

Form Copy and Wh-dependencies

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Abstract

Starting from the observation that resumption asymmetries with wh-phrases depend on the status of the latter as D-linked or non-D-linked, in this paper we propose that resumption is restricted to (sometimes concealed) relative clauses. We implement this idea in terms of Form Copy, as defined in Chomsky et al. (2023) for A-dependencies. The theoretical contribution of this paper is thus our extension of the scope of Form Copy to A'-dependencies.

1. Introduction

A well-known asymmetry in languages with clitic doubling concerns clitic doubling of (direct object) wh-phrases, which is only possible with so-called “D-linked” ones (Pesetsky 1987), as illustrated for Albanian in (1).¹

- (1) a. Çfarë (*e) solli Ana?
what CL.ACC.3S brought Ana
‘What did Anna bring?’
b. Cilin libër (e) solli Ana?
which.the.ACC book CL.ACC.3S brought Ana
‘Which book did Anna bring?’

The pattern in (1) is in fact more general in that it is replicated in languages that use other resumptive strategies (see Boeckx 2003). This is shown in (2), where the Hebrew resumptive pronoun occurs only with a D-linked wh-phrase:

- (2) a. *mi nifgaSta ito
who you.met with.him
‘Who did you meet with?’ (Hebrew, Sharvit 1999: 591)

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¹The same asymmetry also holds in Greek (Anagnostopoulou 1994).

- b. eyze student nifgaSta ito
 which student you.met with.him
 ‘Which student did you meet with?’ (Hebrew, Sharvit 1999: 591)

In this paper, we propose, following Kallulli (2012), that resumption is restricted to (sometimes concealed) relative clauses. We implement this idea in terms of Form Copy (FC), as defined in Chomsky et al. (2023) for A-dependencies. The theoretical contribution of this paper is thus our extension of the scope of FC to A'-dependencies (see also Roberts 2024, on extending FC to heads and features of heads).

The paper is organised as follows: first, we present the theoretical preliminaries on Form Copy (Section 2). In Section 3, we give more data on resumption in *wh*-questions and the role of D-linking, drawing on work on Hebrew by Doron (1982) and Sharvit (1999). We then present a case study of Albanian, before looking at English in light of these proposals. Next, we present our analysis. The heart of the proposal is that resumption is restricted to (sometimes concealed) relative clauses (see Kallulli 2012), an idea which we here implement in terms of Form Copy, as defined in Chomsky et al. (2023). In this way, we extend the FC mechanism from A-dependencies, as discussed by Chomsky et al., to A'-dependencies. We also briefly consider further implications of these proposals before concluding.

2. Background on Form Copy

Chomsky et al. (2023: 24) define FC as follows:

- (3) Where X, Y are structurally identical, $FC(X, Y)$ interprets X, Y as copies, i.e. the inscriptions are interpreted in exactly the same way.

The authors go on to show that FC operates under conditions of c-command (X and Y must be in a c-command relation), minimality (enforced by Minimal Search) and internally to a given phase (enforced by the Phase Impenetrability Condition). For example, FC applies in the passive in (4):

- (4) [{ {many, people}, {were, {praised, {many, people}}}]

Here the two occurrences of {many, people} are copies by FC, since the first copy c-commands the second, there is no intervening copy, and, since passive

ν P is defective, they are in the same phase. FC is relevant at both interfaces: at the CI interface copies may be interpreted, accounting for reconstruction and other effects as has been known since Chomsky (1993); in (4), the lower copy determines the thematic role of {many, people}, in that this argument is interpreted as bearing the thematic role appropriate to the internal argument. At the SM interface, only one copy is interpreted; this is almost always the highest one, as in (4). Chomsky et al. further adopt the principle of Preservation, which dictates that Internal Merge can only target non-theta-positions (this is because inscriptions can only be interpreted in one way, and movement to a theta position changes interpretation). FC is active in the derivation of A-movement as we see in the passive in (4), and also in control relations (Chomsky et al. 2023: 34–36). Consider the example in (5):

