FUNCTIONAL ANSWERS AND STRUCTURAL ASYMMETRY IN FINNISH DITRANSITIVES*

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1. INTRODUCTION

In this paper, I use the availability of functional fragment answers as a diagnostic for structural (c-command) asymmetry in ditransitive structures in Finnish. In particular, I argue that this diagnostic provides further evidence for Kaiser's (2000; 2002) view that the direct object (DO) c-commands the indirect object (IO) in Finnish ditransitives, unless the IO undergoes scrambling. The core data consists of the pair shown in (1): in (1a), the functional fragment answer in B is fully acceptable with a bound reading of the possessive suffix (PX) on the IO, while in (1b), the bound reading of B is unavailable with PX on the DO.

(1) DO-IO asymmetry in functional fragment answers

a. A: [IO Kenelle] Mari$_j$ esitteli [DO joka vieraan$_i$]?
who-ALL Mari-NOM present-PAST.3SG every guest-ACC
'To whom did Mari present every guest?'
B: [IO Kaimalleen$_{i/j}$]
namesake-ALL.PX/3
'To her/his namesake'

b. A: [DO Kenet] Mari$_j$ esitteli [IO joka vieraalle$_i$]?
who-ACC Mari-NOM present-PAST.3SG every guest-ALL
'Whom did Mari present to every guest?'
B: [DO Kaimansa$_{*i/j}$]
namesake-ACC.PX/3
'Her/his namesake'

The logic of the diagnostic, which is not new, is based on binding (Morgan 1973): functional fragment answers always involve a bound variable. As the binding of at least some types of variables is standardly assumed to be dependent on c-command, the availability of functional fragment answers with a given type of variable indicates that the underlying form of the fragment answer constitutes an appropriate binding configuration for that variable. Some authors argue that this underlying form is hidden due to ellipsis (Morgan 1973; 1989; Hankamer 1979; Stanley 2000; Reich 2002; a.o.). Under the ellipsis approach, the relationship between the syntax and semantics of fragment answers is simple: fragment answers correspond to full sentences that have undergone ellipsis, and denote propositions, as do their non-elided counterparts. Other authors argue that the fragment answer is a linguistic unit in its own right, and does not have the syntax or semantics of a full sentence (Ginzburg & Sag 2000; Culicover & Jackendoff 2005; Stainton 2005; Ginzburg 2012; Jacobson 2016;

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a.o.). The availability of functional fragment answers specifically has been analysed as involving a binding-related well-formedness issue (a weak cross-over violation) within the *wh*-question addressed by the functional answer, and not the functional answer itself (Chierchia 1991; 1993). However, the Finnish data indicate that it is not sufficient to look at the syntax and semantics of the *wh*-question addressed by functional fragment answers in order to determine the conditions under which such answers are possible. This is because the *type* of the variable present in the functional fragment answer matters (see below). In this paper, I therefore adopt the ellipsis approach, and assume that the availability of a functional answer is a matter of usual conditions on variable binding within the functional answer itself. The proposal is specifically based on the assumption that functional fragment answers are derived via Ā-movement and ellipsis (Merchant 2001; 2004). I take a standard quantifier raising (QR) based approach to variable binding (Heim & Kratzer 1998), and assume that QR is subject to Richards's (1997) Shortest, as proposed in Bruening 2001.

Finnish is particularly suitable for the functional fragment answer diagnostic (and for teasing apart Merchant- and Chierchia-style approaches to functional fragment answers) because of the distinction it makes – in quantificational binding contexts – between bound variables that surface as a possessive suffix and require a local, c-commanding antecedent, and bound variables that surface as a pronoun-possessive suffix combination, and require a non-local *or* non-c-commanding antecedent. Although the possessive suffix can marginally find its non-quantificational antecedent in the context if no local c-commanding antecedent is available (Huhmarniemi & Brattico 2015), in quantificational binding, c-command is required. As a result, in Finnish, the surface form of the functional answer directly indicates whether a local c-commanding binder *must* or *cannot* be present at logical form (LF). Thus, the asymmetry in the availability of a functional fragment answer with a bare possessive suffix in (1) shows that the IO-fragment has a local quantificational antecedent (1a), while the DO-fragment does not (1b). This follows if after ellipsis resolution, only the IO-fragment is reconstructed into a position that is c-commanded by the DO, which in turn follows if the DO asymmetrically c-commands the IO (unless scrambling takes place). I argue that the differences between fragment answers with a bare possessive suffix and fragment answers with a pronoun-possessive suffix combination are indicative of the superiority of an ellipsis-based analysis of functional fragment answers in Finnish over Chierchia's question-based approach (1991; 1993).

This paper is structured as follows. Section 2 is a background section and discusses ditransitives (2.1.), variable binding (2.2.), and (functional) fragment answers (2.3.). Section 3 compares the subject vs. direct object (3.2.) and direct vs. indirect object (3.3.) questions with respect to the functional fragment answer diagnostic, and ends on a note on the applicability of the diagnostic to English ditransitives (3.4.). Section 4 concludes.

2. BACKGROUND

2.1. Structural asymmetry in ditransitives

Ditransitive verbs such as *give*, *send*, *introduce*, or *present* in English take two objects: a direct object (DO) and an indirect object (IO). While it is uncontroversial that subjects c-command objects, it is not so clear how the two objects of ditransitives are ordered. The picture is complicated by the existence of languages where different – and possibly derivationally unrelated – structures seem to exist for expressing ditransitivity.

In English, for example, double-object constructions (DOC) have been argued to be IO>DO (where ">" expresses c-command), while prepositional dative constructions (PDC) have been argued to be DO=IO (where "=" expresses mutual c-command) (Jackendoff 1990;

Marantz 1993; Bruening 2001, and references therein) or DO>IO[1] (Barss & Lasnik 1986; Aoun & Li 1989). Verbs that can appear in either structure are said to participate in *dative alternation*:

(2) Dative alternation in English
  a. DOC: I gave [$_{IO}$ a student] [$_{DO}$ a book]
  b. PDC: I gave [$_{DO}$ a book] [$_{IO}$ to a student]

In English, the two structures show a number of interpretive and structural differences. For example, in a DOC, the thematic role of the IO cannot be a *location* (endpoint of movement): while *I sent Mary to the hospital* is acceptable, *I sent the hospital Mary* sounds odd. In Marantz 1993 (see also Pylkkänen 2002), this difference is derived by assuming that the IO of a DOC is introduced by an applicative head with a specific thematic role (*possessor* or *recipient*), while the IO of a PDC receives its thematic role from a prepositional head P°. Rappaport-Hovav & Levin (2008) take a "verb-sensitive" approach, and argue that ditransitive verb roots differ in whether they may involve a caused possession event structure and a caused motion event structure, or merely the former. Verbs such as *give* only use a caused possession schema, whereas verbs like *throw* and *send* are also compatible with a caused motion schema. Crucially, only PDC allows for caused motion readings. Thus, regardless of verb class, the IO of a DOC will always be interpreted as the recipient of a caused possession event.[2]

Other differences pointing to a structural difference between DOCs and PDCs concern scope, anaphor binding, and variable binding (Barss & Lasnik 1986). The example in (3) illustrates scope freezing:

(3) Scope freezing in DOCs vs PDCs (Bruening 2001: 235)
  a. The teacher gave [$_{IO}$ a student] [$_{DO}$ every book] (DOC: ∃>∀, *∀>∃)
  b. The teacher gave [$_{DO}$ a book] [$_{IO}$ to every student] (PDC: ∃>∀, ∀>∃)

While the two quantificational phrases (QPs) of (3b) can be interpreted in either order, in (3a), only an interpretation in which the QPs are in the same order as in surface syntax is allowed. Bruening (2001) proposes that the asymmetry shown in (3) can be accounted for if we assume that (i) in DOCs but not in PDCs, the two objects are initially in an asymmetric configuration where the IO c-commands the DO, and (ii) QR obeys *Shortest* (Richards 1997). Essentially, Shortest is an economy constraint on the reordering of two XPs that both undergo movement triggered by the same head, or, in this case, quantifier raising (QR). Shortest ensures that if both objects of a ditransitive structure undergo QR, and they are initially in an asymmetric configuration, their initial structural relationship is replicated by the QR-landing

[1] As the anonymous reviewer points out, the fact that e.g. anaphors cannot be bound from the right in PDCs has been used as evidence for an underlying DO>IO order in PDCs (Barss and Lasnik 1986; Aoun and Li 1989):
(i) I showed Mary to herself in the mirror
(ii) * I showed herself to Mary in the mirror
However, (4b) shows that at least quantificational binding is possible from the right in PDCs (Bruening 2001).

