

On Tough Movement

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Abstract: The problematique of Tough Movement (*Kate_i is easy to please e_i*) is addressed as four problems: (i) What gives rise to the one-to-one correlation between a non-expletive subject and a clausal complement with a gap; (ii) How does the subject link to the gap; (iii) How does the gap enter into the \bar{A} -system in its clause and why does it show anomalous properties; (iv) What determines the distribution of Tough Movement. (i) and (ii) are shown to follow from the syntax and interpretation of non-thematic positions. Much of (iii) suggests that the gap does not move but enters pure \bar{A} -Agree with the C of its clause, combining the virtue of earlier \bar{A} and *pro* approaches. (iv) is addressed more vaguely in terms of the latter hypothesis and the need of pure \bar{A} -Agree to be externally identified.

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1 The problem

(1) illustrates *Tough Movement* TM. A group of adjectives and nouns like *easy* or *a cinch*, *TM triggers*, show the alternation (1)a vs. (1)b. In the former construction, TM itself, the trigger's [Spec, TP] is filled by a non-expletive subject, the *TM subject*, which is not selected for by the TM trigger and interpreted in a gap in a reduced clausal complement of the TM trigger, the *OP clause*. In the second construction, the *clausal subject construction*, the TM trigger takes a full gap-less clausal complement as its subject, (1)c, or the trigger's [Spec, TP] is expletive and the clausal complement follows the TM trigger, (1)b.

(1)

- a. The stone_i is easy to lift *e_i/*it_i* (without dropping *pg*).
- b. It is easy (for Kate) to lift the stone/*it/*e* (*without dropping *pg*).
- c. (For Kate) to lift the stone is easy.
- d. The stone_i is *(im)possible (for John) / *seems / * α Kate [to lift *e* [without dropping *pg*]].
- e. The book was easy to give him/*John *e*.

TM raises a problématique which I will lay out as four problems.

First, the *subject-gap correlation problem*: the presence of a non-expletive TM subject correlates one-to-one with the presence of an \bar{A} -gap in the clausal complement of the TM trigger, namely the OP clause. Neither can occur without the other. If the clausal complement lacks a gap, the TM subject must be the clause itself (1)c or the *it* expletive, (1)b. If the TM subject is present, the clausal complement must have a gap, (1)a.

Second, the *subject-gap linking problem*: it is not clear how the TM subject and the gap relate in the syntax and semantics. Selectional restrictions indicate the TM subject is thematically interpreted solely in the gap. Quantificational properties of the TM subject turn out to be only interpreted at its surface structure position. The TM subject is in an A-position, but the gap is related to it via an \bar{A} -step.

Third, the *OP-gap problem*: even though it is clear that an \bar{A} -relation between the top of the OP clause and the gap in it, giving an island-sensitive unbounded dependency with some typical

\bar{A} characteristics, it displays some quite anomalous properties, such as the inability to affect the direct object of the double object construction when the indirect object is a full DP, (1)e.

Fourth, the *selection problem*: the nature of the selectional and locality relations in which the TM configuration is possible, (1)d. Beside TM triggers such as *impossible*, there are others things that look like TM triggers but aren't, like *(not) possible*; there are non-thematic raising predicates which thus parallel *easy* but can't take OP clauses like *seem*; and there are no TM triggers like α where the relation between the TM subject and the OP clause can cross an argument with structural Case, though obliques are fine.

After delineating the basic properties of TM construction in the next section, this paper addresses these problems. Section 3 is the development of a predication analysis that unifies *tough*-movement with another construction that displays some of its core properties, copy-raising, and the two with the interpretation of non-thematic positions in general, including those derived by movement. The mechanisms deployed for linking the TM subject to the OP-gap chain in the OP clause are those needed for the syntax and interpretation of movement anyway. The result is a fairly explanatory answer to the subject-gap linking problem and a relatively good handling of the subject-gap linking problem; the system also correctly accounts for the similarities and differences between TM, movement, and copy-raising. Section 4 examines the nature of the OP-gap relation within the OP clause, and suggests a hypothesis which makes an inroad into some of its anomalous properties: the gap is a null pronoun which enters into pure \bar{A} -Agree with the C of the OP clause but not any \bar{A} -movement. Finally, many aspects of the selection problem, which boils down to why OP clauses with their special properties occur only where they do, remain untouched; to sharpen the question, section 4.4 examples how the properties of OP clauses stack up against those of other "null operator" constructions.

There is a long history to the analysis of the TM construction, beginning with Chomsky 1964:61ff. Rosenbaum 1965:194ff., Postal 1971, Postal and Ross 1971, Berman 1973, Brody 1993, Hornstein 2000:chapter 3, propose a movement transformation relating the gap and the TM subject, in the case of the last two authors giving an $A-\bar{A}-A$ movement chain. Lasnik and Fiengo 1974 develop a full object-deletion account suggested earlier by Ross 1967 and Akmajian 1972. Williams 1983, Wilder 1991, Dalrymple and King 2000, and many others, develop theories where it is the TM trigger and the relation to the gap is indirect. Chomsky 1973, 1977, 1981:309ff argues for an \bar{A} -chain in the OP clause, which most later work takes as a point of departure. Chomsky 1981 links up the TM subject to the gap via a widely-criticized complex predicate reanalysis of the in-between material at S-structure (cf. Nanni 1978, 1980 vs. Levine 1984ab).¹ Browning 1989 links up the TM subject and the OP-gap chain by a version of Williams's 1980 Predication Theory. To account for the correlation problem, Chomsky 1986b hypothesizes that OP alone is not enough to identify a variable as such and "strong binding" by an explicit range-assigner, the TM subject, is needed; to address the same problem, Browning 1989 takes OP as an \bar{A} *pro* in need of being ϕ -identified by the TM subject. The proposals in section 3 are closest by far to Browning's analysis, and could be viewed as a combination of the predication analysis with the use of Agree to identify predicate variables independently justified by the syntax and interpretation of movement and copy-raising.