(5) {{the, man}, {tried {to, {{the, man}, {read, {a, book}}}}}}

Here both occurrences of {the, man} are Externally Merged, as they have different theta-roles and, as we just seen, Preservation prevents movement to theta-positions and hence prevents a single argument from bearing more than one theta role. However, FC is independent of movement. Hence it can in principle apply here. The conditions on FC are all met, in that the higher occurrence of {the, man} c-commands the lower one, there is no intervener and, assuming that infinitival clauses (whether CP or TP) are not phasal, they are in the same phase. So, as Chomsky et al. (2023: 34–36) point out, FC applies without Internal Merge in control contexts, with the lower copy deleted. We thus have the following situation:

- (6) a. FC + IM \rightarrow lower copy is “trace”
 b. FC + EM \rightarrow lower copy is “PRO”

As Chomsky et al. (2023: 45) put it “[w]hat is traditionally referred to as ‘trace’ is the identity relation ensured by FC; while PRO is a separate instance of NP put into the copy relation via FC.” Let us now look at how FC interacts with Internal and External Merge in the A'-system, but first we need to say something more about resumption.

3. More on resumption

3.1. Doron (1982) vs. Sharvit (1999)

In her discussion of resumptive pronouns in Hebrew, Doron (1982) observes that when a trace in a relative clause is c-commanded by a quantified expression, the sentence is ambiguous between a ‘single-individual’ and a ‘multiple-individual’ reading, as illustrated in (7), but if the trace is filled by a resumptive pronoun, the only available reading is the single-individual reading (and as Sharvit 1999: 588 notes “the pronoun in the matrix VP is interpreted as a free variable”), as shown in (8):²

- (7) ha-iSa Se kol gever hizmin __ hodeta lo
 the-woman *Op* every man invited thanked to-him
 a. ‘The woman every man invited thanked him’
 b. ‘For every man *x*, the woman that *x* invited thanked *x*’
- (8) ha-iSa Se kol gever hizmin **ota** hodeta lo
 the-woman *Op* every man invited her thanked to-him
 ‘The woman every man invited thanked him (= *y*)’

Sharvit (1999) points out further interpretive differences between *wh*-questions with resumptive pronouns as opposed to those with *wh*-traces. For example, while the latter allow both functional readings and pair-list readings, the former only allow functional readings and disallow pair-list readings, as shown in (9) and (10):

- (9) ezyo iSa kol gever hizmin __
 which woman every man invited
 ‘Which woman did every man invite?’
 a. et Gila
 ACC Gila
 b. et im-o
 ACC mother-his

²As Sharvit (1999: 588) explains, “[u]nder the single-individual reading in ([7]a), the same woman is associated with all the men, and the pronoun in the matrix VP (namely, ‘him’) is interpreted as a free variable (referring to a particular individual). Under the multiple-individual in ([7]b), each man is paired with a different woman, and the pronoun in the matrix VP is interpreted as a variable bound by ‘every man’.”

- c. Yosi et Gila; Rami et Rina
 Yosi ACC Gila; Rami ACC Rina
- (10) ezyo iSa kol geve^r hizmin **ota**
 which woman every man invited her
 ‘Which woman did every man invite?’
- a. et Gila
 ACC Gila
- b. et im-o
 ACC mother-his
- c. *Yosi et Gila; Rami et Rina
 Yosi ACC Gila; Rami ACC Rina

However, Sharvit (1999) challenges Doron’s (1982) claim that there is a fundamental difference between traces and resumptive pronouns, since the interpretive contrasts presented above are not found in specificational sentences like (11):³

- (11) ha-iSa Se kol geve^r hizmin ___ / **ota** hayta iSt-o
 the-woman *Op* every man invited / her was wife-his
- a. The woman every man invited was his (he = y) wife.
- b. For every man *x*, the woman *x* invited was *x*’s wife

