Reverse sluicing in English and Greek

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Abstract

In this article we identify and analyze a novel elliptical phenomenon in English and Greek which we dub reverse sluicing. We show that a complete account of reverse sluicing follows from an extension of the analysis of sluicing proposed in Chung, Ladusaw, and McCloskey (1995). Chung et al.'s operation of IP-copy, which reconstructs a missing IP at LF, supplemented by the standard Heimian analysis of indefinites, can successfully capture the facts in Greek. We discuss the differences between English and Greek and argue that these differences can be reduced to an independent difference in the availability of certain empty categories in the two languages. We claim further that the copy theory of movement (Chomsky 1995) provides a natural account for the restrictions on the interpretation of the indefinite variables involved.

1. The basic phenomenon

We will use the term reverse sluicing for constructions which consist of the apparent coordination of a wh-complementizer with a CP containing a wh-phrase.

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1. We are thankful to Sandy Chung, Bill Ladusaw, Jim McCloskey, Chris Wilder, and the two TLR reviewers for very helpful discussion, as well as to numerous native speakers of both languages for judgments. For stimulating comments, we would also like to thank the audience of GLOW 19 in Athens, where parts of this material were presented. The first author's research was partially supported by NWO grant R-4313 and the CLCG (Center for Language and Cognition Groningen) and the second author's in part by NSF grant SBR-9510868; this support is hereby gratefully acknowledged.

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in its specifier like those in (1) and (2).² There is a basic contrast between English and Greek with respect to what the wh-phrase in SpecCP can be: in English, only adjuncts are licit, while in Greek, both adjuncts and arguments are possible.

(1) a. [adjunct]
   It's not clear if and when the police arrested the demonstrators.
   b. [argument]
   *It's not clear if and who the police have arrested.

(2) a. [adjunct]
   Dhen ine akomi safes an ke pote sinelave i astinomia
   not is yet clear if and when arrested the police
   tus dhiaxtiates.
   the demonstraters.
   'It's not clear yet if and when the police arrested the demonstrators.'
   b. [argument]
   Dhen ine akomi safes an ke pijon sinelave i astinomia.
   not is yet clear if and whom arrested the police
   'It's not clear yet if the police arrested someone and who it was.'
   lit. 'It's not clear yet if and whom the police arrested.'

Data like these have to our knowledge been overlooked in the literature both on embedded questions and coordination. Kathol (1995: 158–159), however, (following Reis 1985: 301) mentions similar data in German, as in (3). He suggests that these data are evidence for a unitary left-peripheral position in subordinate clauses in German, an instance of head-Xp coordination (in Comp, essentially):

(3) Ob und inwiefern dass interessant ist, wage ich nicht zu beurteilen.
   if and in how much that interesting is, dare I not to judge
   'I don't dare judge if and to what extent that is interesting.'

Without going into the details of Kathol's account, we note here that such a head-Xp coordination approach encounters a number of difficulties in many analyses of coordination (cf. Munn 1993, among others) and it does not provide a simple mapping to the semantics of these structures.

² We limit the scope of this investigation to these types of conjunctions solely for space reasons. As noted by a reviewer, and explored in Merchant (1990), there is a natural extension of our analysis to cases of seeming adjunct-adjunct coordination such as When and how did Abby climb the mountain?, which contrast with non-wh-adjuncts, fronted or not: ?On Tuesday, and by skirting the north face Abby climbed the mountain.

The idea that we will pursue in this article is that configurations like (1)–(3) instantiate instances of CP-CP coordination as in (4), where the complement to the first C is an elided IP.

\[
\begin{array}{c}
\text{CP} \\
\text{CP}_1 \quad \& \quad \text{CP}_2 \\
\text{C'} \\
\text{XP} \\
\text{IP} \\
\end{array}
\]

We propose that the interpretation of the missing IP in the first conjunct is supplied by copying the overt IP of the second conjunct. This is a case of surface anaphora (in Hanks and Sag's 1976 sense), and is resolved by Chung et al.'s LF-operation of IP-copying. After the overt IP of CP₂ has been copied into the empty complement of the wh-complementizer in CP₁, we have the representation in (5):

\[
\begin{array}{c}
\text{CP} \\
\text{C'} \\
\text{IP} \\
\end{array}
\]

Before turning to details of the analysis of reverse sluicing, let us briefly review the relevant portions of Chung et al.'s account of sluicing.

2. Sluicing

Chung et al. propose an account of sluicing which makes use of three LF operations: IP-copy (or "IP-recycling"), sprouting, and merger. Here we will examine only the two basic cases: sluicing of adjuncts, and sluicing of arguments.

2.1. Sluicing of adjuncts

Adjunct sluices are illustrated in (6) and (7). In these cases, an adjunct wh-phrase ("where", etc.) appears where an embedded CP normally would, and is taken as modifying some IP present in the linguistic context.
2.2. Arguments

The primary case of sluicing of arguments which will be of interest to us here is the sluicing of overt (vs. implicit) arguments. In these cases, the wh-phrase in the sluice corresponds to some argument in the antecedent IP. Chung et al. call this antecedent argument the "inner antecedent". This kind of sluicing is illustrated in (9) (from Chung et al. 1995: 250) and (10).