Why is TM important? The subject-gap correlation and linking problems are a tough, sometimes even at times paradoxical, problem for many theories of the syntax of long-distance dependencies (cf. Holmberg 2001:839). The linking is anomalous in involving an \bar{A} -step

¹ This interestingly leads to the reintroduction of generalized transformations in Chomsky 1995:chapter 3 to allow the S-structure insertion of complex subjects; cf. Uriagereka 2000, Lasnik and Uriagereka 1988:147.

between two A-positions, and interpretation of thematic properties in one position and quantificational ones necessarily in another. The correlation is troubling because there is a complete \bar{A} -chain (or on a different view, a *pro*) in the OP clause whose existence, unlike that of other \bar{A} -chains and other *pro*'s, depends on a separately base-generated DP, the TM subject. I aim to show that most of these core anomalies follow from syntactic mechanisms that are needed anyway to derive and interpret more orthodox structures.

2 Basic properties of Tough Movement

I start out from the conclusion of Berman 1973, Chomsky 1981:309ff., Brody 1993, among others, that the TM subject is not selected by the TM trigger. The position in which it appears can be filled by the *it* expletive in the clausal subject construction (2) (I return to the problem of *there* expletives in 3.2). It is subject to selectional restrictions imposed on the gap in the OP-clause, as Lasnik and Fiengo 1974:536ff. demonstrate at length, (3); we may speak of it being thematically interpreted in the gap.² However, its higher-order (quantificational) properties are not interpreted in the gap, (4). Deriving these facts will be a major result of section 3.

(2)

- a. Nearly every dragon_i is easy for his_i foe to like *e*.
- b. It is easy for his_{*i/j} opponent to like nearly every dragon.

(3)

- a. Mary is graceful to dance with *e*.
- b. The flight of these birds is graceful.
- c. *The flight of these birds is graceful too dance with *e*.
- d. *I danced with the flight of these birds.

(Lasnik and Fiengo 1974:536)

(4) Nothing is hard for Melvin to lift \neq It is hard for Melvin to lift nothing. (Postal 1974:356)

An alternative hypothesis that has been proposed is that the TM subject is interpreted as an argument of the TM trigger, in the same way as when the TM trigger appears with a only a DP argument in *Old Saxon is easy*, and that the infinitive is an adjunct; cf. Williams 1983, Wilder 1991. However, semantically that makes no sense (cf. Heycock 1994:259ff.). There are no relations such as entailment between the two constructions when both are available to TM triggers, (5)a-(5)c, such as we expect when adjunct interpretation is involved, (5)d. On the other hand, the TM and clausal subject constructions are linked by entailment, as in (5)e: truth of the TM constructions implies truth of the clausal subject construction for existential closure of the gapped position in the OP-clause (I use $x \subset y$ for x entails y).

(5)

- a. The stone is not easy [to lift *e*] $\not\subset$ #The stone is easy.
- b. The hatchet is easy [to bury *e*] $\not\subset$ #The hatchet is easy.

² Wilder 1991:123, 128-9 notes some intriguing but limited counter-examples:

- (i) [For him to be top of the class] is hard to believe *e*. (Wilder 1991:123)
- (ii) *I believe for him to be the top of the class. (Wilder 1991:123)

- c. The flight of birds is graceful $\not\subset$ #The flight of birds is graceful to dance with *e*.
- d. Kate bought the book [to read *e*] \subset Kate bought the book.
- e. The stone is not easy [to lift *e*] \subset $\exists x$ ([to lift *x*] is easy)

If the TM subject's position is non-thematic, we expect it to support idiom chunks selected for in the gap. However, only some are permitted. Two alternative hypotheses seem compatible with the data: that the permitted idiom chunks are those which may head restrictive relative clauses (6) (cf. Lasnik and Fiengo 1974:542n4), or those that they are those which can also enter into control and so are not true idiom chunks, but rather parts of "idiomatically combining expressions" (Nunberg et al. 1994). In neither case does there appear to be a perfect match with the other diagnostic involved, relativization and control (cf. also Horn 2003:265, 267ff.); I leave the matter here.

(6)

- a. ?Headway is easy to make on problems like these. (Lasnik and Fiengo 1974:540)
- b. The headway that we made was insufficient. (Lasnik and Fiengo 1974:541)
- c. *Tabs were easy to keep on Mary.
- d. *The tabs that we kept paid off.