Sharvit (1999) argues that relative clauses in equative/specificational sentences correspond to natural functions, whereas in non-equative/predicational sentences they correspond to lists of arbitrary pairs; hence, although traces are licensed everywhere, resumptive pronouns are licensed only in equative sentences. Therefore “resumptive pronouns support natural function readings but not pair-list questions because natural functions (for whatever reason) are **permissible referents of pronouns**, but sets of arbitrary pairs are not” (Sharvit 1999: 602) [emphasis ours].⁴ Crucially, however, she acknowledges that “[w]e have not said anything about what makes a function ‘natural’, or why pronouns are sensitive to the natural function/pair-list distinction. **I do**

³Indeed Sharvit (1999: 595) states that “[a] pair-list answer is strongly disfavored, even if the second member of each pair happens to be, for example, the mother of the first member”.

⁴The pair-list reading is also a functional reading (of a different kind, Chierchia 1991), i.e. semantic type alone does not differentiate between ‘natural’ functions and sets of (possibly arbitrary) pairs; both are functions from individuals to individuals (type <e,e>).

not know the full answers to these questions. Intuitively, a natural function satisfies a salient function-definition schema.” (Sharvit 1999: 607) [emphasis ours].

To summarise, Sharvit’s analysis rests on the assumption that there is a semantic/pragmatic but not syntactic distinction between natural functions and pair-lists, which goes beyond semantic type denotation, and possibly beyond D-linking, while at the same time admitting the role of salience, which brings us back to D-linking.⁵

3.2. Kallulli (2012)

The central claim of Kallulli (2012) is that resumption is restricted to (sometimes concealed) relatives. More specifically, an example like (2) has the bi-clausal structure shown in (12), containing a null copular construction:⁶

- (12) [CP which woman_k \emptyset _{COP} [DP the one / such (woman_k)]_J [CP that every man invited her_j]]

This analysis straightforwardly derives the grammaticality contrast between (1)a and (1)b. The intuition behind this analysis fits also with other facts discussed in Sharvit (1999) concerning the distribution of different types of (roughly) distributive versus functional readings of relatives in specificational versus predicational contexts (e.g. as discussed above). In addition, this analysis can also account for other facts, such as the obviation of both weak crossover and Principle C effects in constructions with resumptive pronouns (see also Demirdache 1991, 1997, Shlonsky 1992, Safir 1986), as illustrated for Albanian in (13) and (14):

- (13) a. *Cil-in djalë_i pa nëna e tij_i?
 which-the.ACC boy saw.3S mother AGR his
 ‘*Which boy_i did his_i mother see?’ (Albanian)

⁵Sharvit (1999: 592) indeed states that resumptive pronouns “are contextually salient (or perhaps D-linked)”, and that “[a] resumptive pronoun requires a set of permissible values [...] as its discourse antecedent. Semantic type alone does not always distinguish between permissible and impermissible values.”

⁶Similar proposals (i.e., involving a bi-clausal structure) have been made by McCloskey (1990) and Demirdache (1991: 42ff.) for questions with resumptive pronouns in Irish and Arabic, respectively.

- b. Cil-in djalë_i e pa nëna e tij_i?
 which-the.ACC boy 3S.ACC.CL saw.3S mother AGR his
 ‘Which boy_i is such that his_i mother saw *(him_i)?’
- (14) a. *Cil-ën fotografi të Anë_i pa (ajo vetë)_i në
 which-the.ACC picture of Ana saw.3S she herself in
 gazetë?
 newspaper
 ‘*Which picture of Ana_i did she_i see in the newspaper?’
- b. Cil-ën fotografi të Anë_i e pa (ajo
 which-the.ACC picture of Ana 3S.ACC.CL saw.3S (she
 vetë)_i në gazetë?
 herself) in paper
 ‘Which picture of Ana_i is such that she_i (herself) saw it in the
 newspaper?’

