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THE COMP-TRACE EFFECT AS AN INDIRECT DEPENDENCY

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Abstract

This paper discusses two peculiar differences surrounding long-distance dependencies in English, Dutch and German: German and Dutch employ various alternatives to long-distance movement, so-called scope marking constructions, which seem to be absent from English. Conversely, English markedly differs from Dutch and German in showing a strong COMP-trace effect (the mandatory deletion of complementizers in subject LD question). For scope marking structures in German and Dutch, a type of indirect dependency analysis is adopted in which the embedded clause is formally akin to a relative clause. It is then argued that complementizer deletion in English (i.e. the COMP-trace effect) actually instantiates scope marking: the absence of a complementizer signals the presence of a subject contact relative clause. Evidence in favor of this analysis comes from non-identity effects: in English, the putatively LD extracted *wh*-phrase is able to carry oblique case, which conflicts with the case it should have been assigned in the embedded clause.

Keywords: COMP-trace effect, scope marking, long-distance movement

1. Introduction^{1,2}

In generative grammar, the phenomenon of long-distance (LD) movement has first (and foremost) been discussed for English. It is probably for this reason that this is somehow seen

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as the “standard” for forming an LD dependency, an option made available by Universal Grammar. But from an empirical point of view, LD movement is actually not such a prolific phenomenon across languages, and many languages employ alternative strategies to form an LD dependency. Some of these alternatives are illustrated in the Dutch examples in (1) – (4), where (1) shows “standard” LD movement and (2) – (4) various alternatives that are (at least functionally) related.

- (1) Wie denk je dat ik zie?
Who think you that I see
- (2) Wat denk je wie ik zie?
What think you who I see
- (3) Wie denk je wie ik zie?
Who think you who I see?
- (4) Van wie denk je dat ik hem zie?
Of whom think you that I him see?
All: Who do you think I see?

“Standard” LD movement as in (1) involves movement of a *wh*-phrase from a subordinate clause into a superordinate clause. The examples in (2) and (3) are so-called “scope marking” constructions: (2) is commonly known as partial *wh*-movement and (3) as *wh*-copying, a terminology that I will keep using throughout this paper. In a partial *wh*-movement construction as (2), the “real” *wh*-phrase appears in the intermediate, formally non-interrogative CP. The matrix clause is introduced by a kind of dummy *wh*-phrase (*wat*) which somehow forms a link with *wie*. In the *wh*-copy construction in (3), we see something similar, but here the lower and higher *wh*-phrase look identical. The construction in (4) is known as resumptive prolepsis. Here, the *wh*-phrase is base-generated in the matrix clause, and there is no gap in the embedded clause. Instead, we find a resumptive pronoun in this position. Variants like (2) –(4)

can be found in various Germanic languages, such as Frisian, German, Afrikaans, but also in languages unrelated to Germanic, like Hungarian. Hungarian in particular shows a very rich plethora of LD formation strategies, which have recently been extensively discussed in Den Dikken (2018). The different types of LD movement constructions show that there is more than one way of forming a dependency between a *wh*-phrase in a matrix clause and a dependent in an embedded clause. In (1), the dependency is created by movement, but in (4), the dependent is a (resumptive) pronoun, and the dependency shows no sensitivity to locality. Therefore, the dependency does not seem to result from movement, but binding (cf. Salzmann (2006) and (2017) for extensive discussion of this construction). For the constructions in (2) and (3), on the other hand, the field has seen a heated debate with respect to their specific syntactic and semantic analyses. I will discuss this in more detail in section 2, focusing on German and Dutch. I will adopt a so-called indirect dependency approach for these constructions, in which the underlying base of the construction is a relative clause. The *wh*-phrase in the embedded CP is therefore not an interrogative pronoun, but a relative pronoun. I will then turn to English in section 3, where I will propose that English has a similar type of scope marking construction. Particularly, I will argue that complementizer deletion in English subject LD questions (i.e. the *that*-trace or COMP-trace effect) actually instantiates scope marking, more specifically that it is akin to *wh*-copy constructions: the absence of a complementizer signals the presence of a subject contact relative clause. In section 4, I will present evidence in favor of this view by arguing that English LD subject questions show non-identity effects: the putatively LD extracted subject *wh*-phrase is able to carry oblique case, which cannot be explained under a standard LD movement analysis. In section 5, I will discuss a number of potential questions and problems that my analysis might raise, then I will close with a conclusion.

The proposal I will advance here is able to solve a number of long-standing puzzles surrounding LD constructions in English: first of all, it shows that English is no different from its Germanic neighbors in also allowing scope marking constructions. Secondly, the analysis provides a novel analysis of the COMP-trace effect: this should not be seen as a case of complementizer deletion that somehow magically saves an otherwise illicit structure. Instead, the absence of a complementizer signals the presence of a scope marking construction. Thirdly, the analysis is able to explain a peculiar phenomenon in English, namely that putatively LD extracted subject *wh*-phrases may show up with oblique case.