Some aspects of the internal structure of the OP-clause are quite clear. The gap enters into the system, Chomsky 1977, 1981, 1982, Browning 1989; I review the grounds for this conclusion in section 4.2. Both Browning 1989:chapter 2 and Heycock 1994:258 assume that the OP-gap chain terminates not in the OP clause but rather in a maximal projection of the TM trigger, sister to which the TM subject base-generated. However, there is fairly straightforward evidence that the OP-chain does not continue outside of the OP clause. As reviewed in section 4.2, the OP-gap chain constitutes a weak island to *wh*-extraction from within the infinitive, e.g. (7)a. A TM trigger may take an experiencer argument outside the OP-clause, as discussed below (see the structure in (11)). If OP-movement continued into the AP it would have to be past the experiencer argument, and we would expect its extraction to be degraded and subject to D-linking. This is not the case, (7)b, (7)c.

(7)

- a. *How intelligent is John easy to think of / regard as *e*? (cf. Chomsky 1981:311)
- b. [For how many people]₁ is a person₃ easy *t*₁ PRO₁ to ignore *e*₃? As many as suffice to make a crowd.
- c. [For how many of their₃ acquaintances₂]₁ are most people₃ easy *t*₁ PRO₂ to exasperate *e*₃? As many as make up their family.

The topmost clause of the OP clause must be non-finite, (8)d and cannot license an overt subject, (8)a, (8)b; the availability of partial control (9) shows that the subject of the topmost clause of the OP clause must be PRO, rather than an argument which participates in restructuring (cf. Landau 2000).³ A *for*-phrase between the adjective and the infinitive is necessarily to be

³ As with *try*, there is degradation with a passive infinitive (Lasnik and Fiengo 1974), though it seems to me that it can be obviated by not putting the gap in the *by*-phrase.

- (i) *John is easy (for Bill) to be outsmarted by *e* (, for Bill). (Lasnik and Fiengo 1974:552)
- (ii) Chess is easy to be outsmarted by John at *e*.

analyzed as an experiencer argument of the adjective, and thus unlike the subject of *for-to* infinitives the *for+DP* sequence here are extractable as in (7) above (Lasnik and Fiengo 1974:549). TM triggers in the clausal subject constructions tolerate both finite complements (8)e and specified subject infinitives (8)c, so the preceding subjecthood limitations are clearly part of what makes an OP-clause, like the OP-gap chain.

(8)

- a. *North Vietnam is easy for there to be bombing raids over *e*. (Lasnik and Fiengo 1974:549)
- b. *The hard work is pleasant for the rich for the poor to do. (Chomsky 1981:312)
- c. It is easy for the rich [for the poor to do the hard work]. (Chomsky 1981:310)
- d. *John is easy that anyone likes *e*. (Browning 1989:126)
- e. It is difficult for Bill that John won the race. (Browning 1989:127)

(9)

- a. This café is easy for me PRO_{me+x} to meet in *e* at six.
- b. This café is difficult for Mary PRO_{Mary+x} to kiss in *e*.

The *for*-PP experiencer of TM triggers need not be realized overtly, but Epstein 1984 argues it to be present as a covert universal argument if it is not. If overt at any rate, the DP of the *for*-phrase necessarily controls interpretation of the subject of the OP clause.⁴ This derives Lasnik and Fiengo's 1974:564n16 observation that full DPs in the OP clause must be disjoint from the experiencer, via Condition C (cf. Chomsky 1981:204ff., 1986b:109); this includes the gap as an \bar{A} -trace (cf. section 4.3.4).

Consider now how the TM trigger, the *for*-PP experiencer, and the infinitive assemble. Heycock 1994:257-8 shows that the infinitive ends up adjoined to a maximal projection of the TM trigger below the attachment site of adverbs like *yesterday*, (10)b, (10)c; there is a lower maximal projection of the TM trigger which is moveable without the infinitive (10)a.

(10)

- a. [How difficult (for George)] is Janice *t* (for George) [PRO to forget *e*] (extending Heycock 1994:257)
- b. [How difficult] were the children (?*yesterday) to control (yesterday) (Heycock 1994:257)
- c. The papers were tough for me (?*yesterday) to grade (yesterday). (Heycock 1994:258)

However, there is also evidence that the infinitive starts out below the *for*-PP experiencer, simply because the experiencer if present obligatorily controls the PRO argument of the infinitive.⁵ Thus, I assume the infinitive originates as the complement of the TM trigger.

Together, this motivates the following structure; in section 3.3 that I will argue the TM subject has no lower copy-theoretic representation as assumed here:

- (11) They₃ were [_{AP} [_{AP} [_{AP} easy *t*₁] [_{PP} for me₂]] [_{CP} OP₃ PRO₂ to grade *e*₃]₁] yesterday.

(iii) Mere facts are always easy to be beaten over the head with *e*.

⁴ Note that other *for*-phrases, e.g. left-peripheral ones, may have sources other than a preposed experiencer; see Browning 1989, Hukari and Levine 1991 for discussion.

⁵ Wilder 1991:132n9 gives general evidence that the *tough/easy* class of is ergative.