[2] Rappaport-Hovav and Levin (2008) discuss a number of ways for distinguishing between caused-possession and caused-motion readings, one of them being the *where*-test:
(i) * Where did you *give* the book?
(ii) Where did you *throw*/*send* the book?
As *where* may only be interpreted as a location, and not as a recipient, questions with the caused-possession-only *give* cannot be formed using *where* (but *to whom*). I thank the anonymous reviewer for underlining the importance of verb-type in the analysis of ditransitivity.

positions (cf. (3a)). If the two objects are unordered in the relevant sense, then either order of movement is fine, and hence, either object may take scope over the other, as in (3b).

The conclusion that DOCs involve a structural asymmetry is also supported by variable binding data, if we assume that a QP may only bind variables that are in its c-command domain (Higginbotham 1980; Reinhart 1983; May 1985):

(4) Variable binding in DOCs (a) vs. PDCs (b) (Bruening 2001: 238)
   a. Mona sent [$_{IO}$ a professor who'd reviewed it$_{*i}$] [$_{DO}$ every book$_i$]
   b. Robert sent [$_{DO}$ a student who'd taken her$_i$ course] [$_{IO}$ to every professor$_i$]

In (4a), the DO may not bind the pronoun within the IO that precedes it, while in (4b), binding is possible from the IO to the DO in the same linear configuration. This follows if in DOCs, the IO and DO may never be reordered, while in PDCs, the IO is able to move to a position above the DO.

Instead of arguing for two different underlying structures, some authors have proposed that even in English the two ditransitive structures are derivationally related (Larson 1988). In a Larsonian PDC structure, the verb forms a constituent with the IO, and the DO is in a higher position; in DOCs, the IO moves to a position above the DO. In many languages, the availability of scrambling makes derivational accounts appealing. In these accounts, one order is base-generated, and the other is derived by scrambling. This type of approach has been proposed for e.g. Japanese (IO>DO is basic for Hoji 1985; Takano 1998), Turkish (DO>IO is basic for Kornfilt 2003; Issever 2003), German (DO>IO is basic for den Dikken 1995; Müller 1995; McGinnis 1999; Tungseth 2008), Romanian (DO>IO is basic for Cornilescu et al. 2017), and Finnish (DO>IO is basic for Kaiser 2000; 2002), although counterarguments have been presented for Japanese (both orders are base-generated for Miyagawa 1997), and Turkish and German (IO>DO is basic for Georgala 2011).

In Finnish, an SVO language with discourse-conditioned word order variation, the DO and IO of a ditransitive structure can be identified based on case-marking. As (5) shows, the DO is marked for (structural) accusative (ACC), and the IO for (non-structural) allative (ALL). The objects may appear in either linear order.

(5) Ditransitives and word order in Finnish

a.	Annoin	[$_{IO}$ oppilaalle]	[$_{DO}$ kirjan]
	give-PAST.1SG	student-SG.ALL	book-SG.ACC
	'I gave a/the student a/the book'		
b.	Annoin	[$_{DO}$ kirjan]	[$_{IO}$ oppilaalle]
	give-PAST.1SG	book-SG.ACC	student-SG.ALL
	'I gave a/the student a/the book'		

Based on data from anaphor binding, scope interactions, and information-structural word order effects, Kaiser (2000; 2002) proposes that Finnish ditransitive structures have an underlying DO>IO structure, and the IO>DO order is derived by scrambling a discourse-old IO over the DO. This conclusion is supported by acceptability judgments and corpus data.

Kaiser's anaphor binding data is shown in (6). What we are particularly interested in is the (relative) acceptability of (6c) and the unacceptability of (6d). Kaiser argues that the unacceptability of (6d) results from the absence of scrambling of the IO across the DO, and consequently, the absence of an appropriate binding configuration for the reciprocal (which is subject to Condition A; see section 2.2.1.). The acceptability of (6c), on the other hand, is due to the possibility of reconstructing the IO back below DO for binding purposes. Moreover, Kaiser's informants consider (6a) (and (6c)) to be slightly more marked than (6b), and not the other way around, which Kaiser takes to be evidence for the base-generation of DO>IO

instead of IO>DO. This conclusion is also supported by Kaiser's informant judgments, according to which the order in (6b) is preferred in an answer to *What happened?*, i.e. as the neutral way to answer a question allowing both objects to be discourse-new or -old (Prince 1992).

(6) Ditransitives and anaphor binding in Finnish (cf. Kaiser 2000, 2002)

a.	?	Esittelin	[$_{IO}$ oppilaille]	[$_{DO}$ toisensa]	[IO>DO$_{PX}$]
		introduce-PAST.1SG	student-PL.ALL	each other-ACC.PX/3	
		'I introduced the students each other'			
b.		Esittelin	[$_{DO}$ oppilaat]	[$_{IO}$ toisilleen]	[DO>IO$_{PX}$]
		introduce-PAST.1SG	student-PL.ACC	each other-ALL.PX/3	
		'I introduced the students to each other'			
c.	?	Esittelin	[$_{IO}$ toisilleen]	[$_{DO}$ oppilaat]	[IO$_{PX}$>DO]
		introduce-PAST.1SG	each other-ALL.PX/3	student-PL.ACC	
		'I introduced the students each other'			
d.	*	Esittelin	[$_{DO}$ toisensa]	[$_{IO}$ oppilaille]	[DO$_{PX}$>IO]
		introduce-PAST.1SG	each other-ACC.PX/3	student-PL.ALL	
		'I introduced the students to each other'			

The scope-freezing facts illustrated for English in (3) also show up in Finnish ditransitives, as shown below in (7). Therefore, while reconstruction is vital for the acceptability of (6c), reconstruction must be impossible for purposes of scope: otherwise, in the IO-DO order, the scope of an existential IO with respect to a universal DO would be expected to be reversible, contrary to what is attested – see (7a). Kaiser proposes that scope-freezing arises in Finnish due to a general ban on "undoing" the scopal effect of scrambling by subsequent QR-steps. This explanation differs from that proposed for English by Bruening (2001), but explains the facts nevertheless.

(7) Scope freezing in Finnish (cf. Kaiser 2000; 2002)

a.	Annoin	[$_{IO}$ jollekin oppilaalle]	[$_{DO}$ joka kirjan]	(∃>∀, *∀>∃)
	give-PAST.1SG	some student-ALL	every book-ACC	
	'I gave some student every book'			
b.	Annoin	[$_{DO}$ jonkun kirjan]	[$_{IO}$ joka oppilaalle]	(∃>∀, ∀>∃)
	give-PAST.1SG	some book-ACC	every student-ALL	
	'I gave some book to every student'			

In contrast to English, the thematic difference between different types of ditransitive verbs – i.e. whether their IO may be either a possessor/recipient or a locative goal, as with *send*- and *throw*-type verbs, or just a possessor/recipient, as with *give* (Rappaport-Hovav & Levin 2008) – is not immediately visible in Finnish. The *where*-test, for example, does not reliably distinguish *give*- verbs from the two other groups.[3] It is possible that in Finnish, *minne/mihin* 'where' may be used with both "normal" animate possessor-recipients, and "extended animates", such as institutions and organizations (cf. Rappaport-Hovav & Levin

[3] *Give*-type verbs, such as *antaa* 'give', *lahjoittaa* 'gift', *myydä* 'sell', and even *kertoa* 'tell', may appear in questions with *minne* or *mihin* '(to) where', as may *send/throw*-type verbs, such as *lähettää* 'send':

(i) *Minne/mihin voi antaa vanhan pianon?*
where can-3SG offer-INF old-ACC piano-ACC
'Where can one offer an old piano?'

(ii) *Minne/mihin voi lähettää vanhan pianon?*
where can-3SG send-INF old-ACC piano-ACC
'Where can one send an old piano?'

2008). Indeed, *kenelle* 'to whom' seems to imply a private person recipient, while *minne* and *mihin* do not. However, the thematic difference between Finnish ditransitive verbs becomes visible when we consider the 'successful transfer inference': *give*-verbs lexicalize caused possession only, and hence they always lead to the entailment that the possessor-recipient ends up in possession of the theme. *Send*- and *throw*-verbs, however, are also compatible with attempted but failed caused physical transfer to the possessor-goal. Unsurprisingly, *antaa* 'give' comes with an obligatory successful transfer inference, while *lähettää* 'send' does not. In sum, Finnish ditransitive verbs may also be divided into groups in terms of the internal event structure that the verb root meaning may encode.

A more general difference between English and Finnish that is relevant for this paper concerns variable binding. Before we discuss this difference, however, we will take a look at variable binding in general (section 2.2.1.), and specifically in Finnish (section 2.2.2.).

2.2. Variable binding

In the previous section, we saw that binding has been used as a tool in arguing for certain underlying structures for ditransitives. Moreover, as was mentioned in the introduction, functional fragment answers contain a pronominal and/or anaphoric element – a variable – that is bound semantically. Before we look at fragment answers, we will briefly discuss the technical assumptions we are making concerning variable binding, and the relevant properties of variable binding in Finnish.

