FRs denote the abstract of the corresponding wh-question, namely a set of individuals, \(\langle e, t \rangle\). To derive this meaning, the wh-phrase is interpreted as a relative pronoun. A type shifter (akin to the) applies to this set returning the unique maximal member of the set (Jacobson, 1995, Caponigro, 2004). By the same logic, the MFRs discussed here denote the abstract of the corresponding multiple wh-question, but crucially on its functional reading. This would mean that before the type-shifter applies, a functional MFR denotes a set of functions, \(\langle\langle e, e \rangle, t \rangle\), as in (9): the set of function from people to things they brought.

(9) \[\text{[who brought what\textsubscript{MFR}]} = \lambda f. \text{[Range(f)=inanimate \& \forall x [human(x) \rightarrow x brought f(x)]}\]

We have two tasks going forward: (I) what is the internal composition of functional MFRs? (II) how do functional MFRs compose with the rest of the clause?

Composing functional MFRs

I propose that functional MFRs have the same underlying composition as multiple correlative constructions, discussed in Dayal 1996. For the internal composition, we can build on the analyses for the semantics of multiple wh-questions on their functional interpretation (Abels and Dayal 2017 and Xiang 2020). I assume an iterated C, such that
C₁ creates a set of propositions and C₂ acts as a ∩-closure (delivering the universal component).

(10) a. \[|C₁|] = λq⟨x,t⟩. p=q \quad b. \[|C₂|] = λQ⟨x,t⟩. \cap Q

Furthermore, I argue that wh-phrases come in 4 varieties: interrogative (∃ quantifier) versus relative (domain restrictor) and individual- versus functional-denoting. With these tools under our belt, I propose the LF in (11) for a functional MFR, delivering the final meaning in (9). The object wh-phrase what moves to C₂ where it is interpreted as a functional relative wh-phrase \([⟨⟨eet, eet⟩]⟩\), namely as a domain restrictor over sets of functions, leaving behind a functional trace, \(f(x)\); this is necessary to derive the final interpretation of a set of functions. The subject wh-phrase who moves to C₁ where it is interpreted as an individual-denoting interrogative wh-phrase \([⟨⟨et,t⟩]⟩\), leaving behind an e-type trace.

(11) \[\text{[THE]} = λF⟨⟨eet, eet⟩] \cdot λG⟨⟨eet, eet⟩] \cdot \exists f⟨⟨eet⟩] \cdot [f=ιg \ s.t. F(g)] ∧ G(f)\]

Applying THE to the MFR delivers a predicate of relations; specifically, it creates a set of relations built off the unique function that holds between individuals and the things they brought. The problem at this point is that the matrix predicate, a transitive verb, is of type \(⟨⟨t⟩⟩\), which is of the wrong type to combine with the type-shifted MFR. In order to resolve this, I propose that predicates can also undergo type-shifting from a type \(⟨⟨e, ⟨e,t⟩⟩\) denotation, (13a), to a functional \(⟨⟨e, ⟨e,t⟩⟩\) denotation, (13b). On this denotation, a transitive verb like eat can be thought of as denoting a set of relations mapping individuals to things they ate.

(12) a. \[[\text{eat} ⟨⟨e, ⟨e,t⟩⟩]\] = λy. λx. [x ate y] \quad b. \[[\text{TSH}]([[\text{eat} ⟨⟨e, ⟨e,t⟩⟩]\] = \lambda f. \forall x [x ate f(x)]]\]

Putting all the pieces together, as in (14a), we derive the right interpretation in (14b): the unique function from people to things they brought such that for each individual in the domain of the function, that individual ate what (s)he brought.

(13) (1) \[\lambda q⟨x,t⟩. p=q\]

(14) a. LF of (1): \[[\text{TSH} \text{eat} \ [\text{THE} \ [\text{who what brought}]])\]

b. \([[1]] = \exists f⟨⟨e⟩] \cdot [f=ιg \ s.t. \ Range(f)=in \ ∧ \ \forall x[\text{hum}(x) \rightarrow x \ brought g(x)] \ ∧ \ \forall x [x \ ate f(x)]]\]

Adjunct MFRs At this stage, the story is more or less complete, with one caveat. While the TSH in (13b) can deliver the right interpretations for two-place predicates, we still need to understand what happens in the case of MFRs with 1 argument and 1 adjunct. Following Barros 2014 I will assume that even implicit non-argumental XPs are syntactically represented.

Conclusion and extensions This abstract provides the first compositional analysis of the interpretation of functional MFRs. It builds on the assumption that there are interrogative and relative wh-phrases, and that these can come in both individual and functional incarnations. Once this assumption is made, the composition proceeds seamlessly once couched within recent proposals for the internal composition of multiple wh-constructions. ∗ Bulgarian MFRs can have both single pair and pair list readings; the suffix -to occurs on both wh-words in the single-pair version (15) but only on the second wh-word in the pair-list one (16). Note that bare wh-words are interrogative, while those suffixed with -to are relative pronouns. The present analysis can derive the difference in meaning between (15) and (16) compositionally.

(15) Koj-to kakvo-to iska, da go vzeme. (16) Koj kakvo-to iska, da go vzeme.

who-TO what-TO wants to it take who what-TO wants to it take
‘Whoever wants something should take it.’ ‘Let each person take whatever they want.’