2. Analyses of scope marking constructions

For the constructions in (2) and (3), two main types of analyses can be distinguished, which are known as the so-called Direct Dependency Approach (DDA) and the Indirect Dependency Approach (IDA). The DDA assumes that the higher and lower wh-phrase stand in a direct relationship and are part of the same movement chain. This essentially reduces scope marking to a spell-out phenomenon. Several DDAs assume that the lower wh-phrase receives matrix scope at LF through mechanisms like coindexation, LF movement and absorption (Beck & Berman, 2000; Brandner, 2000; D’Avis, 2000; Höhle, 2000; McDaniel, 1989; Müller, 1997; Pafel, 2000; Stechow, 2000), whereas in other (Minimalist) approaches, scope marking constructions have been analyzed as partial feature movement (Cheng, 2000; Hiemstra, 1986) or partial feature spell-out (Barbiers et al. 2008; 2010a; 2010b). The DDA faces several problems. Generally speaking, it remains a mystery why an LD movement chain would be spelled out this way: scope marking constructions do not seem to be motivated by interface requirements (e.g. prosodic or interpretational reasons) and they are not computationally simpler than LD movement constructions. Furthermore, scope marking constructions and LD movement constructions have been claimed to differ in several respects (island sensitivity, matrix predicate restrictions and interpretational differences) which is hard to explain under the assumption that the constructions have virtually identical structural and semantic representations. The competing analysis is known as the Indirect Dependency Approach (IDA), first proposed by Dayal (1994; 1996; 2000), based on Hindi but extended to German as well. She proposed that the scope marker originates as the true object of the matrix verb. Having interrogative force of its own, it quantifies over propositions. The embedded clause, in turn, is analyzed as a true wh-question as well. Following standard semantics of wh-questions, questions can be translated into sets of propositions. Dayal argues that the set of propositions represented by the embedded clause functions as the restriction to the set of propositions that the highest wh-phrase quantifies over.

Felser (2001) points out that there are two problems with Dayal’s IDA. Firstly, Dayal assumes the embedded clause is adjoined to the matrix clause rather than being a complement. However, Felser gives convincing arguments that in German, this is not the case: pronouns in the embedded clause can be bound by matrix clause arguments, and there’s a fairly strict

adjacency requirement between the matrix verb and the embedded clause. These facts strongly suggest that the embedded clause is a complement, not an adjunct. Secondly, under Dayal's analysis, the lower CP can also be a yes/no question. For Hindi, this is indeed possible, but the German scope marker does not combine with yes/no questions. To overcome these problems, while at the same time retaining the main ingredients of the IDA (base-generation of the matrix wh-phrase in matrix clause object position, indirectly linked to the embedded wh-phrase), Felser proposes the following: the scope marker and the embedded CP together form a complex predicate: the embedded clause predicates over the scope marker, which semantically functions as the subject of predication. The scope marker originates in the matrix VP, specifically in the specifier of VP, and functions as the theme of the matrix verb. The embedded clause is the complement of V, but no longer functions directly as the theme of the matrix verb (but only indirectly in the sense that it predicates over *was*). Since the relation between the scope marker and the embedded clause is now one of predication, the construction formally resembles a relative construction.

The existence of a relative-clause type indirect dependency for forming an LD dependency has been proposed for other languages as well. Den Dikken (2018) applies Felser's analysis to partial wh-movement constructions in Hungarian. Furthermore, he extends the analysis to wh-copy constructions as can be found in languages like German and Dutch. Making use of the idea that the lower and the higher wh-phrase undergo concord, it is actually a small step to extend Felser's indirect dependency analysis to wh-copying (although she does not do so herself, in fact, for wh-copying, she assumes a direct dependency analysis (cf. Felser, 2004). According to Den Dikken (2018), the difference between partial wh-movement and wh-copying is that in the latter case, there is not only concord for interrogative features, but also for the phi-features of the lower wh-phrase.

Koster (2009) also proposes an indirect dependency analysis for scope marking constructions in Dutch. His analysis differs from Felser (2001) and Den Dikken (2018) in that he assumes that the matrix clause contains a concealed cleft, and that the matrix predicate + subject are parenthetical (i.e. something along the lines of *wie denk je ~~is het~~ wie je gezien hebt?* 'who ~~is it~~ you think who you have seen?').

For French, Koopman & Sportiche (2014) have proposed an indirect dependency analysis for LD subject questions that show the *que/qui* alternation. The traditional analysis of

this alternation assumes that the special complementizer *qui* that is used for LD subject questions is a special agreeing complementizer that licenses an embedded subject trace (i.e. it is assumed that the complementizer has undergone agreement with the embedded subject, by which it becomes spelled out as *qui* rather than *que*). However, Koopman & Sportiche argue that the special *qui* strategy does not involve LD movement proper at all, but that it is symptomatic of the existence of a relative clause-type indirect dependency. For a French subject question like (5) below, they propose the embedded clause is a pseudo-relative small clause (PRSC) of which the highest *qui* is the head. The embedded *qui* is thus considered to be a relative pronoun, rather than an agreeing complementizer.

- (5) [Qui tu crois [PRSC t_{qui} [qui dort]]
 Who you think who sleeps
 ‘Who do you think sleeps?’