2.2.1. *Variable binding in general*

By definition, variables are entities whose interpretation is assignment-dependent. Semantic binding by a variable binder, however, makes their interpretation assignment-independent, as shown in (8) (Heim & Kratzer 1998).

(8) Assignment-dependency vs. assignment-independency
   a. $[\![x_i \text{ laughs}]\!]^a$ denotes different truth values depending on the assignment *a*
   b. $[\![\lambda x.x \text{ laughs}]\!]^a$ denotes the same set independently of *a*

As illustrated by (8b), the standard assumption is that variables are bound by λ-abstractors. λ-abstractors appear due to the application of Predicate Abstraction (PA), which is a prerequisite for QR. QR is therefore in turn a prerequisite for variable binding in the semantic sense (see e.g. Heim and Kratzer 1998). PA introduces a λ-binder which replaces *co-indexed* traces/pronouns with a variable *x* bound by the λ. The index $i \in \mathbb{N}$ on the trace/pronoun identifies which variable is bound. By (a standard) assumption, a given λ-binder may only bind variables in its c-command domain.

Following Bruening (2001), I assume that when two phrases QP1 and QP2, of which the former c-commands the latter, undergo QR, they do so in an order that replicates their relative positions at their landing sites (QP1 c-commands QP2). This assumption is based on Richard's (1997) Shortest, itself a combination of Chomsky's (1995) Attract Closest (or an equivalent locality principle) and Shortest Move (or an equivalent economy principle). The workings of Shortest are familiar from multiple-*wh* movement in languages such as Bulgarian, where the hierarchically highest *wh*-phrase first moves to Spec,CP, and then other lower *wh*-phrases "tuck in" under it (Rudin 1988):

(9) Multiple *wh*-movement in Bulgarian (Richards 1997)

a.	[$_{CP}$ Koj$_1$	[$_{CP}$ kude$_2$	[C° [t_1	udari	Ivan	t_2]...]
	who	where		hit	Ivan		
b. *	[$_{CP}$ Kude$_2$	[$_{CP}$ koj$_1$	[C° [t_1	udari	Ivan	t_2]...]
	where	who		hit	Ivan		

While type-theoretic reasons force objects to QR (or else to undergo a type-shifting operation), subjects may be interpreted without QR in Spec,IP/Spec,*v*P. However, when a subject is to bind a variable inside e.g. an object, the subject is also forced to QR: otherwise, it does not introduce a variable binder. This is illustrated in (10).

(10) Multiple QR and variable binding

Surface syntax:	Every girl$_1$ loves her$_1$ mother
LF:	[Every girl [1 [her$_1$ mother [2 [t_1 loves t_2]...]
... and not:	[her$_{*1}$ mother [2 [every girl$_1$ loves t_2]]]

Heim & Kratzer (1998) introduce the notion of *derivative semantic binding* in order to help elucidate the syntax-semantics interaction in binding. Derivative semantic binding holds between two expressions α and β iff the trace of α (α being the QP that undergoes QR) and β (the variable) are both bound by the same variable binder. Based on this notion (itself based on the definition of semantic binding), they spell out the following Binding Principle:

(11) Binding Principle (Heim & Kratzer 1998)
Let α and β be DPs, where β is not phonetically empty. Then α binds β *syntactically* iff α binds β *semantically* (in the derivative sense)

The authors write:

> "The Binding Principle imposes a direct correspondence between syntactic binding at SS [surface structure, K.L.] and variable binding at LF. Whenever you find syntactic binding of a pronoun at SS, you have a bound variable interpretation at LF. And whenever you have a bound variable interpretation at LF, you have syntactic binding at SS." (Heim & Kratzer 1998: 264)

Thus far, however, we have not said anything about when syntactic binding holds. In the following definition (cf. Chomsky 1981), note especially the c-command condition (ii):

(12) Syntactic binding (Heim & Kratzer 1998: 272)
α *syntactically* binds β iff
(i) α and β are co-indexed
(ii) α c-commands β
(iii) α is in an A-position
(iv) α does not c-command any γ such that γ is co-indexed with β, γ c-commands β, and γ is in an A-position

In (13), I list the cornerstone conditions of Binding Theory (Chomsky 1981).

(13) Binding conditions
(i) Condition A: Anaphors must be bound locally
(ii) Condition B: Pronouns must be bound non-locally

(iii) Condition C: R-expressions must be free

Now, based on the Binding Principle (11) and the semantic and syntactic definitions of binding, it should be the case that whenever we have a bound reading of an anaphor (subject to Condition A) or a pronoun (subject to Condition B), that anaphor or pronoun must be c-commanded by its binder (locally or non-locally) (13). Otherwise, the requirements of syntactic binding are not met. And if they are not met, then the Binding Principle dictates that the variable corresponding to the anaphor or pronoun cannot be semantically bound, either.

There are counterexamples to the Binding Principle, however. We will see many examples that involve the Finnish pronoun+PX combination below. Barker (2012) proposes that the c-command requirement that is so central to standard accounts of both syntactic and semantic binding is misguided, given that e.g. quantifiers embedded inside possessive DPs may bind variables that are not in their c-command domain (see example (21) from Finnish below). However, Déchaine & Wiltschko (2014) note that in all of Barker's examples, the syntactic entities that correspond to a bound variable in the semantics may be replaced with epithets, which are subject to Condition C, and could be bound by a different mechanism than the QR-based mechanism introduced above. In Baltin, Déchaine & Wiltschko (2015), this different mechanism is assumed to operate after LF, in a discourse representation component. In the next section, we will see that the same holds at least for the binding of the Finnish pronoun+possessive suffix combination (and marginally of non-quantificational binding of possessive suffixes). In sum, then, both the syntactic and the semantic relationship between the binder and the bindee matter for the acceptability of a bound reading, but a biconditional such as the one encoded in the Binding Principle is too strong.

Finally, note that syntactic binding is dependent on A-positions, and hence, in Ā-movement contexts, binding is determined by the launch position of Ā-movement:

(14) Ā-movement and variable binding
   a. Baseline: Its$_{*i/j}$ owner loves [every dog]$_i$
   b. Topicalization: Its$_{i/j}$ owner, [every dog]$_i$ loves t
   c. Wh-movement: Which of her/his$_i$ dogs does [every dog owner]$_i$ love t?

As (14b) shows, a topicalized pronoun-containing object may be semantically bound (in the derivative sense) by a quantifier phrase that is c-commanded by it in surface syntax (assuming that topicalization targets CP). The same remark applies to *wh*-movement. This point is important for fragment answers under the assumption that they involve Ā-movement as well, as we will argue in section 2.3. based on Merchant's work (2001; 2004).

2.2.2. *Variable binding in Finnish*

In Finnish, functional answers are fragment answers that contain a bound variable surfacing either as a bare possessive suffix (PX) marked for person and number, or a pronoun+PX combination. In general, the PX appears on nouns, certain non-finite verb forms and participles, and prepositions. The following example shows the forms PX takes when it essentially appears as a doubler of the possessive pronoun. In 3rd person, the number distinction is neutralized, and depending on the case of the noun, the ending may be realized as *–nsA* or *–Vn.* No PX is used with the non-human possessors (*sen* 3SG, *niiden* 3PL), but PX does appear on e.g. infinitivals even in the absence of a human antecedent (Toivonen 2000; Huhmarniemi & Brattico 2015).

(15) The possessive paradigm of PX

a. minun kirja-ni
I-GEN book-NOM.PX/1SG
'my book'

b. sinun kirja-si
you-GEN book-NOM.PX/2SG
'your book'

c. hänen kirja-nsa / kirjalle-en
(s)he-GEN book-NOM.PX/3 book-ALL.PX/3
'her/his book' / 'on/to her/his book'

d. meidän kirja-mme
we-GEN book-NOM.PX/1PL
'our book'

e. teidän kirja-nne
you-GEN book-NOM.PX/2PL
'your book'

f. heidän kirja-nsa / kirjalle-en
they-GEN book-NOM.PX/3 book-ALL.PX/3
'their book' / 'on/to their book'

In terms of binding, a 3rd person bare PX behaves like an anaphor, while the pronoun+PX combination behaves like English possessive pronouns: the bare PX requires a local, c-commanding antecedent (by Condition A), as shown by the comparison of (16a) and (16b), while the pronoun+PX requires a non-local (by Condition B) *or* a local but non-c-commanding antecedent (by Condition C), as shown by the comparison of (16c) and (16d).