As already noted, the TM subject is thematically interpreted in the gap in the OP clause and quantificational in [Spec, TP] of the TM trigger; this will be predicted by the predication approach to be developed in section 3, and is also the case in copy-raising. There are also hints of other, more mysterious effects on the interpretive relation between the TM subject and the OP clause. Consider the following data-set, where an analogue of each of the ungrammatical sentences would be fine if the TM trigger stood in the clausal subject construction:

(12)

- a. The man was hard for Mary to find attractive/*sick. (Dalrymple and King 2000:14)
- b. The children were difficult for us to return unharmed/*exhausted. (Dalrymple and King 2000:14)
- c. *The money was tough for John to lack *e*. (Dalrymple and King 2000:14)
- d. *That expensive dress was easy for Mary to want *e*. (Dalrymple and King 2000:14)
- e. *The hardcover edition was hard for the teacher to prefer. (Dalrymple and King 2000:14)
- f. Your cousin is difficult for me to like. (Dalrymple and King 2000:14)
- g. John is illegal to talk to *e*. (Chomsky 1986b:113)
- h. Some plants are illegal to grow *e* in Illinois.
- i. John is impossible/*not possible/easy/*feasible to please *e*. (Brody 1993:9)

Some of these like (12)i seem to be irreducible cases of selection for the OP clause, so that *possible* is simply not a TM trigger; see section 4.4. However in others such as (12)a some property of the OP clause or its relationship to the TM subject must be the relevant factor. Dalrymple and King 2000:14-5, discussing the conclusions of Nanni 1978, conclude from their examples that the TM subject is required to be in a volitional or intentional relation to the predicate (cf. also Kim 1995).⁶ This however is surely incorrect; Goh 2000 gives (13) as a demonstration of the lack of intentionality/volitionality on the part of the TM subject.

(13)

- a. This mountain is difficult to walk up while carrying such a large and cumbersome rucksack.
- b. That Jo wears size 9 shoes is difficult to believe.
- c. The hatchet is hard to bury after long years of war.
(Goh 2000)

A better bet seems Heycock's 1994:262 observation that the TM construction has the properties individual-level predication. Lasnik and Fiengo 1974:560, 563-4 describe TM in similar terms. In the clausal subject construction, the clause is a proposition argument of the adjective, as in *It is tough (on Kate) that Bill solved that problem*, which says nothing about the properties of *the problem* but rather that the clause belongs to the class of *tough (on Kate)* objects. Starting from this as clue to the meaning of TM, the meaning of *tough for Bill to solve e*

⁶ This echoes Lasnik and Fiengo's 1974 observations that the TM subject is compatible with the progressive tensed, the adverb *intentionally*, root interpretation of modals, and being controlled by the subject of *try*: unlike, they claim, both the clausal subject construction of TM triggers, and raising triggers in general with or without raising. However, these correlation don't seem to hold, though (iii) and (iv) could be argued to be control (cf. Martin 1996).

(i) It must seem that windows are broken in order to convince the thieves to ignore the car. (root reading)

(ii) It must be easy to talk to the contestant so that the audience is not too intimidated. (root reading)

(iii) Now that things are seeming to come back under some control...

(iv) Lunfan intentionally seems to be blurring the line between "puppet theater for adults" and "adult theater."

seems to be that $P = \text{'Bill solves } x \text{'}$ belongs to the class of *tough (for Bill)* objects'. The meaning of the whole *This problem is tough for Bill to solve* is then that P is an individual-level property of *that problem*, which binds x within P . This predication between *that problem* and P is due to just the interpretation of non-thematic positions, as section 3 argues. The fact that the predication is individual level may be a consequence of the fact that the TM subject is base-generated in [Spec, TP] of the TM trigger, as discussed in section 3.3. It remains to be seen how far properties of individual-level predication account for the data-set (12).⁷

3 The Predication analysis

3.1 Predication as interpretation of non-thematic DPs

In the next three sections, I summarize the syntax-semantic mapping of DPs base-generated in non-thematic positions from Rezac 2004a:chapter 3, 2004b. TM turns out to fit exactly into the range of predicted possibilities, accounting for the subject-gap correlation and linking problems, and the differential interpretation of the subject thematically in the gap and quantificationally in its surface position.

A DP in a thematic position receives its interpretation by composing with its sister, (the projection of) the lexical entry of which has a corresponding λ -abstract, as in (14).⁸

(14) Lexical entry for *love*: $\llbracket \text{love} \rrbracket = \lambda x \in D_e. \lambda y \in D_e. y \text{ loves } x$

An DP in a non-thematic position is interpreted because its sister is a derived predicate, that is a λ -abstract which is not introduced by its lexical entry but by an interpretive rule, (15)a (Heim and Kratzer 1998). Syntax, particularly movement, must determine that when the sister of *the girl* in (15)a is translated as a derived predicate, the λ -abstract introduced must bind x_1 from

⁷ Two constructions are often brought in relation to TM: degree clauses and complement object deletion. Degree clauses appear to have quite a different semantics; *John is too stubborn to expect anyone to talk to* does not entail that *Expecting anyone to talk to } is too stubborn* for any x , which is also reflected in the impossibility of *It is too stubborn to expect anyone to talk to John*. Whether there is entailment that *John is too stubborn* depends on how to analyze examples like *Harry is too tall (to cram into a breadbox)*, pointed out by Lasnik and Fiengo 1974:548-9n6, and thus on the semantics of degrees and their standards of comparison. The syntax of degree triggers is also different; cf. note 29. They are perhaps best analyzed with a different analysis for the attachment of the infinitive, e.g. as a result adjunct, similar to purpose infinitive adjuncts (see Browning 1989 on the latter).