Under this analysis, the grammaticality of the Albanian example in (13b) is unsurprising since the *wh*-phrase here *c*-commands the embedded subject *nëna e tij* ‘his mother’ from an *A*-position, therefore binding the pronoun *e tij* ‘his’ in it, as depicted in (15):⁷

- (15) [_{CP} cilin djalë_i është i tillë/ai (djalë)_i] [_{CP} që e_i pa
 which.ACC boy is such/he (boy) that 3S.ACC.CL saw
 nëna e tij_i *pro*]]
 mother AGR his *pro*

Likewise, the lack of Principle C effects in (14b) is straightforwardly accounted for, since under this analysis, the clitic doesn’t double the *wh*-phrase in the matrix clause but an (embedded) bound variable object *pro* (see Sportiche 2006).⁸ Further corroboration for this analysis involves the following facts.

⁷For convenience/brevity, we have glossed *ai* in (15) as ‘he’ but that is actually homomorphic with (masculine) ‘that’ (as in: *that boy*) in Albanian.

⁸A potential problem that arises from this analysis is how to account for accusative case on *cilin* ‘which’ in the relevant examples. In terms of the structure given in (15), *cilin djalë* ‘which boy’ is the subject of the concealed relative clause and so accusative case-marking is unexpected. This is an example of case-mismatch, since the head of the concealed relative shows the case corresponding to its function inside the relative clause. This instance follows directly from the idea that the relative clause and the resumptive *pro* direct-object (and therefore accusative-marked) argument in the main clause are related by Form Copy (see Section 4).

While the *wh*-phrase in (16a), where the clitic is absent, can appear in its putatively base (direct-object) position, the *wh*-phrase in (16b), where the clitic is present, cannot do so:

- (16) a. Ana solli cil-in libër?
 Ana.NOM brought which-the.ACC book
 ‘Ana brought which book?’
 b. *Ana e solli cil-in libër?
 Ana.NOM 3S.ACC.CL brought which-the.ACC book

Final evidence for the correctness of this analysis comes from interpretive differences between the clitic and non-clitic version of (1b), repeated here as (17):

- (17) a. Cil-in libër solli Ana?
 which-the.ACC book brought Ana.NOM
 ‘Which book did Ana bring?’
 b. Cil-in libër e solli Ana?
 which-the.ACC book 3S.ACC.CL brought Ana.NOM
 ‘Which is the book that Ana brought?’

In (17a) the 3Sg Accusative clitic *e* is absent while in (17b) it is present. Both of the examples presuppose that Ana brought a certain book (as predicted under the analysis of which-phrases as definites, cf. Katz & Postal 1964, Kuroda 1969), but while this presupposition can be negated for (17a), it cannot for (17b), as shown in (18):

- (18) a. Cil-in libër solli Ana (në qoftë se solli
 which-the.ACC book brought Ana.NOM (in case that brought
 libër)?
 book)
 ‘Which book did Ana bring (if any)?’
 b. Cil-in libër e solli Ana (#në
 which-the.ACC book 3S.ACC.CL brought Ana.NOM (in
 qoftë se solli libër)?
 case that brought book)
 ‘Which book is such that Ana brought it (#if any)?’

Turning now to English, there are reasons to make the distinction between

resumptive *pro* and *wh*-trace here too. First, Cinque (1990) observes that parasitic gaps are restricted to DPs and, as is well-known, they alternate with resumptive pronouns:

- (19) a. This is a neighbourhood which you should work in before residing **(in)*.
 b. This is a neighbourhood which you should work in before residing in *(it)*.

Although English doesn't generally allow for *pro* in direct-object position or otherwise other than in parasitic gap constructions, there are contexts that require a gap, (20a,b), which contrast with their close paraphrase, the so-called " 'unlyrical' such that" relative (as described by Quine 1960: 110), shown in (20c,d), which need an overt resumptive pronoun:

- (20) a. Which book is of the kind_{*i*} that you like **(it_{*i*})*?
 b. Which book is the one_{*i*} that you like **(it_{*i*})*?
 c. Which book is such that you like **(it)* / **(that book)*?
 d. **Which* book is such that you read (the book)?