(9) Joan ate dinner with someone, but I don’t know with whom.

(10) I Roxani malose me kapion ala dhen ksero me pjon.
    the R. argued,3SG with someone but not know,1SG why/
    potep/ ja pjo logo],
    when/ for what reason
    ‘Roxani argued with her husband, but I don’t know why/when/what
    for.’

Chung et al. analyze these as involving IP-copy, which copies in an antecedent IP under the null complementizer, and sprouting. Sprouting is a freely available structure-building operation which is subject to interpretability conditions at LF. It supplies the empty category in the copied IP which is bound by the displaced wh-phrase. Chung et al. hypothesize that sprouting is not unconstrained: it respects the argument structure of the predicates involved, and respects the category of the wh-phrase. After IP-copy and sprouting, the second conjunct in (6b) will have the following LF:

(8) ... 

Merger will only be possible when the inner antecedent can be bound by the Q-operator, that is, when the inner antecedent provides a variable which is free in the domain of that operator. Therefore sluicing will be possible with unroofed weak DPs, because they contribute free variables, but it will fail with necessarily quantificational DPs, as well as with rooted, weak DPs, and DPs that specify reference, because these do not provide the required free variable for binding. These restrictions are illustrated in (12) (from Chung et al. 1995: 254); see Chung et al. for more discussion.

(12) a. *Joan ate dinner with [most students, every student in her class, John, nobody] and we’re all wondering (with) who.
   b. *Frank told his mom that he didn’t talk to anyone, but she still asked him who.
   c. She always reads a book at dinnertime. We can’t figure out what/which one. (only wide scope for a book)

As expected, the CP containing the wh-phrase in the sluice is interpreted as a full interrogative clause. A straightforward mapping between syntax and semantics is envisioned with the following crucial ingredients:

(13) i. an interrogative C (the locus of the Q-operator)
    ii. the wh-phrase in SpecCP (the restriction)
    iii. the copied IP (the scope)
This analysis assumes the familiar semantic theory of restricted quantification (Lewis 1975; Kamp 1981; Heim 1982), where quantificational structures are tripartite, consisting of an operator $O$ which supplies the force of the quantification, a restriction, and a scope.

\[(14)\]  

$O_{x,y} . \text{resi} . (x,y) . \text{scope} . (x,y)$

Following Berman (1991), constituent questions are also tripartite quantificational structures:

\[(15)\]

a. ... which demonstrator the police arrested  
b. $\text{Ap}[\exists x : \text{demonstrator}(x) . \text{p} = \text{[arrest}(\text{police'}, x))]$

The restriction in a sluice will be provided by the content of both the $w$-phrase in SpecCP and the content of the inner antecedent, via merger.

With this brief background in sluicing, we are now ready to turn to an examination of reverse sluicing.

3. Reverse sluicing in English

As noted above, the basic observation to be accounted for with respect to the English data is that reverse sluicing occurs with adverbials, broadly speaking, but not with arguments. Cases of reverse sluicing with adverbial $w$-phrases are illustrated in (16)-(19) for temporal, locative, manner, and reason adverbials, respectively.

\[(16)\]

a. The journalist want to know if and when the suspect will make a statement.  
b. Frank wondered whether and which day the guests would arrive.

\[(17)\]

a. Holmes set out to discover whether and where Moriarty might set a trap.  
b. The city council met to decide if and in which district the new bridge should be built.

\[(18)\]

a. Magdalena worried about whether and how to break the news to her father.  
b. Paul wanted to know if and how easily this spot might wash out.

\[(19)\]

a. The journalists couldn't find out whether or why the letters might have been sent.  
b. The journalists couldn't find out whether or for what reason the letters might have been sent.

Although there is some variation subject to speaker preference, there doesn't generally seem to be any appreciable systematic difference in acceptability between reverse sluices with if vs. whether.

Turning our attention now to cases of coordination with arguments, we see that reverse sluicing is impossible with subjects, direct objects, and objects of prepositions.

\[(20)\]

a. *Lucy was wondering whether and who might come to her party.  
b. *The reporters asked if and who the FBI had arrested.  
c. *The babysitter discovered whether and who Laurie had talked to.

The relevant notion of argumenthood extends to other selected complements such as PPs and selected manner and locative adverbials. We see in (21) that reverse sluicing is equally unacceptable in these cases:

\[(21)\]

a. *We found out whether and on what materials the company relied.  
b. *Tony's mother asked if and how (well) he had behaved.  
c. *I asked you if and where you lived.

Implicit arguments of various sorts are also difficult to find in reverse sluices for many speakers, though there is more variability in judgments in this domain. We will have nothing to say about these differences here. We illustrate the situation in (22) for indefinite implicit arguments (which do allow sluicing, however, as documented in Chung et al.) and in (23) for definite implicit arguments (see Fillmore 1986).