Summarizing, the more recent IDAs assume that scope marking constructions are formally relative clause constructions in which the embedded clause is a relative clause that predicates over the scope marker. The higher wh-phrase (the scope marker) and lower wh-phrase (relative pronoun) can (in some proposals) undergo concord, so that they are able to share features. In this paper, I will essentially adopt an analysis of scope marking constructions along the lines of Felser (2004) and den Dikken (2018), but with some minor modifications. I will focus on German and Dutch, treating the languages somewhat interchangeably and assuming the analysis of scope marking constructions works pretty much the same in both languages.

For partial wh-movement, Felser and Den Dikken assume the lower and higher wh-phrase undergo concord for an interrogative [wh] feature. However, I don’t see why the embedded wh-phrase should be endowed with an interrogative feature. Formally, the lower clause is a relative clause, so the wh-phrase is not an interrogative pronoun but a relative pronoun. One argument to claim that the lower pronoun undergoes interrogative concord may be because it is spelled out as a wh-pronoun: relative pronouns in German and Dutch are normally d-pronouns, not w-pronouns. However, this is not always the case: when relative clauses don’t have a full nominal head, i.e. in cases of free relatives or “light-headed” relatives (Citko, 2004), w-pronouns are generally preferred over d-pronouns. In scope marking

constructions, the “head” of the relative clause is not a full nominal head but a wh-pronoun. This likely explains why the relative clause is introduced by a w-pronoun, not a d-pronoun. Felser herself also points out that in her analysis of partial wh-movement, the lower CP formally resembles a free relative clause (Felser, 2001, p. 29). Other than “interrogative concord”, partial wh-movement constructions do not really show any evidence for feature sharing/agreement/concord relations between the lower and the higher wh-phrase. I therefore see no reason to assume any kind of syntactic dependency (such as concord) between the higher and lower wh-pronoun. In fact, I would like to propose that this is exactly what differentiates partial wh-movement from wh-copying: in the latter, there is a concord (agreement) relation between the scope marker and the lower wh-phrase for Φ -features and, at least in German, case-features as well. That means that the dependency between the scope marker and the embedded CP is only created in the semantics, through the predication relation, but that there is no syntactic dependency between the scope-marker and the lower wh-phrase (e.g. through concord). This is completely in the spirit of the original indirect dependency approach.

For wh-copy constructions, on the other hand, I would like to argue that they do undergo agreement/concord. This can be implemented by assuming that a different type of scope marker is used in the wh-copy construction. In partial wh-movement constructions, the “scope marker” is a contentful wh-phrase (German *was* or Dutch *wat*) with its own set of Φ and case-features, therefore capable of receiving a thematic role. For the wh-copy construction, however, it seems that the scope marker doesn’t have any Φ and case features of its own: it inherits these from the lower wh-phrase. Therefore, I would like to propose that the scope marker in a wh-copy construction is an unmarked wh-phrase stripped of all its features except and operator feature, and that it therefore needs to undergo agreement with an element that can provide it with Φ and case features. In order to formally implement this, I will use ingredients from the proposal for wh-dependency formation by Adger & Ramchand (2005).

Adger & Ramchand propose that what all pronouns have in common is that they have to be able to identify a referent. They formally implement this by assuming all pronouns have a so-called identification feature [ID], which makes it possible for them to function as variables. For wh-pronouns, they assume that they carry an operator feature [Λ] as well. This allows an operator-variable chain to be created when a wh-pronoun moves (assuming the operator feature is interpreted at the top of the chain and the variable feature at the bottom). Adger & Ramchand

assume that the same kind of dependency can in principle be created by agreement alone, since under Minimalist assumption, Move is parasitic on Agree. This means that the [Λ] and [ID] features can also be base-generated in different positions, after which they undergo agreement. Adger & Ramchand's system gives us an interesting option of explaining how and why agreement (concord) takes place in a wh-copy construction. In their proposal, the [ID] feature can enter the derivation either valued or unvalued. In the latter case, the lexical item carrying the unvalued feature [ID:] will have to undergo agreement with a matching, valued [ID] feature. Regular wh-pronouns have an [ID] feature that is valued with the Φ -features of the pronoun [ID: Φ]. For partial wh-movement constructions, I have assumed (following Felser), that the highest wh-pronoun (i.e. German *was*, Dutch *wat*) is a contentful object pronoun. That means that it has its own set of Φ and case features, i.e. it has valued [ID] features. The lower wh-phrase (formally a relative pronoun) also has its own set of valued [ID] features. For this reason, the scope marker and the lower wh-pronoun do not undergo agreement at all. For wh-copy constructions, on the other hand, I would like to propose that they have an unvalued [ID] feature [ID:]. This forces them to undergo agreement with an element carrying matching [ID] features, which would be the lower wh-pronoun, that has its [ID] features valued [ID: Φ]. This would result in what Den Dikken describes as concord. At least in German, it seems to be the case that there is (obligatory) concord for case-features as well, i.e. the lower and higher wh-phrase have to be case-identical (cf. Den Dikken, 2018; Pankau, 2014).³ In effect, this results in the lower and higher wh-phrase being virtually identical, giving rise to the idea that they are copies of one another. However, as the German example in (6) shows, the higher and lower pronominal must not be identical: the lower pronominal can also be a d-pronoun (McDaniel 1986, pp. 183-4; Pankau (2014:50):