Here too we can posit a resumptive *pro* alternating with the overt resumptive pronoun, as Kallulli (2012) argues. This proposal can also explain the lack of weak-crossover effects in appositive relatives (see Safir 1986):

- (21) a. *?*A* man_{*i*} who_{*i*} his_{*i*} wife loves t_{*i*} arrived early.
 b. John_{*i*}, who_{*i*} his_{*i*} wife loves t_{*i*}, arrived early.

(21b) has the structure in (22), with a concealed relative containing a resumptive pronoun (which may be *pro*):

- (22) John_{*i*}, who_{*i*} ~~∅ [DP such / the one]_{*t*}~~ that his_{*i*} wife loves him_{*t*}/*pro_{*i*}*, arrived early.

Further, the proposal can derive the lack of Principle C reconstruction effects with relatives, as in (23):

- (23) The picture of John_{*i*} which he_{*i*} saw in the paper is very flattering.

The contrast between relatives and analogous *wh*-questions in this respect as shown in (24) through (27) (examples from Sauerland 1998 and Safir 1999) is

now expected, given the structure in (28) we assume (still following Kallulli 2012).⁹ In other words, in the (a) sentences the *wh*-phrase neither ‘reconstructs’ in its putative external merging site, nor is it deleted at PF.¹⁰

- (24) a. The picture of John_i which he_i saw in the paper is very flattering.
b. *Which picture of John_i did he_i see in the paper?
- (25) a. The pictures of Marsden_i which he_i displays prominently are generally the attractive ones.
b. *Which pictures of Marsden_i does he_i display prominently?
- (26) a. I have a report on Bob’s_i division he_i won’t like.
b. *Which report on Bob’s_i division won’t he_i like?
- (27) a. In pictures of Al_i which he_i lent us, he_i is shaking hands with the President.
b. *Which pictures of Al_i did he_i lend us?
- (28) [_{CP} [_{DP} The picture_k of John_i [_{CP} which ∅ [_{DP} such / the one (picture_k)]_j [_{CP} that he_i saw it_j/*pro*_j in the paper]]] is very flattering].

However, the (b) examples in (24) through (27) become grammatical with emphatic pronouns such as emphatic *himself*, to which Kallulli ascribes the structure in (30).¹¹

- (29) a. Which picture of John_i did he_i himself see in the paper?
b. Which pictures of Marsden_i does he_i himself display prominently?
c. Which report on Bob’s_i division won’t he_i himself like?
d. Which pictures of Al_i did he_i himself lend us?

⁹Note the alternation between the elements *such* and *the one* in (28). For now, it is not important to distinguish between these two alternatives. What is important here is the existence of a concealed relative clause in the structure. Note also that depending on whether the concealed relative clause is a *such* that or its *the one* that alternative, the bound variable pronoun inside it will be either PF-deleted, or simply null (i.e. *pro*), but at any rate non-overt/phonologically empty.

¹⁰See Citko (2001) for the view that the *wh*-phrase in the (a) sentences in (24) through (27) does not reconstruct but is instead deleted at PF.

¹¹If what is deleted from the matrix C is a null copula, as shown in (ii), and if interrogative C requires PF-realisation (maybe because it contains an abstract affix, cf. Roberts 2023), then *do*-insertion is required. We remain neutral as to the precise mechanisms behind “*do*-support”.

- (30) [_{CP} [_{DP} Which picture_k of John_i] ∅ [_{DP} such / the one (picture_k)]]
 [_{CP} that he_i himself did see it_j/pro_j in the paper]].

But why do emphatic wh-questions pattern with relative clauses while non-emphatic wh-questions don't? That is, what is it that licences the concealed relative clause strategy, why is it available for the (a) sentences in (24) through (27) (as well as for (30)) but not for the respective (b) sentences, since both involve D-linked wh-phrases? Here too we follow Kallulli (2012) in speculating that it is precisely the (concealed) bi-clausal structure of emphatic wh-questions that is responsible for their presuppositional structure, which as mentioned earlier (in the context of the discussion of the Albanian examples in (17) and (18)) and as replicated in (31) for English, is different from that of their non-emphatic counterparts, among other things.