(16) Conditions A, B, C: PX vs. pronoun+PX
[Mari]$_i$ uskoo että
Mari-NOM believe-PRES.3SG that
'Mari$_i$ believes that...'

a. [Minna]$_j$ voittaa [eränsä]$_{*i/j}$
Minna.NOM win-PRES.3SG round-ACC.PX/3
'... Minna$_i$ will win her$_i$ round'

b. [Minnan$_j$ sisko]$_k$ voittaa [eränsä]$_{*i/*j/k}$
Minna.GEN sister- NOM win-PRES.3SG round-ACC.PX/3
'... Minna's sister$_i$ will win her$_i$ round'

c. [Minna]$_j$ voittaa [hänen eränsä]$_{i/*j}$
'Minna-NOM win-PRES.3SG her-GEN round-ACC.PX/3
'... Minna will win her$_i$ round'

d. [Minnan$_j$ sisko]$_k$ voittaa [hänen eränsä]$_{i/j/*k}$
'Minna-GEN sister- NOM win-PRES.3SG her-GEN round-ACC.PX/3
'... Minna's sister will win her$_i$ round'

In 1st and 2nd person, the PX can also be bound by a contextual antecedent, while the same is generally not possible for the 3rd person PX.[4] This is shown in (17): the 3rd person bare PX in (17a) cannot appear without a local c-commanding antecedent, whereas the 1st person bare PX in (17b) can. In the latter case, the PX refers to the speaker.

[4] See Huhmarniemi & Brattico (2015) for examples of contextually bound 3rd person bare possessive suffixes.

(17) Contextual antecedent: 1st/2nd vs. 3rd person possessive suffix
a. *? [Minä]$_i$ korjasin [pyöränsä]$_{*i/*?j}$
Mari-NOM fix-PAST.3SG bike-ACC.PX/3
Intended: 'I fixed her/his bike'
b. [Mari]$_i$ korjasi [pyöräni]$_{*i/j}$
Mari-NOM fix-PAST.3SG bike-ACC.PX/1SG
'Mari fixed my bike'

Given these data, one line of analysis has proposed that the 3rd person PX is an anaphor, while the 1st and 2nd person suffixes are either anaphors bound by local discourse-binders (Vainikka 1989) or pronouns (Trosterud 1993). Another line of work takes PX to be an agreement marker of a little *pro* (van Steenbergen 1991; Huhmarniemi & Brattico 2015). This analysis, illustrated below in (18), has the advantage of linking usual *pro*-drop conditions in Finnish to the possibility of having contextual antecedents for PX.

(18) Huhmarniemi & Brattico 2015: 8
Pekka korjasi [$_{DP}$ *pro*$_i$ pyörä-*nsä*]
Pekka-NOM fix-PAST.3SG bike-ACC.PX/3
'Pekka fixed his bike'

In (18), *pro* appears in Spec,DP (or NP). Huhmarniemi & Brattico (2015) argue that given that it is marginally possible for a 3rd person PX to be contextually bound, the *pro* in (18) must have both pronominal and anaphoric properties: it is anaphoric in that it mostly requires a local c-commanding antecedent, but, as a last resort, it may look for a contextual antecedent that matches the feature specification of the PX. Huhmarniemi & Brattico assume that the licensing conditions of *pro* as a pro-drop-subject and *pro* in Spec,DP are the same. However, the authors do not notice that while both *pro*s strongly prefer a c-commanding antecedent, the *pro* of the PX-structure also strongly prefers a *local* c-commanding antecedent, while a subject *pro* is quite content with a non-local (c-commanding) antecedent. This point is made in (19).

(19) Locality: bare *pro* vs. *pro* of the PX-structure
[Mari]$_i$ uskoo että
Mari-NOM believe-PRES.3SG that
a. *pro*$_{i/*j}$ voittaa kilpailun
win-PRES.3SG race-ACC
'Mari$_i$ believes she$_i$ will win the race'
b. hän$_{i/j}$ voittaa kilpailun
(s)he-NOM win-PRES.3SG race-PAR
'Mari$_i$ believes she$_{i/j}$ will win the race'
c. ? [*pro* siskonsa]$_{?i/?j}$ voittaa kilpailun
sister-NOM.PX/3 win-PRES.3SG race-ACC
Intended: 'Mari$_i$ believes her/his$_{i/j}$ sister will win the race'
d. [hänen siskonsa]$_{i/j}$ voittaa kilpailun
sister-NOM.PX/3 win-PRES.3SG race-ACC
'Mari$_i$ believes her/his$_{i/j}$ sister will win the race'

One could argue that the relatively degraded acceptability of (19c) comes from the competition between (19c) and (19d), of which the latter contains an overt pronoun. However, this would leave unexplained why *pro* is preferred in (19a), although the overt pronoun is again acceptable with a co-referring reading, as shown by (19b). Moreover, it should be noted

that while the subject *pro* does not readily accept a discourse-antecedent *j*, the *pro* of the PX-structure does sometimes accept such an antecedent when it does not have a local, c-commanding antecedent. Therefore, the *pro* involved in *pro*-drop and the *pro* suggested to be involved in PX-structures have some differing properties.

Regardless of whether bare PX-structures involve a *pro* or not, quantificational variable binding is possible with both bare PX and pronoun+PX, and the conditions almost fully mirror those we see in (16) and (19): a bound PX must have a local, c-commanding antecedent, whereas pronoun+PX is content with either a non-local *or* a local non-c-commanding antecedent. Let us now look at the locality and c-command conditions one after the other.

First, if a bound variable reading is to obtain, and a bare PX is used, we see a Condition A effect, as shown in (20c): (20a) only allows for a reading where the local quantifier phrase *joka tyttö* binds the PX, and the same reading is missing in (20c) in the absence of a local quantifier antecedent. In contrast, (20b) shows a Condition B effect, as the pronoun+PX combination cannot be interpreted as bound by the local c-commanding quantifier, and we only get a bound reading when that quantifier is non-local, as it is in (20d), where the quantifier sits in the higher clause.

(20) Conditions A and B with variable binding: PX vs. pronoun+PX

[Mari]$_i$ uskoo että
Mari-NOM believe-PRES.3SG that

a. [joka tyttö]$_j$ voittaa [eränsä]$_{*i/j}$
every girl.NOM win-PRES.3SG round-ACC.PX/3
'Mari believes that every girl$_i$ will win her$_i$ round'

b. [joka tyttö]$_j$ voittaa [hänen eränsä]$_{i/*j}$
every girl-NOM win-PRES.3SG her-GEN round-ACC.PX/3
'Mari$_i$ believes that every girl will win her$_i$ round'
[Joka tyttö]$_i$ uskoo että
every girl-NOM believe-PRES.3SG that

c. [Mari]$_j$ voittaa [eränsä]$_{*i/j}$
Mari-NOM win-PRES.3SG round-ACC.PX/3
'Every girl believes that Mari$_i$ will win her$_i$ round'

d. [Mari]$_j$ voittaa [hänen eränsä]$_{i/*j}$
Mari-NOM win-PRES.3SG her-GEN round-ACC.PX/3
'Every girl$_i$ believes that Mari will win her$_i$ round'

As mentioned above, Huhmarniemi & Brattico (2015) provide examples showing that in non-quantificational contexts, non-c-commanding antecedents for a bare PX are sometimes acceptable. However, in a number of non-c-command configurations (cf. Barker 2012), quantificational binding of a bare PX is impossible if a local, c-commanding antecedent is unavailable, as illustrated in (21a). Quantificational binding of pronoun+PX is possible in this configuration, as the parallel example in (21b) shows.

(21) C-command requirement for variable binding: PX vs. pronoun+PX

a. [Joka oppilaan$_i$ isä]$_j$ muistaa [ensimmäisen koulupäivänsä]$_{*i/j}$
every student-GEN father-NOM remember-PRES.3SG first-ACC school day-ACC.PX/3
Intended: 'Every student$_i$'s father remembers his/her$_i$ first school day'

b. [Joka oppilaan$_i$ isä]$_j$ muistaa [hänen
every student-GEN father-NOM remember-PRES.3SG her/his-GEN
ensimmäisen koulupäivänsä]$_{i/*j}$
first-ACC school day-ACC.PX/3
'Every student$_i$'s parents remember his/her$_i$ first school day'

Let us now come back to variable binding in ditransitive structures. At the end of the previous section, I alluded to a difference between English and Finnish ditransitives when it comes to variable binding. Example (4) shows that in English, leftward variable binding is impossible in a DOC (4a), but possible in a PDC (4b). Kaiser (2000; 2002) only discusses reciprocal binding in Finnish, noting that variable binding seems to be constrained by linear precedence in a way that anaphor binding is not. Indeed, the Finnish versions of (4) in (22) reveal that in neither of the two possible orders may a bare PX contained within the first object be bound by a linearly following second object (22b, 22d). However, a pronoun+PX combination may be marginally bound in such a configuration, as shown in (22a) and (22c). The contrast between (22a,c) and (22b,d) is clear, while the contrast between (22a) and (22c) is more subtle. However, all of these examples are marked, possibly due to the heaviness of the first object (be it a DO or an IO). Based on the binding requirements presented above, the unacceptability of (22b) and (22d) follows simply from the fact that the PX is too embedded (it is inside a relative clause), and thus does not have the local antecedent it requires.