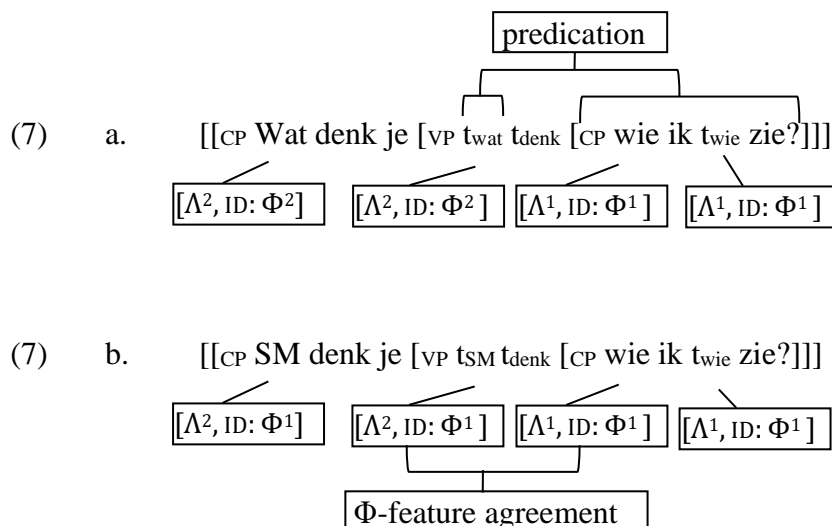
- (6) Wen glaubst du den sie gesehen hat?
 who believe you who she seen has
 'Who do you think that she has seen?'

Similarly, Dutch wh-copy constructions can also feature a d-pronoun in the embedded CP (Barbiers et al. 2008; 2010a; 2010b and Boef 2013). Pankau points out that his German informants that allow d-pronouns in wh-copy constructions also allow free variation of d-

pronouns and w-pronouns in free relatives. This correspondence follows naturally under the assumption that the lower clause is formally a relative clause without a full nominal head. Because the scope marker in a wh-copy construction appears to be a scope marker in the true sense, i.e. just a simple wh-operator, I also assume it does not receive a theta role from the matrix verb, contra to *was/wat* in a partial wh-movement construction. This would also make sense from a semantic point of view, as otherwise the scope marker in a wh-copy construction would be interpreted as the object of the matrix verb.

Summarizing what I have said so far: In both partial wh-movement and wh-copy constructions, the scope marker originates in the specifier of the matrix VP. However, in the partial wh-movement construction, it is a true object pronoun carrying Φ -features of its own. Therefore, it does not stand in any type of syntactic dependency with the lower wh-phrase. In the wh-copy construction, on the other hand, the scope marker is a wh-pronoun without any Φ -features of its own, which is formally represented by it having an unvalued [ID] feature [ID: \emptyset]. For this reason, it will undergo Φ -feature agreement with the wh-phrase in the lower clause. In the partial wh-movement construction, the link between the lower and higher wh-phrase is made indirectly in the semantics, through the predication relation. In the wh-copy construction, the lower and higher wh-phrase stand in an agreement relation, because the scope marker has unvalued [ID] features. The wh-copy construction can therefore be seen as a type of hybrid between partial wh-movement and LD movement, which intuitively seems to make sense.

The derivation of the partial wh-movement question in (2) and of the wh-copy construction in (3) is given in (7a) and (7b), respectively.



In the partial wh-movement construction, the lower and higher wh-phrase each come with their own $[\Lambda]$ and $[\text{ID}:\Phi]$ features, which I have indicated by means of superscripts so that it becomes clear that there is no agreement/copying of $[\text{ID}:\Phi]$ features between the scope marker and the lower wh-phrase. Following Adger & Ramchand (2005), I will assume that interpretable features in an Agree/Move chain are interpreted only once (Interpret Once under Agree, IOA): the $[\Lambda]$ feature in the left peripheral scope position and the $[\text{ID}:\Phi]$ feature in the argument position. For a partial wh-movement construction, there are two separate movement chains, one in the main clause and one in the embedded clause, so we will end up with two separate $[\Lambda]$ features (in the lower and higher SpecCP) and two $[\text{ID}:\Phi]$ features (in the matrix clause object position and the embedded clause object position, or in embedded subject position when it's a subject wh-question). The lower operator-variable chain will turn the embedded clause into a predicate, whereas the higher operator-variable chain turns it into a question. In the wh-copy construction, there are also two separate movement chains, but they are linked to one another through agreement. This opens up an interesting possibility for the analysis of wh-copy constructions: it is a construction that takes relativization as a base, but because of the agreement between the scope marker and the relative pronoun, we end up with a syntactic object that looks virtually identical to an LD movement chain. Assuming the principle of IOA sees the two connected movement chains as one long chain, all but one of the $[\Lambda]$ features and one of the $[\text{ID}:\Phi]$ features would survive deletion: the $[\Lambda]$ feature in the matrix SpecCP and the $[\text{ID}:\Phi]$ feature in the embedded clause argument position. In other words, semantically we would end up with an operator-variable chain that is identical to what would have been created by LD movement. This is a welcome result, since semantically, wh-copying seems to pattern more with LD movement than with partial wh-movement (see Schippers, 2012, Chapter 4 for an overview of the differences between partial wh-movement, wh-copying and LD movement).