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4. A note on the English data may be in order here. Some speakers find some of the examples of reverse sluicing in English slightly degraded. The examples (or ones equivalent in all relevant aspects) in this paper have been checked with an average eight native speakers of American English. We suspect that the slight degradation in judgments with some speakers derives from a register clash: while this type of coordination, due to its complexity, is not particularly common in colloquial speech and is more frequently found in more formal settings, it is nonetheless considered stylistically inelegant by prescriptive standards and is often paraphrased or otherwise reformulated in carefully written and edited texts (though it is attested in semiformal writing especially, e.g., newspaper articles). Jim McCloskey (p.c.) also points out that similar facts were noticed informally and widely accepted in the early 1980s in GPSG work on coordination, though to our knowledge, none of these facts made it into print.

5. The only difference we’ve observed is related to the well-known contrast between if and whether in supporting infinitival complements.

\[(i)\]

a. The intern want to [whether/*if] to perform the procedure.  
b. The intern asked the chief resident to determine [whether/*if] and how to perform the procedure.

This contrast is expected under the structures we assign to these coordinations, if the relevant constraint mitigating against the use of if with infinitival complement clauses applies after IP-copy at LF. It is not immediately clear how to adapt such a constraint to a view of these coordinations which takes them to be some kind of complex Comp head, as Kathol (1995) does.
(22) a. It was unclear whether and which songs the band would play.
    b. The ranger needed to know if and what kind of game Sam wanted to hunt.
    c. Sam asked if and what he should bake for the party tomorrow.

(23) a. *The runner was unsure if and what leg of the race he would win.
    b. *It's anyone's guess if and what the censors will approve.
    c. *I can't remember whether or which patient he had bathed/shaved.

Accounting for the ungrammaticality of reverse sluicing with arguments is straightforward. Let us examine the LFs that would result from an application of IP-copy, taking (20b) as our example. IP-copy copies the overt IP into the empty complement of the wh-complementizer, yielding (24):

(24) [CP if [IP the FBI had arrested t₁]] and [CP who, [IP the FBI had arrested t₁]]

In (24) however, t₁ in the copied IP is unbound; it therefore violates interpretability requirements, and gives rise to ungrammaticality. This account extends to the other examples involving displaced argument wh-phrases. For the implicit argument cases, we follow Chung et al. who show that the argument structure of a predicate cannot be changed under IP-copy (hence their preference for the term "IP-recycling" — the material in the copied IP is literally "reused" in interpreting the missing IP). This means that the intransitive use of the predicates in (22) and (23) cannot be substituted under IP-copy for the transitive use, with an overt argument, in the second conjunct.

The remaining analytical question given this account of the ungrammaticality of reverse sluicing with arguments is why reverse sluicing with adjuncts is licit. If IP-copying were the only operation available to generate the LFs of reverse sluces, the asymmetry in grammaticality would be inexplicable, assuming that the LFs of the adjunct cases are fully parallel to those of the argument cases, as in the following example from [1]:

(25) [CP if [IP the police arrested the demonstrators t₁]] and [CP when, [IP the police arrested the demonstrators t₁]]

As in (24), the trace of the moved wh-phrase in the copied IP is unbound and would be expected to give rise to ungrammaticality, contrary to fact.

We propose that the adjunct cases are saved by the reverse operation to sluicing: pruning. This pruning operation should be understood strictly in the context provided by Chung et al.'s sluicing, and not in the sense of the S'-pruning conventions or the like of the syntactic literature in the 1970's. Taking sluicing to be simply a general LF-structure altering operation, we might expect the corresponding deletion mechanism to be available as well (cf. the discussion in Lastnik and Saito 1992 and others of a generalized Affect-α as subsuming Move-α and Delete-α). Pruning is subject to the same kinds of general constraints on its application as sluicing is: just as a sluiced category must satisfy the licensing constraints imposed by lexical items within the copied IP, pruning likewise cannot alter the argument structure or delete lexically licensed adverbials. As the reverse of sluicing, then, it will apply only to eliminate adjuncts and not arguments, just as sluicing can supply binders for adjuncts but not arguments.

In (1a), pruning will excise the unnecessary empty PP node in the copied IP, yielding the LF in (26):

(26) [CP if [IP the police arrested the demonstrators]] and [CP when, [IP the police arrested the demonstrators t₁]]

Since this cannot be done for argument traces ex hypothesi, these traces will remain unbound at LF.

The operations of sluicing and pruning should be understood as part of a more general theory of deviances from strict identity allowable under ellipsis. The main goal of any theory of ellipsis must be to describe and account for the types of interpretations which are available to elided elements. Although it is an old observation that certain types of ambiguity must be resolved in the same way in ellipses and their overt counterparts (see Sag 1976 among others), it is equally well-known that the interpretations of ellipses need not be identical in all respects to those of their antecedents. While most of the literature has concentrated on the kind of deviancy that goes under the rubric of strict/sloppy pronoun interpretations, and some attention has been paid to the syntactic/morphological variances permitted in the forms of the verbs in VP-ellipsis, the present cases indicate that there is another area in which the reconstruction of an antecedent into an ellipsis site need not correspond in every way to the form and interpretation of its overt manifestation. We expect therefore that any comprehensive theory of elliptical deviancy will have to incorporate operations or devices corresponding to sluicing and pruning as conceived of here.