The (marked) acceptability of a bound reading in (22a) and (22c), and the contrast between the two, however, seems to mean that for some reason, raising the IO over the DO (22c) via QR is "easier" than reconstructing the IO under the DO (22a). The fact that the reciprocal-containing IO reconstructs swiftly under the DO in (6c) could then indicate that the "easiness" of reconstruction is somehow sensitive to the nature of the bound variable in Finnish (PX or pronoun+PX). In other words, as a reciprocal requires a local c-commanding antecedent – not incidentally, the morphological make-up of Finnish reciprocals contains a PX – while the pronoun+PX requires a non-local or non-c-commanding antecedent, it seems that the reconstruction of an IO with the latter type of variable is hard. I leave this question open.

(22) Variable binding in Finnish: pronoun+PX (a,c) vs PX (b,d) (cf. (4))

a. ? Mona$_k$ lähetti [$_{IO}$ opettajalle$_j$ joka tunsi
Mona-NOM send-PAST.3SG teacher-ALL who-NOM know-PAST.3SG
hänen menneisyytensä$_{?i/*j/k}$] [$_{DO}$ joka oppilaan$_i$]
her/his-GEN past-ACC.PX/3 every student-ACC
'Mona sent to the teacher who was aware of his/her$_i$ past every student$_i$'

b. ? Mona$_k$ lähetti [$_{IO}$ opettajalle$_j$ joka tunsi
Mona-NOM send-PAST.3SG teacher-ALL who-NOM know-PAST.3SG
menneisyytensä$_{*i/j/*k}$] [$_{DO}$ joka oppilaan$_i$]
past-ACC.PX/3 every student-ACC
Intended: 'Mona sent to the teacher who was aware of his/her$_i$ past every student$_i$'

c. ? Mona$_k$ lähetti [$_{DO}$ oppilaan$_j$ joka tunsi
Mona-NOM send-PAST.3SG student-ACC who-NOM know-PAST.3SG
hänen menneisyytensä$_{i/*j/k}$] [$_{IO}$ joka opettajalle$_i$]
his/her-GEN past-ACC.PX/3 every teacher-ALL
'Mona sent a student who had was aware of his/her$_i$ past to every teacher$_i$'

d. ? Mona$_k$ lähetti [$_{DO}$ oppilaan$_j$ joka tunsi
Mona-NOM send-PAST.3SG student-ACC who-NOM know-PAST.3SG
menneisyytensä$_{*i/j/*k}$] [$_{IO}$ joka opettajalle$_i$]
past-ACC.PX/3 every teacher-ALL
Intended: 'Mona sent a student who was aware of his/her$_i$ past to every teacher$_i$'

In sum, in this section, we have established that the two types of bound variables that may appear in functional fragment answers in Finnish – the bare PX, and the pronoun+PX combination – are subject to different binding conditions. While a bound bare PX must have a local, c-commanding antecedent, the pronoun+PX combination is content with either a non-local *or* a non-c-commanding antecedent.

2.3. The syntax and semantics of (functional) fragment answers

Functional answers are fragment answers that typically address a *wh*-question with a universal quantifier, and contain a bound variable. They are notorious for showing a clear structural sensitivity effect (e.g. Chierchia 1991; 1993): for example, functional answers are acceptable as answers to *wh*-questions with a subject-position universal quantifier and an object-position *wh*-phrase, but not to *wh*-questions with an object-position universal quantifier and a subject-position *wh*-phrase, as shown in (23).

(23) The availability of functional answers is structurally conditioned
  a. A: [$_{DO}$ Who] does [$_{SUBJ}$ every dog owner$_i$] love t ?
     B: [$_{DO}$ Her$_i$ dog]
  b. A: [$_{SUBJ}$ Who] t loves [$_{DO}$ every dog owner$_i$]?
     B: [$_{SUBJ}$ Her$_{*i}$ dog]

Chierchia (1991; 1993) proposes that the asymmetry shown in (23) arises because functional answers address *wh*-questions where *wh*-movement has left behind a complex functional trace (see also Engdahl 1986; Dayal 1996). This trace has two indexes: an *identity* index *i* that identifies the trace with the moved *wh*-phrase, and an *argument* index *a* that is an individual variable in need of binding by a c-commanding argument. The *a*-index can be thought to correspond to the possessive pronoun of the functional answer. The problem with the configuration in (23b) is that in order for the *a*-index of the trace to be bound, the DO must move to a position from where it c-commands the trace. Given the pronominal nature of the *a*-index, however, this movement would result in a weak cross-over (WCO) violation, and hence, the question cannot be interpreted with a functional *wh*-trace. In (23a), the subject quantifier phrase is able to bind the *a*-index of the complex trace without any trouble, and a functional reading of the question can be derived, as shown by the availability of a functional answer. This configuration is shown in (24). Following a notational practice of Chierchia, the *i*-index is subscripted, and the *a*-index is superscripted.

(24) Binding the *a*-index of a functional *wh*-trace and WCO (Chierchia 1991, 1993)
  a. [wh_i … [binder^a … [… t_i^a …]]]
  b. * [wh_i … [binder$_j^a$ … [… t_i^a ... t_j^a …]]]

Chierchia's approach derives the distribution of functional fragment answers based on the syntax and semantics of the question, and does not assume ellipsis in the fragment answer (see also Jacobson 2016 for arguments against the use of binding data as evidence for the ellipsis approach). In contrast, Merchant (2004) proposes that fragment answers in general are derived through (i) Ā-movement and (ii) ellipsis (see also Merchant 2001). Under the ellipsis approach, it is assumed that the non-sentential fragment is fully propositional at LF, and the surface "deletion" of anything but the fragment is the result of a phonological operation that applies after PF. I will now introduce Merchant's approach in more detail.

Merchant (2004) proposes that fragment answers are very much like *sluices* (Ross 1969). He proposes to analyse sluicing as *wh*-movement out of IP to CP, and subsequent

deletion (in the sense of non-pronunciation) of the IP (Merchant 2001). In (25), ellipsis is signalled with a triangle.

(25) Fragment answers (a) vs. sluicing (b)
  a. *Who laughed?* – *Mary* △.
  b. Somebody laughed, but I don't know *who* △.

Both sluices and fragments show connectivity effects which can be explained if the full sentential structure is there, but is simply not pronounced. For example, sluices and fragments retain the same case-marking that their counterparts in full structures bear: this is evident in any of the Finnish fragment answer examples above, and is also visible in Finnish sluices.

(26) Case connectivity in Finnish sluices
  a. Kutsuin jonkun, mutta en muista kenet △
  invited-PAST.1SG someone-ACC but NEG-1SG remember-CONN who-ACC
  'I invited someone, but I don't remember who'
  b. Kutsuin jonkun, mutta en muista kenet kutsuin

In Merchant's analysis (2001; 2004), ellipsis is syntactically licensed by a head with an E-feature. The E-feature itself has certain features which impose constraints on which head the E-feature may co-occur with. In sluicing, Merchant argues, E bears uninterpretable instances of the *wh* and *Q* features, and hence it must co-occur with a C that bears interpretable instances of these same features, allowing for the deletion of the uninterpretable instances through Agree. This is shown in (27). To account for the Ā-movement step, Merchant proposes that either the features of E are strong in the Minimalist sense (marked with a star), or E has the EPP-property, forcing Spec,H+E to be filled. Angled brackets signal PF-deletion.

(27) The syntax of sluicing (Merchant 2004: 670)
  a. E_s has features [*u*wh*, *u*Q*]
  b. [$_{CP}$ wh-phrase$_{[wh]}$ [$_{C'}$ C$_{[wh,Q]}$+E$_{[\sout{uwh}*,\sout{uQ}*]}$ [<IP … t_{wh}>]]]

For fragment answers, Merchant proposes that E co-occurs with F° (a focus head), as in (28).

(28) The syntax of fragment answers (Merchant 2004: 675)
  a. E_f has feature [*u*F]
  b. [$_{FP}$ fragment$_{[F]}$ [$_{F'}$ F$_{[F]}$+E$_{[\sout{uF}*]}$ [<IP … $t_{fragment}$>]]]

In both sluices and fragment answers, the phonology of E instructs the phonological component not to pronounce the complement of E. The semantics of E constrain its presence in a structure via a presupposition: E is fed a proposition *p* which it returns, but the function is defined just in case an appropriate semantic antecedent for *p* is available. In other words, E says that an E-given *p* may be unpronounced. The requirement for a suitable antecedent is modelled using the notion of *e-givenness* (Merchant 2001; Tomioka 2003):

(29) E-givenness and the semantics of E (Merchant 2012: 25, 2004: 672)
  a. ⟦E⟧ = λp: e-GIVEN(p) . p
  b. An expression *X* is *e-given* iff *X* has a salient antecedent *A* and, modulo existential type-shifting,

(i) *A* entails E-clo(*X*), and
(ii) *X* entails E-clo(*A*),
where the E-closure of an expression *Y* is the result of replacing all the F-marked subelements of *Y* with variables of the appropriate type and binding them existentially, or simply existentially binding the variables already present in *Y*.