3. English subject LD questions as scope marking constructions

All the Germanic languages most closely related to English seem to employ scope marking constructions, not only (High) German and Dutch, but also Frisian (Hiemstra, 1986), Low German (Hopp et al., 2019) and Afrikaans (Du Plessis, 1977). In English, however, scope marking constructions are notably absent. This is somewhat of a mystery, also considering the fact that scope marking constructions are so wide-spread crosslinguistically. At the same time, English differs from its Germanic neighbors in frequently omitting the complementizer in LD movement constructions. In case of LD subject movement, this is even obligatory, and known as the so-called *that*-trace or COMP-trace effect:

(8) Who do you think (*that) called me?

What I would like to propose here is that these phenomena are related, more specifically that the COMP-trace effect actually does not involve LD movement proper, but signals a scope marking construction. Specifically, I claim that examples like in (8) should be analyzed on a par with *wh*-copy constructions: the highest *wh*-phrase is a scope marker that enters the derivation with an unvalued [ID] feature [ID:]. Furthermore, I propose that the embedded clause is a subject contact relative clause that contains a null pronoun endowed with Φ -features. This null pronoun is able to provide the Φ -features to the scope marker under agreement, so that the scope marker ends up being spelled out as a regular *wh*-pronoun with Φ -features. In effect, I argue that English has scope marking constructions, just like its Germanic neighbors, but that the relevant difference is that English uses zero relatives, and German and Dutch do not. This ultimately boils down to a lexical difference that independently exists between English and German/Dutch: English has zero relatives, and German and Dutch do not.

The idea that the lower clause in sentences like (9) is a (subject) relative clause may seem counterintuitive, since subject relative clauses in (standard) English cannot be zero, i.e. they exemplify a so-called anti-*that* trace effect.

(9) That's the man *(that) saw me

However, subject relatives without *that* or a relative pronoun are not completely absent from English; they occur in a special type of relative known under the name of subject contact clauses or subject contact relatives (Jespersen, 1933). I propose that the type of relative clause used in English LD subject questions is indeed such a subject contact relative.

Subject contact relatives occur in a wide variety of dialects of English, and their syntactic distribution is limited. They mainly seem to occur in it-clefts, in existential and copular sentences, and as the complement of verbs like *to know*. Some examples from Doherty (2000, pp.71-72) are below:

- (10) a. There's a man wants to see you.
- (10) b. Was it him did it?
- (10) c. That's the girl wanted to see you yesterday.
- (10) d. I knew someone years ago used to do that.
- (10) e. It was Bill did it.

Henry (1995) suggests that the contexts in which subject contact clauses can occur is not so much syntactically determined, but discourse dependent: the matrix clause introduces new individuals in the context (the “head” of the subject contact clause) and the contact clause states something about that individual. Regular (restrictive) relative clauses don't seem to have this restriction and have a much wider distribution. Henry (1995) and Den Dikken (2005) have proposed that subject contact clauses are not relatives at all, but topic-comment structures. Doherty (2000), Haegeman (2015) and Haegeman et al. (2015) on the other hand, propose that they are true relative clauses. I will here adopt the latter position and assume that they are relative clauses with a null pronominal. In line with what Doherty (2000) proposes for subject contact relatives, I assume that the embedded clause does not feature null operator movement. The null pronoun is therefore a base-generated variable. This null pronoun is endowed with Φ -features, which is evident from the fact that the verb of subject contact clauses shows agreement for person and number in English. When subject contact relatives occur in scope marking constructions, the scope marker with its unvalued [ID] feature [ID:] will undergo agreement with the null pronominal in the embedded clause, which carries a matching [ID] feature valued [ID: Φ]. The main difference between English on the one hand and German and Dutch on the

other is therefore that the lower clause in English has a null pronominal, instead of a relative pronoun.

The derivation for a scope marking construction in English is illustrated in (11). In (11a), we see the structure at the point in which the scope marker is merged in the specifier of the matrix VP. In (11b), we see the final result of the derivation: the scope marker has undergone agreement with the lower *pro*, copying its Φ -features, after which it moves to the matrix SpecCP. Under IOA, the [ID: Φ] feature is interpreted at the position of the *pro* in the embedded clause, and the [Λ] feature in the matrix clause scope position. Because the scope marker has copied the Φ -features of the lower *pro*, it will end up being spelled out as *who* (or *what*, dependent on the Φ -features of the lower null pronoun).