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6. Another possible approach would be to follow Higarty (1991) in assuming that adjunct wh-phrases leave no traces internal to the origin IP at all. We have chosen not to pursue this option here, since we think it runs into a number of difficulties in accounting for VP- vs. IP-level interpretations of adjuncts (see Johnston 1994, Stroik 1992). As a reviewer points out, the arguments/adjunct asymmetry observed here is reminiscent of the asymmetry found in the reconstruction of relative clauses vs. CP arguments of means described in Lebeaux (1988). It is not immediately obvious though how the mechanism proposed in Chomsky (1995) to account for that difference could be extended to the cases under consideration here.
4. Reverse sluicing in Greek

We turn now to an examination of the distribution of reverse sluicing in Greek. Greek differs from English in allowing reverse sluicing with both adjuncts and arguments. The examples in (27) illustrate reverse sluicing with temporal, locative, manner, and reason adjuncts, respectively.

(27) a. *Dhen ine akomi safes an ke [potepija mera] sinelave i 
not is yet clear if and [when/which day] arrested.3SG the 
astinomia tis dhiadhilotes. 
police the demonstrators
'It's not clear yet if and [when/which day] the police arrested the demonstrators.'

b. *Dhen mathame telika an ke [pu' se pio meros] kriovatane 
not know.1PL finally if and [where/in which place] hid.3SG 
i Theodora. 
the Theodora
'We didn't know for sure if and [where/in which place] Theodora was hiding.'

c. *Dhen ine akomi safes an ke [pos/me pjon tropa] tin 
not is yet clear if and [how/with which manner] her 
apetismi. 
fired.3PL
'It's not clear yet if and [how/in what way] they fired her.'

not is clear if and [why/for which reason] her married.3SG 
'It's not clear if and [why/for what reason] she married her.'

In (28) we give examples of reverse sluicing with arguments: subjects, objects, and selected PPs:

the N. want.3SG PART know.3SG if and who called.3SG
'Nikos wants to know if anyone called and who it was.'
lit. 'Nikos wants to know if and who called.'

b. *Dhen ine akomi safes an ke pjon sinelave i astinomia. 
not is yet clear if and who arrested.3SG the police
'It's not clear yet if the police arrested someone and who it was.'
lit. 'It's not clear yet if and whom the police arrested.'

c. *Dhen ine akomi safes an ke pjos dhiadhilotes 
sinelave i 
not is yet clear if and who demonstrators arrested.3SG the 
astinomia.
police
'It's not clear yet if the police arrested some demonstrators and who they were.'
lit. 'It's not clear yet if and which demonstrators the police arrested.'

d. *Dhen ine safes an ke se pjes gnostes theories tha stivasti 
o not is clear if and with which known theories will rely.3SG the 
Andreas.
Andreas
'It's not clear if Andreas will rely on famous theories and which these theories will be.'
lit. 'It's not clear if and on which famous theories Andreas will rely.'

Since reverse sluicing with arguments is not an option in English, the immediate question is why it is possible in Greek.

5. Explaining the difference: Null indefinite arguments

We link the possibility of argument reverse sluicing in Greek to the availability of certain types of null indefinite DP arguments in the language. We propose that arguments can be reverse sluiced in Greek but not English because Greek possesses null (argumental) indefinite DPs while English does not. The trace of the displaced argumental *wh*-phrase can be treated as one of these null indefinite DPs and can be interpreted as such.

5.1. Null indefinites and *wh*-traces

Greek exhibits a phenomenon we will call indefinite argument drop. We understand indefinite argument drop as a descriptive label for the phenomenon whereby an argument, here a subject or an object, may be dropped under identity with an indefinite antecedent, i.e., when the antecedent is a weak DP (in the sense of Milford 1974). In Giannakidou and Merchant (1997), we discuss the phenomenon of indefinite argument drop, concentrating primarily on its manifestation with respect to objects. We will take our proposal there as the point of departure here. (29) provides a partial illustration of indefinite argument drop: the understood object in the answer A is equivalent to the overt object in
the question Q.7

(29) Q: Efere o Andreas merika vivila? 'Did A. bring several books?'
kappa
liga
dheka
tulaxiston tria
kanena vivila?
tipota?

A: Ne, (*ta) efere.
yes (them) brought.

'Yes, he brought {several, some, a few, ten, at least three books, some book, something, *them}'.

Since clitic pronouns are linked to referential (strong) readings of DPs, the unacceptability of the clitic in (29A) further illustrates the necessarily weak interpretation of the antecedent DP. In all cases, the missing argument is itself also interpreted weakly, as a Heimian indefinite with the quantificational force of its antecedent.