Complement object deletion cases like *Mary is pretty to look at* share with degree clauses the fact that there is no entailment to *It is pretty to look at } and problematic entailment in the other direction in *This floor is slippery (to dance on)*. However, they differ in that the infinitival clause shows very sharp ungrammaticality when the gap is embedded (Schachter 1981, Heycock 1994:260), and do not permit either *for*-experiencers (Lasnik and Fiengo 1974:566ff.), or the kind of complete infinitive that degree clauses do as (negative) resultative complements, *Mary is *(too) pretty (for Kate) to look at John*. They are perhaps best analyzed as complex predicates.*

⁸ Here in speaking of a DP I really mean an e -type DP for simplicity. Like an e -type DP (i), a quantifier must compose with its sister turned into a λ -abstract (type $\langle e, t \rangle$) (ii); however, while the λ -abstract in (i) takes an e -type DP as an argument, it is the generalized quantifier denoted by a quantified DP (type $\langle \langle e, t \rangle, t \rangle$) which takes the λ -abstract $\langle \langle e, t \rangle \rangle$ as an argument. In the interpretation, each member of the set of e -type individuals that the generalized quantifier quantifies over, for example *most students*, gets substituted into the variable bound by the derived predicate's λ -abstract. The function-argument relationship is different in the two cases, but the issues addressed in this section, mapping a constituent with an Agree-identified gap to a derived predicate, are the same in both cases.

(i) $DP_{\langle e \rangle}$:	$DP \lambda x [\dots x \dots]_{Pred}$	\Rightarrow	$[\dots DP \dots]$
(ii) $[Q DP]_{\langle \langle e, t \rangle, t \rangle}$:	$QP \lambda x [\dots x \dots]_{Pred}$	\Rightarrow	$Q(DP)(Pred)$

which *the girl* has moved, not another variable such as x_2 ; free binding occurs only when movement is not involved to yield resumptive relatives such as (15)b.

(15)

- a. the girl₁ is not believed by her_{1/2} friend to have come $t'_{1/*2}$ from here.
- b. the girl₁ such₁ that the hobbit thought she_{1/2} came t late into her_{1/2} house.

Therefore, Heim and Kratzer (1998:109ff.) build the introduction of the triggers for λ -abstraction directly into the singular transformation Move. In the syntax, Move maps β and a designated subconstituent α within in as in (16), where β is converted to a structure γ sister to α , where γ properly contains β' , that is β with α replaced by the e -type object t_i (trace/variable), and the index i which identifies t_i as the open variable for α within β' .

(16) Move maps $[\beta \dots \alpha_i \dots]$ to $[\alpha [\gamma i [\beta' \dots t_i \dots]]]$

This structure is interpreted by *Predicate Abstraction* in (17)a, which leads to the interpretation of the index as a λ -operator binding a variable corresponding to index, and an indexed trace as the corresponding bound variable. *Functional Application* (17)b composes the derived predicate β' with its sister α , which substitutes α into variable bound by the λ -abstract, in the case of both derived and of lexical λ -abstracts like (16). A useful short hand is that α λ -binds the variable bound by the λ -operator (Reinhart 2000).

(17) Interpretive rules

- a. Predicate Abstraction (PA): Let α be a branching node with daughters β and γ , where β dominates only a numerical index i . Then, for any variable assignment, a , $\llbracket \alpha \rrbracket^a = \lambda x \in D_e. \llbracket \gamma \rrbracket^{a[x/i]}$. (Heim and Kratzer 1998:186)
- b. Functional Application (FA): If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment a , α is in the domain of $\llbracket \cdot \rrbracket^a$ if both α and β are, and $\llbracket \beta \rrbracket^a$ is a function whose domain contains $\llbracket \gamma \rrbracket^a$. In this case, $\llbracket \alpha \rrbracket^a = \llbracket \beta \rrbracket^a(\llbracket \gamma \rrbracket^a)$. (Heim and Kratzer 1998:105)

Adopting the copy theory for traces does not modify any of the essentials of predication. The interpretation of copies as definite descriptions is developed in Fox 2002. Suppose we have the copy-theoretic structure *every girl left ~~every girl~~*. Fox proposes that copies are interpreted as definite descriptions, with the quantifier of the copy replaced by *the*, and are linked to the corresponding quantifier by having attached to them the predicate $\lambda y(y=x)$ 'is identical to x ' where x is a variable name (index). In order for this to work with the interpretation of movement, the index introduced by *Variable Insertion* (18)a must be the same as that created by Move (16).

(18) Trace Conversion (Fox 2002:67)

- a. Variable Insertion: (Det) Pred \rightarrow (Det) [Pred $\lambda y(y=x)$]
- b. Determiner Replacement: (Det) [Pred $\lambda y(y=x)$] \rightarrow the [Pred $\lambda y(y=x)$]

These tools need to be modified to work in the *Compositional Theory of Movement* CTM proposed in Chomsky 2000:101-2, 2001, 2004:

- (19) CTM: Movement is not a primitive; it is a composition of (at least) the basic structure-building operation Merge and the dependency-forming operation Agree.

Under the CTM, movement is a sequence of Merge and Agree with no hard-wired linking between them. CTM has the advantage of predicting existence of structures like TM and copy-raising, as in (20); here the matrix subject is base-generated independently of the complete clause downstairs (20)a, but the DP it λ -binds is identified by the locality of ϕ -Agree ruling out (20)b (cf. esp. Potsdam and Runner 2001).

(20)

- a. The shoe₁ seems like it₁'s on the other foot.
b. *The other foot seems like the shoes is on it₁.