- (11) a. $[_{VP} \text{ SM think } [_{CP} \text{ pro called me}]]$
 $\begin{array}{ccc} | & & | \\ \boxed{[\Lambda, \text{ID: }]} & & \boxed{[\text{ID:}\Phi]} \end{array}$
- (11) b. $[_{CP} \text{ SM do you } [_{VP} \text{ think } [_{VP} \text{ t}_{SM} \text{ t}_{think} [_{CP} \text{ pro called me}]]]]$
 $\begin{array}{ccc} | & & | & & | \\ \boxed{[\Lambda, \text{ID: } \Phi]} & & \boxed{[\Lambda, \text{ID: } \Phi]} & & \boxed{[\text{ID:}\Phi]} \end{array}$

Again, similarly to what I have argued for German *wh*-copy constructions, we will end up with an operator-variable chain that is virtually identical to the one that would have been created by standard LD movement. Because of IOA, only the highest copy of the [Λ] feature will be retained and the lowest copy of the [Φ] feature. Unlike German, however, the surface structure is superficially indistinguishable from an LD subject question with complementizer deletion (i.e. the mainstream analysis of LD subject questions). This raises the question of whether we can find any independent evidence for the idea that English subject LD questions are scope marking constructions. I will argue in the next section that this is indeed the case. English LD subject questions can show non-identity effects, in particular in terms of case-marking: the *wh*-phrase in the matrix clause can occur with oblique case (i.e. it can be spelled out as *whom*), consistent with the idea that it originates as a scope marker in the matrix clause VP.

4. Case mismatches in English LD subject questions

A peculiar phenomenon in English is that putatively LD extracted subjects sometimes show up in the oblique form *whom*, rather than *who*, in other words, the matrix wh-phrase carries case features that do not match those of the alleged gap site. This is by no means a recent development: the OED gives the earliest example from the 11th century (Whom, 2019). The occurrence of subject-*whom* has been discussed in a variety of works, both purely descriptive in nature as well as in formal works. Below is an example from the Corpus of Contemporary American English (COCA, Davies 2008):

(12) Whom do you think better understands the needs and problems of people like you?

Such uses of *whom* are often considered to be cases of hypercorrection (cf. Schepps, 2010). If that is the case, a reasonable expectation would be that the frequency of hypercorrect *whom* is lower than the frequency of correct uses of *whom*, i.e. in cases where the wh-phrase unambiguously corresponds to an embedded object gap. Therefore, I investigated how often *whom* is used in LD constructions with the matrix verb *think* and *say* + a pronominal subject in the COCA (excluding cases where *whom* is the complement of a preposition). Since LD (subject) wh-questions were relatively rare, I also looked at LD subject relatives, for which I assume a scope marking analysis should also be possible. I will comment on this issue in some more detail in the section 5.2. For wh-questions (Table 1), *whom* is quite rare and only attested with *think*, but for relatives (Table 2) it is rather frequent. For wh-questions as well as LD relatives with *think*, there are no significant differences in the use of *whom* and *who* in subject vs. object extractions, which means that the (putative) wh-subject is overtly case marked for oblique case just as often as true objects. For LD relatives with *say*, however, *whom* even occurs more frequently in subject than object relatives [$X^2(1, N = 600) = 15.39, p < .001$].

Table 1: LD Wh-questions with *think*

	Subject	Object
Who	415	530
Whom	8	4

Table 2: LD relatives with *think* and *say*

Verb	<i>think</i>		<i>say</i>	
	Subject	Object	Subject	Object
Who	529	444	222	314
Whom	43	27	43	21

Concluding, *whom* is used just as often (and sometimes more often) for subjects as for objects in LD constructions. This makes it very unlikely that we are dealing with a form of hypercorrection.

Various explanations have been offered for the occurrence of subject-*whom*. Kayne (1980) proposes that the matrix verb assigns accusative case during an intermediate movement step in the embedded CP. There are two problems with this analysis: first, the embedded SpecCP is an A'-position, which is normally not a position in which case is assigned. Secondly, it raises the question what happens with the nominative case of the embedded clause (which is either not assigned, or overwritten). Kayne (2005) and Armstrong & Mackenzie (2012) alternatively propose that the construction in question is a special case of Exceptional Case Marking (ECM). However, this still does not explain what happens with the nominative case of the embedded clause: since the embedded clause is finite, it should assign nominative case. After all, this is the reason why ECM is only considered to occur with subjects of non-finite clauses. Furthermore, *think*, by far the most frequent verb in LD dependencies (cf. Dąbrowska 2008; Schippers 2012) is not an ECM verb (at least not in the sense in which it is typically used in LD contexts, i.e. as a mental activity). I therefore conclude that these explanations are unsatisfactory.

Under the indirect dependency analysis proposed here, however, the facts follow naturally. Under this analysis, the highest wh-phrase in subject LD dependencies is syntactically a matrix clause object. Thus, it follows that it can receive oblique case and can therefore be spelled out as *whom*. English is in this respect no different from other languages with indirect dependencies that are able to morphologically mark case on wh-pronouns. In Hungarian, scope marking constructions also show up with accusative case-marking on the highest wh-phrase (cf. Horvath, 1997) – this was one of the major motivations to analyze this construction as an indirect dependency. Finally, Koopman & Sportiche (2014) claim that in LD

subject relatives in certain southern dialects of Dutch (for which they also propose an indirect dependency analysis), the highest relative pronoun surfaces as accusative *dat*, rather than nominative *die*. In sum, the English phenomenon illustrated in (12) does not stand on its own: it shares this with indirect dependencies in several other languages as well. The long-standing puzzle of subject *whom* in LD questions not only receives an explanation under the current analysis, but is actually predicted by it.