In Giannakidou and Merchant (1997), we analyze indefinite argument drop as an instance of indefinite DP-ellipsis which involves a null indefinite nominal element pro (for analyses of non-DP elliptical categories as null pronominal elements see Haik 1987, Chao 1987, Lobeck 1991 among others). As is exemplified in the translation of (29A), where Yes, he bought several e can arguably be analyzed as involving noun phrase (NP) ellipsis, English allows for NP-ellipsis but not for indefinite DP-ellipsis; we may therefore conclude that English lacks this empty nominal category. The characterization of the null indefinite DP as pro is simply a useful mnemonic convention, and should be understood as indicating the [-anaphoric, +pronominal] values of the empty DP as a whole. It should not be taken to identify this kind of null indefinite argument with the definite subject pro familiar from the study of null subject languages (which is referential or generic; cf. the papers in Jaeggi and Safir 1991 in general and Condoravdi 1989 for Greek in particular).

On this analysis, the answer in (29A) contains an indefinite pro and it has the (pre-)LP representation given in (30):

(30) efere [IP pro ]

7. Unlike Portuguese and Chinese (see Huang 1984), Greek does not allow definite object drop. The present cases also differ from the cases of topic drop in Spanish discussed in Campos (1986) and Luján (1996). For a detailed exhibition of the data and an analysis see Giannakidou and Merchant (1997).

Returning now to the reverse sluicing cases, we propose that the wh-trace in a copied IP is interpreted as such an indefinite pro, as in (30). Yet given that wh-trace variables are in the standard typology (i.e., [-anaphoric, -pronominal] empty categories), the question arises as to how they end up being interpreted as pronouns. It appears we need a mechanism for converting traces into pronouns in LF, that is, for capturing the equivalence class behavior of certain traces and pronouns in LF. This pattern, however, is not novel. It is for exactly such cases that Fiengo and May (1994) propose their operation of vehicle change, which we summarize briefly in (31):

(31) Vehicle change (Fiengo and May 1994: 218f.)
Nominals can be treated as nondistinct with respect to their pronominal states under reconstruction [ellipsis resolution at LF].

At this stage in our understanding of ellipsis resolution, vehicle change is a little more than a name for the phenomenon and not a fully-worked out theory of it. Yet it is clear that such deviances from identity exist under ellipsis, and play a real role in the grammar, as Fiengo and May take pains to show.

The relevant instantiation of vehicle change for present purpose will convert the trace to its pronominal correlate as in (32), the general schema for which is given in (33):

(32) [-a, -p] (wh-trace) = [-a, +p] (pro).

where = stands for "is equivalent under LF-ellipsis resolution to".

(33) [-pronominal] = [+pronominal]

Vehicle change, like sprouting and pruning, is restricted by properties of the lexicon: in Greek, which has indefinite pro, the change licensed by vehicle change is licit, while in English, which lacks this pro, the product of vehicle change will be illicit. Since English lacks this option, it follows that reverse sluicing with arguments will not be possible.

After IP-copying and vehicle change, the LF for the first conjunct of (28b), repeated here as (34a), will be that given in (34b):

(34) a. Dhen ine akomi safes an ke pion sinelave i astinomia.
not is yet clear if and who arrested the police
'It's not yet clear if the police arrested someone and who it was.'

b. [CP an [IP sinelave i astinomia [IP pro]]]

This accounts for the syntactic well-formedness of these structures in Greek. But this is not quite enough to derive all aspects of their interpretation. For example, the first embedded conjunct of (28c), repeated here as (35a), is interpreted not as meaning simply "whether the police arrested some person" (35b), but rather "whether the police arrested some demonstrators" (35c).
(35)  a. Dhen ine akomi sakes an ke pjuw dhiadhilotes sinelave i not is yet clear if and which demonstrators arrested.3sg the astinomia.
    police

    "...if the police arrested some demonstrators and who they were."

b. \( \lambda p \, \phi \equiv \forall (\exists x \, \text{person}(x)) \, \text{arrest}(\text{police}, x) \) 

c. \( \lambda p \, \phi \equiv \forall (\exists x \, \text{demonstrator}(x)) \, \text{arrest}(\text{police}, x) \) 

Apparently, the converted wh-trace contributes its descriptive content to the interpretation of the conjunct, in the form of the restriction on the indefinite variable. This is expected under Heim’s (1987) analysis of wh-traces as indefinites as well as under the copy theory of movement (Chomsky 1995). Adopting this theory, the wh-trace will in fact contain the descriptive content of the moved wh-phrase. The copied IP is given in (36), where the descriptive content remains in the null DP licensed by vehicle change.

(36)  \( [c^p \text{ an }]_p \text{ sinesav i astinomia } [i^p \text{ dhiadhilotes}] \]

The present approach thus provides independent motivation both for analyzing wh-traces as indefinites and for a particular conception of the copy theory of movement, namely one where the descriptive content of a wh-phrase, but not the quantificational force contributed by the wh-operator, remains in situ as part of the trace itself.