Assume for simplicity that *wh*-movement leaves behind a trace that semantically corresponds to a variable, and that the Ā-movement undergone by the fragment leaves behind an F-marked trace or copy. In a very basic form, what (29) requires is that the E-closure of the IP of the elided part of the fragment answer is identical to the E-closure of the IP of the question, as shown in (30) below.

(30) E-givenness in fragment answers
a. $[_{CP}$ Who C° $[_{IP1}$ t_{who} laughed]] $\Rightarrow$ E-clo(IP1) = $\exists x.x$ laughed
b. $[_{FP}$ Mary F°+E $[_{IP2}$ t_{Mary} laughed]] $\Rightarrow$ E-clo(IP2) = $\exists x.x$ laughed
c. E-clo(IP1) $\Rightarrow$ E-clo(IP2); E-clo(IP2) $\Rightarrow$ E-clo(IP1)

Now, the last thing we need to figure out is how exactly the binding of a variable within the fragment XP can be achieved. Under the approach we are adopting, the fragment undergoes Ā-movement to Spec,FP. In (14), we noted that Ā-moved phrases reconstruct for binding purposes. Therefore, we will assume that the binding conditions in functional fragment answers are determined by the position to which the fragment reconstructs within the elided IP, and by the type of variable the fragment contains. In Finnish, this leads to different predictions in cases where the fragment answer contains a bare PX and cases where the variable is a pronoun+PX combination. We now turn to the functional fragment answer data.

3. FUNCTIONAL FRAGMENT ANSWERS AS A DIAGNOSTIC FOR STRUCTURAL ASYMMETRY

3.1. Taking stock

Let us take stock: a quantifier phrase α is only able to semantically bind (in the derivative sense) a variable β if both β and the trace of α are semantically bound by the λ-abstractor that the QR of α introduces (section 2.2.1.). However, semantic binding is sometimes possible in the absence of syntactic binding, and specifically, in the absence of c-command. Crucially, we showed that in Finnish, a bare PX may only be quantificationally bound by a local c-commanding α, while the pronoun+PX combination requires either a non-local or a non-c-commanding α (section 2.2.2.). Moreover, as we are dealing with fragment answers, whose syntax is assumed to involve Ā-movement, recall that the position relevant for determining if c-command holds is the launching position of Ā-movement (section 2.3.). As functional fragment answers involve variable binding, which in turn is dependent on QR, it is also important to repeat here our assumption that QR is subject to Shortest (Bruening 2001). Although space did not permit a consideration of the evidence put forth in Bruening 2001, I will assume that when two QPs such that QP1>QP2 both undergo QR, they land in positions that replicate their original structural positions (QP1>QP2).

Our assumptions lead us to expect that whenever the Ā-moved fragment containing a variable β is initially in a position that is *below* the quantifier phrase α, or more specifically, c-commanded by α, it is possible for β to be bound by α. This is because by Shortest, the QPs do not reorder when they QR: if α c-commands the phrase containing β before QR, it also c-commands it after QR, and hence, the variable can be bound. In contrast, when the β-

containing fragment is initially in a position that is *above* α, or more specifically, that c-commands α, we run into trouble. If QR cannot reorder the two QPs, the phrase containing β will stay above α after QR, the λ-binder introduced by the QR-step of α will not c-command β, and β cannot be bound by it.

The above predictions hold only for bare PX in Finnish: as it was shown in section 2, the pronoun+PX combination specifically repels local c-commanding antecedents. Therefore, whenever a functional fragment answer with a bare PX is acceptable, the bare PX must have a local c-commanding antecedent; hence, the corresponding functional fragment answer with pronoun+PX is predicted to be *un*acceptable. As for the reverse case, the prediction is less clear: when a bare PX is unacceptable, we know that it lacks a local c-commanding antecedent. In this case, the binding of pronoun+PX could in principle be possible. A potential restriction on this type of binding would be a restriction on cataphors in general.

Before we look at our target data involving direct and indirect objects in section 3.3., let us first establish the baseline subject vs. direct object contrast in fragment answers.

3.2. Baseline: subjects vs. direct objects

The structural sensitivity of functional answers was initially illustrated with examples involving subjects and direct objects, as in (31) (Chierchia 1991; 1993).

(31) Functional answers in English: SUBJ vs. DO (=(23))
- a. A: [$_{DO}$ What] does [$_{SUBJ}$ every dog owner$_i$] love t ?
  B: [$_{DO}$ Her/his$_{i/j}$ dog]
- b. A: [$_{SUBJ}$ Who] t loves [$_{DO}$ every dog owner$_i$]?
  B: [$_{SUBJ}$ Her/his$_{*i/j}$ dog]

The same contrast also holds in Finnish, as shown below in (32).

(32) Functional answers in Finnish: SUBJ vs. DO, bare PX
- a. A: [$_{DO}$ Mitä] [$_{SUBJ}$ joka koiranomistaja$_i$] rakastaa t ?
  what-PAR every dog owner-NOM love-PRES.3SG
  B: [$_{DO}$ Koiraansa$_{i/*j}$]
  dog-PAR.PX/3
- b. A: [$_{SUBJ}$ Kuka] t rakastaa [$_{DO}$ joka koiranomistajaa$_i$]?
  who-NOM love-PRES.3SG every dog owner-PAR
  B: [$_{SUBJ}$ Koiransa$_{*i/?j}$]
  dog-NOM.PX/3

In (32), the functional answers contain a PX that can be interpreted as semantically bound by the quantifier *joka koiranomistaja* ‘every dog owner’ in (32a), but not in (32b). If the functional answer contains a pronoun+PX combination instead, as in (33), the bound reading is unavailable in the (a) configuration, and marginally possible in the (b) configuration.

(33) Functional answers in Finnish: SUBJ vs. DO, pronoun+PX
- a. A: [$_{DO}$ Mitä] [$_{SUBJ}$ joka koiranomistaja$_i$] rakastaa t ?
  what-PAR every dog owner-NOM love-PRES.3SG
  B: [$_{DO}$ Hänen koiraansa$_{*i/j}$]
  her/his-GEN dog-PAR.PX/3

b. A: [SUBJ Kuka] t rakastaa [DO joka koiranomistajaa$_i$]?
who-NOM love-PRES.3SG every dog owner-PAR
B: [SUBJ Hänen koiransa$_{?i/j}$]
her/his-GEN dog-NOM.PX/3

Recall that pronoun+PX combinations can only receive a quantificationally bound interpretation if the antecedent is non-c-commanding or non-local, and that the bare PX requires a local, c-commanding antecedent. The data in (32) and (33) indicate that when the fragment corresponds to a DO, a PX contained within it may be bound quantificationally (32a), but a pronoun+PX combination may not (33a); moreover, when the fragment corresponds to the subject (32b), the bare PX within it cannot be bound, and hence there it must not be able to find a local, c-commanding antecedent, while in (33b), a bound reading is marginally available, which means that the subject must not be c-commanded by the DO. This follows from the assumption that subjects c-command DOs.

Now, as was mentioned in section 2, subjects are not required to QR for type-theoretic reasons, but they must QR whenever they are to bind a variable. This is the case in (32a). The LF in (34b) shows that under the standard assumption that subjects c-command DOs, and our assumption that QR obeys Shortest, the acceptability of the bound reading of the PX-answer in (32a) is accounted for: the subject QRs to a position higher than the DO, and the binder thus introduced is able to bind the PX.

(34) Functional answer to *wh*$_{DO}$-$\forall_{SUBJ}$ question: PX (cf. (32a))
a. The question: [DO Mitä] [SUBJ joka koiranomistaja$_i$] rakastaa t?
Surface syntax: [CP What [C° [IP every dog owner love t]]]
LF: [CP What [1 [C° [IP every dog owner love t]...]
b. The answer: [DO Koiraansa$_i$]
Surface syntax: [FP Her(/his) dog [F°+E [IP <every dog owner love t>]]]
LF: [IP every dog owner [2 [IP <u>her</u>$_2$ dog [1 [IP t$_2$ love t$_1$]...]

In (32b), where the DO should bind the variable within the subject, a functional reading of PX is unavailable. Here, the subject is not required to QR. It is, however, allowed to QR, as reflected by the two LFs proposed in (35b-i) and (35b-ii):

(35) Functional answer to *wh*$_{SUBJ}$-$\forall_{DO}$ question: PX (cf. (32b))
a. The question: [SUBJ Kuka] t rakastaa [DO joka koiranomistajaa$_i$]?
Surface syntax: [CP Who [C° [IP t loves every dog owner]]]
LF: [CP Who [2 [C° [IP every dog owner [1 [IP t$_2$ love t$_1$]...]
b. The answer: [SUBJ Koiransa$_{*i}$]
Surface syntax: [FP Her(/his) dog [F°+E [IP <t love every dog owner>]]]
LF: (i) [IP every dog owner [1 [IP <u>her</u>$_1$ dog love t$_1$]]] *or*
(ii) [IP <u>her</u>$_{*1}$ dog [2 [IP every dog owner [1 [IP t$_2$ love t$_1$]...]