5. Remaining issues

The analysis that I have proposed here for subject LD questions (and by extension, the COMP-trace effect), is novel and will undoubtedly raise many questions. In this final section, I want to address some of these issues and sketch possible answers and solutions.

5.1 Absence of subject contact relatives from standard varieties of English

I have argued that subject contact relatives are being used in LD subject questions, and that the so-called COMP-trace effect is not simply a case of complementizer omission but signals the presence of a subject contact relative. However, subject contact relatives are not widely accepted and used in present-day English, and generally considered absent from standard varieties. This poses a potential conundrum. However, I think the situation can plausibly be explained by taking a diachronic perspective. In particular, I would like to propose that the introduction of the COMP-trace effect in English lead to the development of an alternative construction, which consisted of scope marking, using subject contact clauses as a base.

Historically speaking, the COMP-trace effect was not always active in English. At least in Old English, it appears to be absent (Allen, 1980; Bergh & Seppänen, 1994). According to Jackson (2006), the COMP-trace effect became active somewhere between 1100 and 1400. Bergh & Seppänen conducted a corpus study using the Helsinki Corpus of English texts and date the specific turning point to the first half of the 13th century. At that point, subject contact clauses were much more frequent than in present day English. In fact, they were more frequent for subject than for object relatives (Dekeyser, 1986). There appeared to be quite some variation

in their distribution across speakers, which according to DeKeyser is not only ‘dialectally, but also stylistically and even idiolectally determined’ (DeKeyser, 1986, p.110). DeKeyser (1990) states that subject contact clauses mainly seem to occur in works of a colloquial nature, but are absent from (formal) Latinate registers. What can be concluded from this is that subject contact clauses were a wide-spread phenomenon of the English language at the time the COMP-trace effect emerged, not confined to a collection of dialects. I will leave open for now what exactly caused the COMP-trace effect to become active. It seems to be part of a much larger, crosslinguistic ban on extracting clause-initial subjects from embedded clauses. A clause-initial subject position seems to be “special” in some respect in that this position cannot be easily vacated. Whether this is due to something like a “Subject Criterion” (cf. Rizzi & Shlonsky, 2007), due to the topic-status of subjects (Bayer, 2005) or perhaps even due to a processing factor (such as sentence planning, cf. McDaniel et al. (2015)) is something I cannot discuss in detail here. For convenience, I will just assume there is a certain constraint X that disallows movement of clause-initial subjects to structurally higher positions. Because this constraint became effective somewhere in the Middle English period, the need for an alternative strategy arose. This alternative came in the form of a scope marking construction, for which subject contact clauses formed a base. Because subject contact clauses contain a base-generated null pronoun that does not move, the construction functions as a work-around for a COMP-trace violation. The diachronic scenario sketched here could plausibly explain why subject contact clauses “survived” in LD constructions, but are no longer used in their original function in standard varieties of English, assuming they went on a separate grammaticalization path in scope marking constructions.

5.2 Scope marking in LD constructions other than LD subject questions

Complementizer deletion does not only occur in LD subject questions in English: it is also very frequent in object LD questions. Furthermore, the COMP-trace effect is not confined to *wh*-questions, it also occurs in other types of LD dependencies, such as relative clauses. This raises the question whether all forms of complementizer omission in A’-dependencies should be considered as signaling a scope marking construction. Starting with object LD questions: I see no immediate objection against assuming that these can also involve scope marking. We know

from other languages that scope marking constructions are not confined to subject LD dependencies (although they may be more preferred there, cf. Den Dikken, 2018). At the same time, it is difficult to tell whether an object LD question without a complementizer is a scope marking construction or simply a standard LD question with the complementizer omitted. The poor inflection in English makes it difficult to observe anti-identity effects. The case assigned in the matrix clause and that in the embedded clause would be the same, so that there is no way to tell whether two separate cases have been assigned, or only one (that of the embedded clause). Furthermore, complementizer deletion is not confined to A'-dependencies, it also takes place in embedded clauses which do not involve A'-movement at all. However, a recent survey reported in Cowart & McDaniel (2021) shows that complementizer deletion leads to a significant drop in acceptability in object LD questions as well – just not as dramatic as with subject LD questions. In embedded declaratives without A' -movement, however, complementizer deletion does not lead to a significant drop in acceptability. This suggests complementizer deletion is more preferred in A'-dependencies in general. This could be explained by assuming that complementizer omission in non-subject questions involves scope marking as well.

Another question is whether scope marking is used in A'-dependencies other than wh-questions. In this paper, I have focused on wh-questions, however, the COMP-trace effect is not limited to wh-questions. Furthermore, in the previous paragraph, I presented data from LD subject relative clauses, which also appear to show anti-identity effects. This suggests that LD relatives may involve scope marking as well. I assume they would have a structure as in (13):

(13) That's the man [SM I think [VP t_{SM} V [CP *pro* saw me]]

The embedded CP would be a subject contact relative, which enters into an agreement relation with a scope marker. This construction would bear a lot of resemblance to the so-called resumptive prolepsis construction, discussed in detail in Salzman (2006; 2018). Salzman also draws parallels between resumptive prolepsis and (indirect dependency) scope marking: a major difference between resumptive prolepsis and scope marking is that resumptive prolepsis appears to involve binding, and therefore does not show sensitivity to locality. Obviously, the possibility of scope marking in relative clauses is something that would need to be worked out

in a lot more detail, more than I can do here. However, I do think the analysis I proposed here for subject LD wh-questions should be applicable to other types of LD constructions as well.