The issue posed by CTM and addressed in Rezac 2004a:chapter 3, 2004b is how is Merge of [Spec, HP] is constrained to base-generating a DP that λ -binds the goal of H's Agree, which is an independent operation that took place earlier in the derivation when H' was constructed (Rezac 2003). The leading ideas are that it is Agree that transmits the index i in (16), and that i is in fact just a valued ϕ -feature of a probe, so that indices enter syntax as part of the interpretable ϕ -features of DPs. These assumptions are implemented as follows:

(21)

- a. There is an index feature [ix] which is unvalued on ϕ -probes, but valued and interpretable on DPs (cf. number).
b. Variable Insertion (modified): $(\text{Det}[\phi \dots ix=x_n \dots]) \text{ Pred} \rightarrow (\text{Det}[\phi \dots ix=x_n \dots]) [\text{Pred } \lambda y(y=x_n)]$

Under these assumptions, ϕ -Agree values [ix] as it does other ϕ -features, (22); in fact by the *Free Rider Principle* of Chomsky 1995:265f., 268-70, 275 Agree by any feature of H values [ix] on H if present.

- (22) $[\text{HP } H_{[ix]} \dots \text{DP}_{[ix=n]} \dots] \rightarrow_{\text{Agree}} [\text{HP } H_{[ix=n]} \dots \text{DP}_{[ix=n]} \dots]$

Agree now plays the role in triggering PA that in Heim and Kratzer (1998) is played by Move (16): it yields a syntactic representation where the index of the goal of Agree is represented at the top of the constituent whose head triggers Agree. It turns out to be further preferable to formulate PA so that it is triggered by the interpretable index feature of the non-thematic DP which it interprets, as in (23). This lets expletives be ignored if by hypothesis they lack interpretable index features, allows the interpretation of non-thematic DPs sister to non-agreeing predicates in which they thus freely bind any variable (15)b, and removes the worry that Agree-valued index features will have been deleted prior to PA (Rezac 2004a:152ff, 2004b).

- (23) Predicate Abstraction Rule (PA) (modified): Let α be a tree dominating two sub-trees, β and γ , such that β has an index feature [ix=i]; then for any variable assignment a , $\llbracket \alpha \rrbracket^a = \lambda x \in D_e. \llbracket \gamma \rrbracket^{a[x/i]}(\beta)$.

However, this approach requires a mechanism to ensure specifier-head agreement between the derived predicate H', whose head H has the Agree-valued ϕ -probe identifying the variable to

be λ -bound within H', and the DP Merged into [Spec, HP]. I discuss the various possibilities in Rezac 2004b; here it suffices that a mechanism must exist which results in (24), both for the present case and for independent reasons.

- (24) *Match Condition*: if Merge(α , β), then for any ϕ -feature F, the value of F on the label of α and the label of β do not differ.

Here is a brief example of how the system works in the case of movement, now a descriptive label only for an instance of the CTM; the mapping label *Syntax* is the sequence of the independent operations Agree, Merge, Trace Conversion, and the seventh element in the variable assignment function, $a(7)$, is '**Kate**.' Exactly the same mechanism apply in copy-raising (20)a.

- (25)
- | | |
|--------------------------------|--|
| | $[T_{[\phi-]} [VP \text{ left } Kate_{[\phi=3sg, ix=7]}]]$ |
| \rightarrow Syntax | $[Kate_{[\phi=3sg, ix=7]} [T_{[\phi=3sg, ix=7]} [VP \text{ left } [Kate_{[\phi=3sg, ix=7]} \text{ identical.to } x_7]]]]$ |
| \rightarrow Feature deletion | $[Kate_{[\phi=3sg, ix=7]} [T [VP \text{ left } [Kate_{[\phi=3sg, ix=7]} \text{ identical.to } x_7]]]]$ |
| \rightarrow PA | $[[Kate_{[\phi=3sg, ix=7]}]] [\lambda x. [[VP \text{ left } [Kate_{[\phi=3sg, ix=7]} \text{ identical.to } x_7]]]^{a[x/7]}]$ |
| \rightarrow Lexical entries | Kate $\lambda x. [[\lambda y. y \text{ left } [Kate \text{ identical.to } x]]]^{a[x/7]}$ |
| \rightarrow FA | Kate $\lambda x. [Kate \text{ identical.to } x \text{ left}]^{a[x/7]}$ |
| \rightarrow FA | Kate identical.to Kate left |
| = | Kate left |

This system ensures that all DPs base-generated in a non-thematic position as sister to a predicate whose head/label undergoes ϕ -Agree show the core property of movement and copy-raising: the goal to which the DP is interpretively linked is identified by Agree.

3.2 Syntax-semantics mapping in TM structures

In TM, the TM subject is in non-thematic [Spec, TP] sister to T' whose head has a ϕ -probe. This ϕ -probe must find a goal. If the TM trigger has a ϕ -accessible argument closer than the OP-clause, this moves to [Spec, TP] and TM does not result; possibly this is the structure of Complement Object Deletion constructions like *Kate_i is t_i pretty (to look at)*.⁹ TM is therefore confined to raising-type predicates. In such a configuration, the goal for the ϕ -probe is accordingly (in) the OP-clause itself. The idea now is to derive the one-to-one correlation between the TM subject and OP clauses with a gap from the properties of ϕ -Agree, and use the theory developed above to link up the TM subject and the gap.