5.2. Roofing effects in reverse sluicing

The idea that wh-traces in reverse sluicing are indefinite DPs has some interesting consequences. Recall the general constraint on sluicing which requires that there be a free variable available for binding by the Q-operator residing in C. From this constraint it follows, as we pointed out in 2.2, that the inner antecedents of sluices must be weak (i.e., variable-contributing DPs) and that the involved variables must be free. If a variable is already bound by some quantificational element, sluicing will be impossible. This fact features prominently in Chung et al.’s analysis where it is characterized as a roofing effect (see Ladusaw 1994). This effect is also visible in non-elliptical contexts:

(37)  a. Lucy said that Mark didn’t read a book, but she couldn’t tell me which one it was.

b. = \( \exists x \, \text{book}(x) \)

c. \( \exists x \, \text{book}(x) \)

In (37a) the indefinite ‘a book’ must have wide scope with respect to negation, as in (37b), in order for ‘which one’ to be able to establish an anaphoric link with it. If the narrow scope interpretation of the indefinite, as in (37c), is necessary for independent reasons, as with the polarity item any, the anaphoric link between the indefinite and the wh-phrase cannot be established, resulting in deviance:

(38)  ‘Lucy said that Jim didn’t read any book, but she couldn’t tell me which one it was.

Similarly in reverse sluicing, the indefinite wh-trace must have wide scope with respect to other operators in the elided clause. We illustrate this in two environments: with negation and adverbs of quantification.

With sentential negation, the indefinite must take scope over negation, as in (37) above:

(39)  I Sofia theli na mathi an ke pjo fitti idhe the S. want.3sg part know.3sg if and which student not saw.3sg o Pavlos.

the Pavlos

‘Sophia wants to know if and which student Pavlos didn’t see.’

\( = \exists x \, \text{student}(x) \rightarrow \text{see}(P, x) \)

\( \exists x \rightarrow \exists x \, \text{student}(x) \rightarrow \text{see}(P, x) \)

Likewise, the indefinite must scope over an adverb of quantification (3 > usually, *usually > 3):

(40)  I Sofia theli na mathi an ke pjo periodhiko krefitizi the S. want.3sg part know.3sg if and which magazine browse.3sg sinthos o Andreas meta to fagito, usually the A. after the meal

‘Sophia wants to know if Andreas usually browses a magazine after dinner and which one it is.’

These contrasts are expected under the current approach, which assimilates the copied trace to a Heimian indefinite, since the scope of such indefinites is

8. Chung et al. claim that roofing effects also arise with intervening quantifiers. This claim is not uncontroversial, however (see Nishigauchi 1998 for some discussion). It seems in fact that a narrow scope interpretation of the indefinite is at least marginally available both in the relevant sluicing and reverse sluicing cases:

(i)  ‘Every student read some book, and I can tell you exactly which ones.

(ii) I epitrop theli na mathi an ke pjo vidoxun disanice kalhe fitti.

the committee want.3sg part know.3sg if and which book read.3sg every student

\( \exists \forall \, \exists \forall \)’

‘The committee wants to know if every student read a book and which ones they were.’

We note this as another case where a similarity between sluicing and reverse sluicing is evident.
exactly that which Chung et al. show to be sensitive to the roofing effects of intervening negation and quantificational adverbs.

6. Comparison with Right Node Raising

At first glance, some of the phenomena we have grouped under the rubric of reverse sllicing might seem to be cases of Right Node Raising. In this section, we explore this possibility and compare reverse sllicing to Right Node Raising. From the comparison it will become evident that there are a number of reasons that reverse sllicing cannot easily be reduced to Right Node Raising.

Right Node Raising is an ellipsis phenomenon found in coordination which affects parts of nonfinal conjuncts. Just as in reverse sllicing, the ellipsis site in Right Node Raising appears in the nonfinal conjunct and is licensed by overt material in the final one, as illustrated in (41):

(41) a. Lucie bought e, and Alfred read [today’s newspaper].
   b. Lucie bought [today’s newspaper] and Alfred read [today’s newspaper]

We follow the analyses of Swingle (1995) and Wilder (1995), who argue convincingly that Right Node Raising is prosodically constrained deletion. If reverse sllicing were to be reduced to Right Node Raising then we would expect it to exemplify the same properties as Right Node Raising. Below, we examine these properties one by one.

6.1. Intonation

Right Node Raising has a very characteristic intonation, generally consisting of a constrastive stress or list-intonation, followed by a substantial pause at the end of each host remnant (see Swingle 1995 for discussion). This property is observed for Right Node Raising in English (see [42]) as well as in Greek (see [43]). In the (b) and (c) clauses the contrastive stress is indicated by the upper-case letters and the pause by the commas:

(42) a. Frank wondered if, and if so, when [the guests would arrive].
   b. […if, and if so, WHEN, …]
   c. […if, and if SO, WHEN, …]

(43) a. I Sofia theli na mathi an, ke an ne, pjio: [ihe the S, want 3sg part know 3sg if, and if yes, whom saw 3sg o Pavlos].
   b. [an, ki an na, PJON]
   c. [an, ki an NE, PJON]

Example (44) illustrates reverse slicing. As we see in (44a, b), the intonation characteristic of Right Node Raising is absent, these examples having a rather even intonational contour over the complementizer and the wh-phrase, not essentially different from the intonation attested in isolation.