Looking at the LFs in (35b), we see that the unacceptability of the PX-answer only follows straightforwardly if the subject QRs, as it does in (35b-ii). The configuration in (35b-i) is almost identical to the LF in (34b): the only difference is the presence of an intervening λ-binder. Although it could be possible to devise an explanation for the unavailability of a bound reading in (32b) that relies on this difference, data with pronoun+PX support the idea that the subject undergoes QR in (35). First, in (36a), the bound reading is expectedly unavailable: pronoun+PX cannot be bound by a local, c-commanding antecedent. In (36b), however, the bound reading is marginally possible. As this is ruled out by the configuration in

(35b-i) (where a local c-commanding binder is present), I tentatively conclude that the unavailability of a functional answer with a bound reading of a PX, as in (32b), is due to a *strong preference* of the subject to QR.

(36) Functional answer to wh_{DO}-$\forall_{SBJ}$ (a) vs. wh_{SUBJ}-$\forall_{DO}$ (b) question: pronoun+PX (cf. (33))
- a. The answer: [$_{DO}$ Hänen koiraansa$_{*i}$]
  LF: [$_{IP}$ every dog owner [2 [$_{IP}$ her$_{*2}$ dog [1 [$_{IP}$ t_2 loves t_1]…]
- b. The answer: [$_{SUBJ}$ Hänen koiransa$_{?i}$]
  LF: (i) [$_{IP}$ every dog owner [1 [$_{IP}$ her$_{*1}$ dog love t_1]]] *or*
  (ii) [$_{IP}$ her$_{?1}$ dog [2 [$_{IP}$ every dog owner [1 [$_{IP}$ t_2 loves t_1]…]

The suggestion that the subject *prefers* to QR is very much in line with the Minimalist approach to WCO taken by Pica & Snyder (1995), who argue that WCO effects are "scope preference effects". However, Pica & Snyder's system takes all quantifier phrases to be preferably interpreted in their case-marking positions (AgrS, AgrO, AgrIO), which is possible if the A/Ā-movement steps that these phrases undergo are able to introduce λ-binders. I adopt their main idea but not their implementation, conceding all the while that a syntactic account not in terms of QR but in terms of A/Ā-movement is conceivable.

3.3. Ditransitives: direct vs. indirect objects

If the DO and IO of a ditransitive structure are base-generated in a configuration where one object is higher than the other, then we should find that the availability of functional answers depends on which object is fronted (with the familiar proviso that the type of the bound variable matters in Finnish). Whichever object is initially in a higher position should not allow for functional answers when *wh*-fronted. What we find is that in bare PX functional answers, the IO patterns, with respect to the DO, as the DO patterns with respect to the subject (32a): a functional bare PX fragment answer is available. In contrast, the DO patterns, with respect to the IO, as the subject patterns with respect to the DO (32b): a functional bare PX fragment answer is not available. The data is shown in (37).

(37) Functional answers in Finnish: DO vs. IO, bare PX
- a. A: [$_{IO}$ Kenelle] Mari$_j$ esitteli [$_{DO}$ joka vieraan$_i$]?
  who-ALL Mari-NOM present-PAST.3SG every guest-ACC
  'To whom did Mari present every guest?'
  B: [$_{IO}$ Kaimalleen$_{i/j}$]
  namesake-ALL.PX/3
  'To her/his namesake'
- b. A: [$_{DO}$ Kenet] Mari$_j$ esitteli [$_{IO}$ joka vieraalle$_i$]?
  who-ACC Mari-NOM present-PAST.3SG every guest-ALL
  'Whom did Mari present to every guest?'
  B: [$_{DO}$ Kaimansa$_{*i/j}$]
  namesake-ACC.PX/3
  'Her/his namesake'

Moreover, the bound reading is impossible with pronoun+PX if the fragment corresponds to the IO (as in (33a), where the fragment is the DO), but marginally possible if the fragment corresponds to the DO (as in (33b), where the fragment is the subject). This is shown in (38).

(38) Functional answers in Finnish: DO vs. IO, pronoun+PX

a. A: [$_{IO}$ Kenelle] Mari$_j$ esitteli [$_{DO}$ joka vieraan$_i$]?
who-ALL Mari-NOM present-PAST.3SG every guest-ACC
'To whom did Mari present every guest?'

B: [$_{IO}$ Hänen kaimalleen$_{*i/*j/k}$]
her/his-GEN namesake-ALL.PX/3
'To her/his namesake'

b. A: [$_{DO}$ Kenet] Mari$_j$ esitteli [$_{IO}$ joka vieraalle$_i$]?
who-ACC Mari-NOM present-PAST.3SG every guest-ALL
'Whom did Mari present to every guest?'

B: [$_{DO}$ Hänen kaimansa$_{?i/*j}$]
his/her-GEN namesake-ACC.PX/3
'Her/his namesake'

The parallelisms between (32)/(37) and (33)/(38) indicate that the DO is in the same structural relationship with the IO as the subject is with the DO. Assuming the order SUBJ>DO, the data supports DO>IO as the base-generated order of Finnish ditransitives.

If we look at the relevant LFs, we find – as expected – that the proper binding configuration for PX is established if and only if DO>IO; if the order was the reverse, we would see the opposite acceptability pattern.

(39) Functional answer to *wh*$_{IO}$-$\forall_{DO}$ question: PX (cf. (37a))

a. The question: [$_{IO}$ Kenelle] Mari esitteli [$_{DO}$ joka vieraan$_i$] t ?
Surface syntax: [$_{CP}$ Who [$_{C°}$ [$_{IP}$ Mari present every guest t]]]
LF: [$_{CP}$ Who [1 [$_{C°}$ [$_{IP}$ every guest [2 [$_{IP}$ Mari present t_2 t_1]...]

b. The answer: [$_{IO}$ Kaimalleen$_i$]
Surface syntax: [$_{FP}$ Her(/his) namesake F°+E [$_{IP}$ <Mari present every guest t>]]
LF: [$_{IP}$ every guest [2 [$_{IP}$ <u>her</u>$_2$ namesake [1 [$_{IP}$ Mari present t_2 t_1]...]

(40) Functional answer to *wh*$_{DO}$-$\forall_{IO}$ question: PX (cf. (37b))

a. The question: [$_{DO}$ Kenet] Mari esitteli t [$_{IO}$ joka vieraalle$_i$]?
Surface syntax: [$_{CP}$ Who [$_{C°}$ [$_{IP}$ Mari present t every guest]]]
LF: [$_{CP}$ Who [2 [$_{C°}$ [$_{IP}$ every guest [1 [$_{IP}$ Mari present t_2 t_1]...]

b. The answer: [$_{DO}$ Kaimansa$_{*i}$]
Surface syntax: [$_{FP}$ Her(/his) namesake F°+E [$_{IP}$ <Mari present t every guest>]]
LF: [$_{IP}$ <u>her</u>$_{*1}$ namesake [2 [$_{IP}$ every guest [1 [$_{IP}$ Mari present t_2 t_1]...]

Recall that for Chierchia (1991; 1993), the availability of a functional fragment answer depends on whether the *a*-index of the functional trace within the *wh*-question may be bound without a WCO-violation. Under the assumption that the order of the two objects is DO>IO, the functional semantics of the question in (40) – but not (39) – involves a WCO-violation. In other words, Chierchia's approach also predicts the unavailability of the PX-answer in (40b).

However, relying on the syntax and semantics of the *wh*-question in order to determine the availability of a functional answer is problematic when it comes to explaining the difference in availability between functional fragment answers with bare PX (39-40) and pronoun+PX (41). The problem is that the answers in (41) may address the very same questions that (39) and (40) do. Under the ellipsis approach, however, the unavailability of a bound reading for pronoun+PX in (38a) follows, as pronoun+PX must not be bound by a local c-commanding antecedent. The marginal availability of a functional answer in (38b) is possibly due to the lack of a c-commanding antecedent.

(41) Functional answer to wh_{IO}-$\forall_{DO}$ (a) vs. wh_{DO}-$\forall_{IO}$ (b) question: pronoun+PX (cf. (38))
a. The answer: [$_{IO}$ Hänen kaimalleen$_{*i}$]
LF: [$_{IP}$ every guest [2 [$_{IP}$ her$_{*2}$ namesake [1 [$_{IP}$ Mari present t_2 t_1]...]
b. The answer: [$_{DO}$ Hänen kaimansa$_{?i}$]
LF: [$_{IP}$ her$_{?1}$ namesake [2 [$_{IP}$ every guest [1 [$_{IP}$ Mari present t_2 t_1]...]