The subject-gap correlation essentially falls out from the locality of ϕ -Agree under two assumptions: (i) OP is a legitimate goal for ϕ -Agree, even though part of the \bar{A} -system; (ii) the impenetrability of certain CPs to ϕ -Agree resides in their possessing a C that has ϕ -features and thus is itself a goal/intervener for ϕ -Agree. As to (i), Polinsky and Potsdam 2001 for Tsez, and Branigan and MacKenzie 2001, Bruening 2001 for Algonquian, show that ϕ -Agree with a goal in an \bar{A} -position is possible, whether the goal stays within its own clause, on its periphery, or moves up, provided such a goal is itself capable of ϕ -Agree in its own clause. As to (ii), English

⁹ Cf. Branigan and MacKenzie 2001:405, 399n14, Rezac 2004a:136f. for instances of cros-clausal agreement that cease to be so when a ϕ -accessible argument is added to the matrix clause.

examples like (26) clearly show that full CPs can be permeable to ϕ -Agree without the goal entering into the \bar{A} -system. I follow Polinsky and Potsdam's hypothesis that the possibility of such ϕ -Agree reduces to locality, but as reworked in Rezac 2004a:173ff, 2004b in terms of ϕ -locality rather than head government. If a verb has no ϕ -accessible arguments, its T will Agree with the closest ϕ -set in the next lower clause. This can be (the maximal projection of) a head C_ϕ in the C-system, if this head bears lexically specified default ϕ -features. In English, such a CP goal triggers the insertion of the *it*-expletive.¹⁰ If there is a goal in an \bar{A} -position outside the maximal projection of a C_ϕ , ϕ -Agree takes place with it. If there is no ϕ -set in the C-system, ϕ -Agree crosses the CP to reach [Spec, TP] or T(P), as in (26) or in the bare TP complement of raising/ECM predicates. Simple locality determines which goal is available to ϕ -Agree. Thus considering for example Tsez with the clausal architecture in (27), ϕ -Agree of the matrix T is predicted to take place with the closest of a *wh*-phrase, an overt C, a topic, or finally a low nominalizing head, an instance of C_ϕ , that I put in Fin^0 . Polinsky and Potsdam show these predictions are correct; two examples are given in (28).

(26) There seem like (*I think) there are three anthropologists at the conference.

(27) $[_{CP} \text{ wh } [_{C'} C^0 [_{TOPP} \text{ topic } [_{TOP'} \text{ Top}^0 [_{FinP} \text{ Fin}^0 [_{TP} \text{ S O V }]]]]]]$

(28)

- a. eni-r [už-ā magalu-n/gon b-āc'-ru-li] b/*r-iyxo
 mother-D boy-E bread.III.A-TOP III-eat-PST.PRT-NMLZ] III/*IV -know
 'The mother knows the boy ate the bread.' (Polinsky and Potsdam 2001:610)
- b. eni-r [šebi y-āk'i-ru-li] y-iy-x-ānu
 mother-D wh.II.A II-go-PST.PRT-NMLZ II-know-PRES-NEG
 The mother does not know who [of the women] left. (Polinsky and Potsdam 2001:638n20)

I ignore here whether interaction with phase theory needs to be further specified (cf. Branigan and MacKenzie 2001, Bruening 2001, Svenonius 2004), and whether ϕ -Agree is directly with the goal in violation of the Activity Condition (op. cit.) or whether it proceeds via the head the goal has Agreed with in its clause as in Rezac 2004a:199ff. Section 4 here argues that OP in TM is just a C that has \bar{A} -Agreed for ϕ -features by the Free Rider Principle, avoiding the latter problem for English.

Turning to English, ϕ -Agree should be possible with an \bar{A} -goal unless blocked by an intervener; this, I propose, is exactly TM. Like most clauses in English, the clausal complement of TM triggers when TM does not occur has a C_ϕ that intervenes for higher ϕ -Agree and triggers *it* insertion; this gives (29)a. OP-movement either by-passes this barrier as in Tsez, or else the C associated with OP, C_{OP} , has no ϕ -features. Therefore, the ϕ -features carried on OP from the gap are accessible to matrix ϕ -Agree, and the Match Condition requires Merge of a subject matching the index feature of the gap, giving TM (29)b. Without OP-movement, either C_{OP} is a C_ϕ , or PRO counts as the ϕ -intervener, blocking (29)c. PRO itself cannot be the goal, because it is obligatorily controlled by the matrix experiencer whether overt or covert (Epstein 1984), and

¹⁰ This difference can be implemented by giving C interveners a special designated ϕ -set (cf. Lasnik 1999:136), or by assuming that the intervener is really *it* rather than C in a structure $[_a \text{ it CP}]$ ((Rosenbaum 1967:chapters 1, 2, Moro 1997:173ff., Anagnostopoulou 2003:187); see Rezac 2004b for discussion).

further λ -binding by the matrix subject would trigger Condition B or C, (29)d.¹¹ The only case lacking a principled explanation is why the transparent C clauses found in CR cannot serve as the clausal complement of TM triggers, to give (29)e; this needs to be handled by selection, as must be in general both the distribution of both these clauses (available to *seem* but not *be likely*), and of C_{OP} itself to explain why *impossible* but not *possible* is a TM trigger (Brody 1993:8-9).