- (31) a. Which book did Ana bring (if any)?
 b. Which book is such that Ana brought it (#if any)?
 c. Which book is of the kind that Ana brought (#if any)?
 d. Which book is the one that Ana brought (#if any)?

Consequently, D-linked wh-phrases come in (at least) two blends, which is exactly how – following Kallulli – we have analysed D-linked wh-questions, namely as structurally mono-clausal versus bi-clausal ones. Thus, the implication of the claim that resumption is restricted to (sometimes concealed) relatives is only one way: resumption with D-linked wh-phrases entails a bi-clausal structure, but bi-clausality does not entail resumption/clitic doubling. This is in line with Sharvit's (1999: 595) observation that "satisfaction of the D-linking requirement alone does not suffice to license a resumptive pronoun". One ramification of this view is that also 'simple' wh-phrases should always have D-linked uses. Though this is sometimes disputed, the well-formedness of sentences like (32) corroborates such an analysis.

- (32) a. What is the thing that John likes?
 b. What are the things John likes?
 c. Who is the one that John likes?
 d. Who are the ones that John likes?
 e. What / who is it (that) John likes?

In this section, we have seen evidence from Albanian and English that in

certain cases the gap linked to a *wh*-phrase can be resumptive *pro* rather than a trace. We now return to the discussion of Form Copy to show how this mechanism can account for these observations.

4. Proposal: Extending Form Copy to A'-dependencies

Let us implement the bi-clausal concealed-relative analysis in terms of Form Copy. An example like (15) would have the form in (15') (here we give just the English morphemes from the gloss to (15)):

(15') [CP [DP *which.ACC boy is such/he (boy)*] [that 3S.ACC.CL saw [mother AGR his [DP *which.ACC boy is such/he*]]]

Here the higher copy of the *wh*-phrase is externally merged as the head of the hidden relative clause, hence there are no reconstruction effects, Principle C effects, weak crossover, etc. The lower copy is deleted and acts like *pro* (and can of course be spelled out as a resumptive pronoun). The higher *wh*-phrase is externally merged in a theta-position: subject of predication, which we take to be standard for the head of a relative clause (see *inter alia* Chomsky 1981).

Two of the three conditions for Form Copy are met: first, it is clear that the higher copy of the relative clause *c*-commands the lower one; second, there is no intervening element that could qualify as a closer copy to the higher relative clause, so the minimality requirement on Form Copy is met. However, the lower copy is in a different phase, *vP*, from the higher one. In order to maintain our analysis, this condition may have to be weakened; it is unclear to us whether both a minimality requirement and a co-phasehood requirement are required. In many cases (for example, superraising in the case of A-movement), these are redundant and so perhaps the co-phasehood requirement can be dropped.

Form Copy applies, making the two *wh*-phrases copies, and the lower copy is deleted. If there is overt resumption, we treat this as a partial copy. Therefore the connectivity, crossover and other effects associated with *wh*-movement do not hold here, as these are the result of *wh*-movement (Internal Merge).¹²

So for the A'-system we arrive at the position in (33):

¹²For an approach to resumption which is very similar in spirit, although framed in terms of different technical assumptions, see Shlonsky (1992), especially his Note 7, p. 453).

- (33) a. FC + IM → lower copy is “trace” (standard wh-movement)
 b. FC + EM → pro/RP (resumption)

Compare (6), from Section 1:

- (6) a. FC + IM → lower copy is “trace”
 b. FC + EM → lower copy is “PRO”

The parallels are clear, and the conclusions seem very natural from a theoretical perspective.

5. Summary and conclusions

Extending FC to the A'-system is a natural move, in fact an inevitable one given the overall goals of current work in the minimalist programme. Here we have pointed out some desirable empirical consequences of this move.¹³ For a further extension to Agree and head-movement, see Roberts (2024).

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¹³A further case where Form Copy may apply in the A'-system concerns partial wh-movement in languages like German, as studied by Gereon Müller in much of his work (see Müller 1995 et seq.).

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