To conclude this section, let us briefly look at an interesting contrast that arises when we compare functional fragment answers with "filled-in" answers that are information-structurally congruent with the question. Recall that we are assuming that the DO>IO order is base-generated, and IO>DO is derived by scrambling (Kaiser 2000; 2002). In Finnish ditransitives that are answers to a question with a fronted IO, question-answer congruence requires that the IO, which provides the *new* information requested in the question, be aligned to the right, as the contrast between (42a) and (42b) shows (Vilkuna 1995; Kaiser 2000; 2002). In DO-questions, both orders (42c) and (42d) are acceptable.

(42) Question-answer congruence and right-alignment
[$_{IO}$ Kenelle] Mari esitteli [$_{DO}$ Minnan$_i$]?
who-ALL Mari-NOM present-PAST.3SG Minna-ACC
'To whom did Mari present Minna?'
a. Mari esitteli [$_{DO}$ Minnan] [$_{IO}$ Irmalle]
Mari-NOM present-PAST.3SG Minna-ACC Irma-ALL
'Mari presented Minna to Irma'
b. # Mari esitteli [$_{IO}$ Irmalle] [$_{DO}$ Minnan]
Mari-NOM present-PAST.3SG Irma-ALL Minna-ACC
[$_{DO}$ Kenet] Mari esitteli [$_{IO}$ Irmalle]?
who-ACC Mari-NOM present-PAST.3SG Irma-ALL
'Whom did Mari present to Irma?'
c. Mari esitteli [$_{IO}$ Irmalle] [$_{DO}$ Minnan]
Mari-NOM present-PAST.3SG Irma-ALL Minna-ACC
'Mari presented Minna to Irma'
d. Mari esitteli [$_{DO}$ Minnan] [$_{IO}$ Irmalle]
Mari-NOM present-PAST.3SG Minna-ACC Irma-ALL

The contrast between fragment answers and full answers becomes apparent when we align the constituent that appears in the fragment answer to the right, and "fill in" the rest of the answer. (43a) corresponds to the functional fragment answer from (37a), and (43b) to a full functional answer with intuitively the same meaning. Both answers are acceptable. (43c), however, corresponds to the *unacceptable* functional answer from (37b), and now, the full right-aligned version of the answer in (43d) is *acceptable*.

(43) Functional vs. full answers in Finnish: DO vs. IO, bare PX (cf. (37))
[$_{IO}$ Kenelle] Mari$_j$ esitteli [$_{DO}$ joka vieraan$_i$]?
who-ALL Mari-NOM present-PAST.3SG every guest-ACC
'To whom did Mari present every guest?'
a. [$_{IO}$ Kaimalleen$_{i/j}$]
namesake-ALL.PX/3
'To her/his namesake'
b. Mari$_j$ esitteli [$_{DO}$ joka vieraan$_i$] [$_{IO}$ kaimalleen$_{i/j}$]
Mari-NOM present-PAST.3SG every guest-ACC namesake-ALL.PX/3
'To her/his namesake'

[DO Kenet] Mari$_j$ esitteli [IO joka vieraalle$_i$]?
who-ACC Mari-NOM present-PAST.3SG every guest-ALL
'Whom did Mari present to every guest?'

c. [DO Kaimansa$^{*i/j}$]
namesake-ACC.PX/3
'Her/his namesake'

d. Mari$_j$ esitteli [IO joka vieraalle$_i$] [DO kaimansa$_{i/j}$]
Mari-NOM present-PAST.3SG every guest-ALL namesake-ACC.PX/3
'Her/his namesake'

If we assume with Kaiser (2000, 2002) that the IO-DO surface order is derived via a scrambling step (possibly A-scrambling) that creates new scope configurations, unlike Ā-movement, and is crucially not undone by QR, the contrast dissolves: the variable contained inside the DO in (43d) is simply bound by the scrambled IO, as shown in (44).

(44) Full answer LF allows binding in (43d) (cf. (43c))
a. The question: [DO Kenet] Mari esitteli [IO joka vieraalle$_i$]?
b. The answer: Mari esitteli [IO joka vieraalle$_i$] [DO kaimansa$_i$]
Surface syntax: [IP Mari present [... every guest [... her namesake t]]]
LF: [IP every guest [2 [her$_2$ namesake [1 [IP Mari presented t$_2$ t$_1$]]]

On the ellipsis approach, questions and fragment answers are linked through the fact that the antecedent for the elided IP is found in the question. When there is no ellipsis, usual rules of binding apply. Hence, the data in (43) is unsurprising: the IP of the question shows no evidence of a scrambling step of the IO in (37b), and therefore, we can conclude that no such scrambling step is postulated for the resolved IP (hence the unacceptability of the bound reading). However, we now predict that *if* such evidence were available, i.e. if the question did involve scrambling, the binding of the bare PX would be possible. I leave the exploration of this prediction for the future.

3.4. A note on English: direct vs. indirect object

Before we conclude, let us take a very brief look how the functional answer diagnostic fares with English ditransitives. If we assume that DOCs are IO>DO and PDCs are DO=IO, we predict that (i) in DOCs, functional answers are available in DO-questions, but not in IO-questions, and (ii) in PDCs, functional answers are available in both IO- and DO-questions (given that either QP may move first; Bruening 2001).

IO-questions based on a DOC are only acceptable in certain dialects of English. Bruening (2001: 236) provides an acceptability judgment for the availability of a *pair-list* (PL) reading of an IO-questions constructed out of a DOC, as well as a judgment for the availability of this type of answer for a DO-question constructed out of a PDC. A pair-list answer specifies pairs of values corresponding to the two *wh*-phrases in a multiple-*wh* question, and the *wh*-phrase and the restriction of a quantifier in the case of a single-*wh* question with a quantifier. A PL answer can be thought of as spelling out the graph of the function given in a functional answer (Chierchia 1991; 1993, Dayal 1996). Therefore, it is interesting to look at Bruening's data, shown in (45).

(45) Pair-list readings of *wh*-questions with two objects (Bruening 2001: 236)
a. [DO Which book] did you give t [IO to every student]? PDC: PL OK
b. [IO Which student] did you give t [DO every book]? DOC: *PL

So far, so good: an IO-question constructed out of a DOC cannot be answered with a PL answer, and a DO-question constructed out of a PDC can. If functional answers and PL answers are indeed related to each other, the data in (45) corresponds to what we expect. The other two possibilities are shown in (46). The availability of PL answers is also as expected.

(46) Pair-list readings of *wh*-questions with two objects (continued)
a. [$_{IO}$ To which student] did you give t [$_{DO}$ every book]? PDC: PL OK
b. [$_{DO}$ Which book] did you give [$_{IO}$ every student]? DOC: PL OK

What we need to show now is that the availability of functional answers shows the same pattern as in (45) and (46), and that moreover, they correspond to what the we predicted above. The judgments in (47) do just that.

(47) Functional answers to *wh*-questions with two objects
PDC:
a. [$_{DO}$ Which book] did you give t [$_{IO}$ to every student$_i$]?
– His/her$_i$ own.
b. [$_{IO}$ To which student] did you give [$_{DO}$ every book$_i$] t?
– Its$_i$ owner.
DOC:
c. [$_{IO}$ Which student] did you give t [$_{DO}$ every book$_i$]?
– *Its$_i$ owner.
d. [$_{DO}$ Which book] did you give [$_{IO}$ every student$_i$] t?
– His/her$_i$ own.

4. CONCLUSION

In this paper, I provided further binding-based evidence for Kaiser's (2000; 2002) analysis of Finnish ditransitive structures, which she argues are underlyingly DO>IO (and IO>DO being derived by scrambling). I used the diagnostic of functional fragment answers to show that functional fragment answers to questions with a *wh*-DO and a universal quantifier IO (or a *wh*-SUBJ and a universal quantifier DO) are *not* well-formed when the variable takes the form of a possessive suffix, but *may* marginally be so when the variable is a pronoun+possessive suffix combination. In contrast, functional fragment answers to questions with a *wh*-IO and a universal quantifier DO (or a *wh*-DO and a universal quantifier SUBJ) *are* well-formed when the variable is a possessive suffix, and are *not* well-formed when the variable is realized as a pronoun+possessive suffix combination. For Finnish, this pattern follows if we consider the general binding patterns of the two types of variables, and if we assume that subjects c-command DOs, and IOs c-command DOs (unless scrambling takes place). In particular, I accounted for the data by adopting Merchant's (2001, 2004) analysis of fragment answers, a standard view of variable binding through QR, and Bruenings's (2001) proposal according to which QR is subject to Shortest (Richards 1997). An alternative approach, i.e. Chierchia's (1991; 1993) proposal that relies solely on the syntax and semantics of the *wh*-question addressed by the functional fragment answer, was shown to be challenged by the fact that the availability of a functional fragment answer with a bound reading is sensitive to the *type* of variable that appears in the fragment answer (not in the *wh*-question).

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