5.3 The absence vs. presence of case concord

I have argued that the English scope marking construction is related to the German (and Dutch) wh-copy construction. However, in German wh-copy constructions, the scope marker appears to copy not only the Φ -features but the case features of the lower wh-pronoun as well. For English, conversely, I have argued that this does not happen. In fact, English LD subject questions show anti-identity effects for case. This is a result which needs further explanation.

I believe it is not so much the English pattern that needs explanation: the anti-identity effects in terms of case are actually predicted by an indirect dependency approach. Therefore, it is the German pattern that must be explained. Could it be the case that in German the scope marker gets case-marked by the matrix little *v*, but that this case is somehow overwritten? If so, it could be seen as a type of inverse case attraction, in which the case of the higher wh-phrase is overwritten by the case of the lower wh-phrase. However, inverse case attraction is sensitive to the case hierarchy: nominative can overwrite accusative, but not the other way around (Czypionka et al., 2018). Therefore, I would like to propose that in wh-copy constructions in German, the scope marker does not get a case assigned in the matrix clause, assuming the matrix little *v* can, but must not obligatorily assign case. Not having its case assigned locally, the scope marker is able to take over the case of the lower wh-pronoun, with which it already stands in an Agree relation. In essence, I propose that there is a certain optionality in assigning case to the scope marker: technically, it can be done by either by the matrix little *v* or by copying over the case features of the lower wh-pronoun. I would like to suggest that the reason why German opts for the latter has to do with the fact that in German, case plays a much more prominent role in identifying the referent of a wh-pronoun than it does in English. Not only does German have much richer overt case morphology than English, case (in addition to agreement), also serves to disambiguate subject from object A'-dependencies (Bader & Meng, 2000). Assuming that case morphology guides comprehension much stronger in German than in English, endowing the scope marker with the case assigned to it in the matrix clause could lead to

potential comprehension problems. I assume that this is why in German, the case as well as the Φ -features are copied under agreement in wh-copy constructions.

5.4 Complex wh-phrases

In the analysis I have proposed here for English, I have focused on examples with pronominal wh-phrases. A relevant question is whether the analysis works the same with complex wh-phrases of the type “which NP”. As far as I know, subject LD questions with complex wh-phrases also (obligatorily) occur without complementizers, in other words they are subject to the COMP-trace effect as well. This would suggest that they involve scope marking as well. However, we would then have to assume that the scope marker is not a pronominal element but a full DP, or that the lower wh-phrase is actually a complex DP which copies all of its features over to the scope marker. Both are not very attractive options, and for this reason, Den Dikken (2018) proposes that copy constructions with complex wh-phrases must be analyzed differently, possibly as concealed clefts, along the lines of Koster (2009). The simplest hypothesis indeed seems to be that they are concealed clefts, the embedded clause being a subject contact relative:

(14) Which man do you think ~~it is~~ *pro* saw me?

After all, *it*-clefts are contexts in which subject contact relatives are frequently attested in contemporary varieties of English (see example 10a). The complex wh-phrase would be merged as the focus of the *it*-cleft, and the embedded contact relative clause could be interpreted as predicating over it. This is essentially the analysis that Adger & Ramchand (2005) also give for wh-questions in Scottish Gaelic.

6. Conclusions

In this paper, I have tried to solve various mysteries surrounding the formation of LD questions in English: firstly, the presumed absence of scope marking constructions in English, secondly, the obligatoriness of complementizer deletion in English subject LD questions (i.e. the COMP-

trace effect) and third, the occurrence of the oblique wh-phrase *whom* in English LD subject questions. I have argued that these phenomena are all related: English LD subject questions involve a type of scope marking construction, and complementizer omission (the COMP-trace effect) should be viewed as signaling the presence of a subject contact relative clause. Under an indirect dependency scope marking analysis, the highest wh-phrase is base-generated in matrix clause object position, explaining why it is able to receive oblique case and therefore to be spelled out as *whom*.

Endnotes

¹ Much of what is written in this paper is due to Jack Hoeksema, who, at some point during my undergraduate studies, handed me a paper on partial wh-movement. This led me down the rabbit hole of long-distance dependencies, a topic that I have been investigating ever since. Our mutual interest resulted in a PhD-thesis written under the supervision of Jack, and several joint papers. I thank Jack for the many years of fruitful collaboration, which has been nothing but a pleasure because of Jack's kind, humorous and generous personality, his encyclopaedic knowledge of linguistics and Dutch, and his continuous support and encouragement.

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³ I will return the issue of case-concord in section 4, since German is somewhat peculiar in also copying the case-features of the lower pronominal. As I will argue below, this does not seem to happen in English.

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