(44) a. Frank wondered if and when the guests would arrive.
   […if and when…]
   b. I Sofia theli na mathi an ke pjio idhe the S, want 3sg part know 3sg if, and whom saw 3sg o Pavlos.
   the P.
   […an ke pjio…]

If the function of the intonational contour in (42-43) is to signal the prosodic constituency required in Right Node Raising, then its absence in reverse slicing is expected under our analysis.

6.2. Wh-complementizer vs. non-wh-complementizer contrasts

Reverse slicing is not possible with a non-wh-complementizer, as we see in (45). We attribute this to the fact that the phenomenon occurs only with predicates selecting an embedded question. Right Node Raising is constrained only by prosodic identity and is hence oblivious to this distinction; we see this in (46), where coordination with the non-wh-complementizer oti 'that' is allowed.

Reverse slicing

(45) *I dhimisiografia enathan oti ke pjio dhitahtotes silevalve the journalists learned 3pl that and which demonstrators arrested 3sg i asistinomia the police
   lit: 'The journalists found out that and which demonstrators the police arrested.'
Right Node Raising

(46) *Dhennine akomi safes pote ke an sinelave i astionia tus not is yet clear when, not even if, arrested.3sg the dhiadhitotes.

who.Pl arrested.3sg the police

‘The journalists found out that the police arrested some people but they didn’t manage to find out who.’

lit. ‘The journalists found out that, but they didn’t manage to find out who, the police arrested.’

The contrast carries over to English, where Right Node Raising but not reverse sluicing is marginally possible with a non-wh-complementizer (see Bresnan 1974, Swingle 1995 for discussion of the marginality of this type of Right Node Raising, which is due to the Right Node Raising restriction on contrastiveness).

(47) *I didn’t remember that or when Jack got married.

(48) a. ‘I’ve been wondering whether, but wouldn’t want to positively state that, your theory was correct.

b. ‘Lucy claimed that, but couldn’t say exactly when, the strike would take place.

6.3. Ordering effects

In Right Node Raising constructions, the order of the conjuncts may be altered without any significant consequence for the grammaticality of the sentence. Note that in (49) below, which is marked with the appropriate Right Node Raising intonation, both orders are legitimate: (a) wh-phrase + wh-complementizer, and (b) wh-complementizer + wh-phrase:

(49) a. *Dhennine akomi safes pote, uke kan AN, sinelave i not is yet clear when, not even if, arrested.3sg the astionia tus dhiadhitotes.

who.Pl arrested.3sg the police

‘It’s not clear yet when, not even WHETHER, the police arrested the demonstrators.’

b. *Dhennine akomi safes an, poso malon POTE, sinelave i not is yet clear if, what perhaps when, arrested.3sg the astionia tus dhiadhitotes.

who.Pl arrested.3sg the police

‘It’s not clear yet WHETHER, let alone WHEN, the police arrested the demonstrators.’

In (50) we see what we can call an ordering effect in reverse sluicing: the order wh-phrase + wh-complementizer is excluded, for arguments as well as for adjuncts. This effect holds in English as well, as seen by the ungrammaticality of the English equivalents given in place of glosses.

(50) a. *Dhennine akomi safes pote ke an sinelave i astionia tus

who.Pl arrested.3sg the police

‘It’s not clear yet which of the two propositions correspond to their (true) answers (see Karttunen 1977; cf. Groenendijk and Stokhof 1982). Polar questions denote a set which consists of two propositions: a negative and an affirmative one. This is illustrated in (51b, c) (abstracting away from tense):

(51) a. Did Paul see Lucie?

b. Ap [p \= \{\text{saw} (Paul, Lucie)\}] = A

c. A= \{Paul saw Lucie, Paul didn’t see Lucie\}

At the time of utterance, the speaker cannot decide which of the two propositions in A supplies the true answer to (51a). Constituent questions, on the other hand, denote (possibly infinite) sets of propositions which have the tripartite structure given in (52b) (for the latter, see Berman 1991):

(52) a. Who did Paul see?

b. Ap [\exists x: \text{person}’ (x)] [p \= \{\text{saw} (Paul, x)\}] = A

c. A= \{Paul saw Lucie, Paul saw Kim, Paul saw Lucie and Kim, …\}

When uttering (52a), the speaker has already decided that Paul saw somebody is true, but he or she is uncertain with respect to the part of it that corresponds to the restriction in (52b). Because of their semantics, in other words, polar and constituent questions give rise to different presuppositions. The former presuppose ignorance of the truth or falsity of the interrogated propositional content, whereas the latter presuppose its truth. We see her the effects of the general constraint of informativeness, which requires that information proceed from
general to partial. In the present cases, this rules out the presupposition clash that would arise if the true were to precede the undefined.

In Right Node Raising, however, this presuppositional conflict can be voided by the nature of the coordination, through the use of presupposition-reversing particles such as ‘even’ or ‘let alone’; see Horn (1972).

6.4. Multiple Right Node Raising

In general, Right Node Raising cannot apply in a right-node-raised constituent, as is illustrated in (53):

(53)  a. *Nathan chose, and Lucy paid for, [a book for their nephew about, and a video on, [sea-dwelling dinosaurs]].
    b. ??The lawyer wanted to know [if, and if so, where [Nathan said he kissed, and Lucy claimed he had bit, [his wife of 25 years]].

If reverse sllicing were Right Node Raising, we would expect it to behave accordingly and thus (54) to be ungrammatical, contrary to fact:

(54)  The lawyer wanted to know [if and where Nathan said he kissed, and Lucy claimed he had bit, [his wife of 25 years]].

6.5. Implicit argument differences

Certain predicates that license implicit arguments can be embedded in a final IP under Right Node Raising, as seen in (55a,b). Of course, when the predicate does not license implicit arguments the result will be ungrammatical (hence the contrast between eat and ingest in [55a]):

Right Node Raising

(55)  a. The surgeon needed to know if, and if so, what [the patient had \[eaten/ingested\] before the operation].
    b. Ben’s dad asked him if, and if so, for whom [he had been baking].

As we have seen, however, predicates that allow implicit arguments are degraded in reverse sllicing for many speakers:

Reverse sllicing

(56)  a. ??The surgeon needed to know if and what the patient had [eaten/ingested] before the operation.
    b. ??Ben’s dad asked him if and for whom he had been baking.

If the two phenomena were identical, this difference in grammaticality would be quite unexpected.

6.6. Nonfinal conjunct interpretation

As mentioned at the beginning of this section, we follow recent accounts of Right Node Raising that analyze it as PF-deletion of strings in nonfinal conjuncts under prosodic identity with a string in the final conjunct. Under an analysis of reverse slicing as Right Node Raising, sentences where an argument is reverse sliced, like (57a) below, present a serious difficulty. It is hard to see how the IP-domains could be prosodically identical in both conjuncts, given that if they were, the first conjunct would be assigned the wrong interpretation:

(57)  a. Pes mou amemos an ke pjos [ekripse ta kliidia] tell.2SG me immediately if and who hid.3SG the keys
         ‘Tell me immediately if anybody hid the keys and who it was.’
    b. Pes mou amemos an *[ekripse ta kliidia] ke pjos [ekripse ta kliidia]

The first conjunct in (57a) contains a referential pro subject and the second contains the trace of the subject wh-phrase pjos. For the phonology, there is no difference between a null pronoun and a trace, hence the requirement on phonological identity is satisfied, and deletion could proceed as illustrated in (57b). In such a situation, however, given the referential status of subject pro, the interpretation of the first conjunct in (57b) would have to be about a particular individual, something like “tell me whether he hid the keys”. But this is not what this conjunct means. The whether-clause is not a question about whether a particular individual, say Paul, hid the keys; rather, it is a question as to whether any individual did. We see, then, that the prosodic identity approach to reverse sllicing makes the wrong predictions in these cases.

To sum up, in this section we have considered the possibility of analyzing reverse sllicing as an instance of Right Node Raising. Examination of a number of diagnostics has made it clear that reverse slicing differs from Right Node Raising in many important respects. Many of the differences between the two phenomena, however, have a somewhat gradient nature, and it may be the case that reverse slicing and Right Node Raising are two ends of a scale, with minimal construction specific properties. Nevertheless, we remain convinced that there is a qualitative difference between the two constructions, namely that Right Node Raising is phonological ellipsis (PF-deletion), while reverse slicing is true syntactic ellipsis (resolved by LF-copying).10

10. This dichotomy recalls the similar distinction drawn in Wilder (1995), where the directionality properties of the two types of ellipsis are investigated in much greater detail than here.
7. Conclusion

The analysis of reverse sluicing in English and Greek presented in this article has led to a number of interesting conclusions. First, we have provided independent motivation for Chung, Ladusaw, and McGloshkey's 1995 operation of IP-copy, and shown how this approach in conjunction with the copy theory of movement and the Heimian theory of indefinites can account for the interpretation of the missing IP. This approach was seen to be superior to a PF-deletion approach assimilating reverse sluicing to Right Node Raising, which differs from reverse sluicing in a number of respects.

The difference between English and Greek with respect to argument licensing in reverse sluicing was reduced to an independent difference between these two languages in the availability of null indefinite DPs. A wh-trace in a copied IP in Greek but not in English can be interpreted as such a null indefinite by virtue of vehicle change.

As with any initial investigation into novel territory, we have had to leave a number of questions and issues for future research. The exploration of many of these issues will also, we hope, shed light on more general questions in the theory of ellipsis and refine our understanding of the nature of elliptical resolution.

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