(29)

- a. It is easy for the rich [C_ϕ for the poor/PRO to read these books].
- b. The books₁ are easy (for Kate) [$OP_1 C_{OP(\phi)}$ PRO to read e_1].
- c. *The books₁ are easy (for Kate) [$C_{(\phi)}$ PRO to read them₁].
- d. *Kate₁ is easy (for her₁) [C PRO₁ to read the books].
- e. *The books₁ are easy (for Kate) [(like) they₁ were read t_1].

The correlation problem of TM is thus solved because ϕ -Agree of T determines permissible [Spec, TP] objects by the Match Condition: C_ϕ as a goal determines *it*, OP as a goal determines a DP that λ -binds OP.

The maximal projection of C_ϕ must also be responsible for ruling out (30), the analogue of which is fine in Algonquian and Tsez, (28)b. This suggests that OP is special among other *wh*-phrases in that it can escape the usual C_ϕ in English, whose maximal projection blocks [Spec, $C_\phi P$] from being ϕ -accessible in (30). Such a distinction between OP and overt operators can be drawn in various ways and correlate with other properties of C; section 4 for example proposes that OP is really pure \bar{A} + ϕ -Agree by C_{OP} with the gap, while other C's such as C_Q of questions which trigger both \bar{A} -Agree and movement must also project [Spec, CP].

(30) *There were asked what things₁ there are to do t_1 in Boston.

An interesting consequence of the proposed syntax is that OP counts as associate of the matrix T/[Spec, TP]. This explains the impossibility of the *there*-expletive as TM subjects, (31), simply through the definiteness effect, if OP is definite or pronominal, e.g. Browning's 1989 *pro*; see 3.3 and 4.¹²

(31)

- a. *There is hard to believe e to have been a crime committed. (Chomsky 1981:309)
- b. It is hard to believe there to have been a crime committed. (Chomsky 1981:318n30)

The semantics of TM is exactly like that of (copy) raising in the relevant respects. If we assume that the OP clause does contain an \bar{A} -fronted *pro* as OP, then this serves as the goal of matrix ϕ -Agree and is bound as the predicate variable, itself ultimately binding the gap; under the assumption that the whole OP clause is the argument of *be easy*, we get (32)a. Alternatively, if the proposal in section 4 is correct and the gap is identified by pure \bar{A} -Agree of C_{OP} , C_{OP} is the goal of matrix ϕ -Agree and the ϕ -features of the gap are directly transferred to the matrix T, again determining which variable the TM subject λ -binds, (32)b.

¹¹ Unless the experiencer is base-generated as an anaphor, but then it presumably cannot control PRO.

¹² If OP is just \bar{A} -Agree as in section 4, the definiteness effect must be understood correspondingly as including Agree-valued definiteness (or perhaps rather person, Chomsky 2000:149n90, 93) features.

(32)

- a. **The books** $\lambda_{x_1}[[x_1\lambda_{x_2}[\text{PRO to read } x_2]] \text{ is easy}]$
- b. **The books** $\lambda_{x_1}[[\text{PRO to read } x_1] \text{ is easy}]$

Thus, the syntax and semantics of movement and copy-raising sketched in the last section succeeds in accounting for the subject-gap correlation and linking problems. This seems a considerable step forward, given that the tools are independently necessary to implement the Compositional Theory of Movement in the first place. A tiny part of the selection problem is accounted for as well: TM triggers must be of the raising type, without ϕ -accessible arguments.

3.3 Base-generation of the TM subject and its consequences

A-movement and copy-raising differ in that the former involves copies which are deleted by the copy-deletion algorithm Δ and the latter overt pronouns. This difference correlates with the fact that a CP boundary is crossed by ϕ -Agree in copy-raising but not in raising. Rezac 2004a:160ff., 2004b argues that the CP boundary blocks Δ , though for reasons derivable from other principles. Condition C, which Δ normally obviates, determines that copy-raising can use pronouns only.

(33)

- a. Kate₁ seems like [she₁/*the girl₁/*~~Kate~~₁ left] *copy-raising*
- b. Kate₇ seems [~~Kate~~₇/*she₁/*the girl₁ to have left] *movement*

This difference gives rise to significant interpretive differences. Thematically the non-thematic DP in both movement and CR is interpreted as λ -binding the the goal identified by \bar{A} -Agree. However, a pronoun is an *e*-type element, and thus non-*e*-type, quantificational, properties of its λ -binder cannot "reconstruct" into it. A copy on the other hand is a full representation, and the higher copy may be deleted, leaving quantificational properties to be interpreted in the lower copy (Sauerland 1998, 2004).

In TM, Browning 1989 takes OP to be *pro* moved from the gap to an \bar{A} -position, while Chomsky 1982, Cinque 1990 take OP to be an in-situ *pro* bound from the top of the OP clause.¹³

In either case, the OP and/or the gap are *e*-type objects. This may be derivable. As discussed for example (30), the TM subject cannot λ -bind a full DP in the next lower [Spec, CP] because ϕ -Agree is blocked by the $C_\phi P$ boundary, which forces insertion of the *it* expletive. A full copy lower within the OP clause cannot be Δ -deleted because Δ does not span CP-boundaries. If it thus remains overt however (and the potential goal of pure \bar{A} -Agree by C_{OP} as proposed in section 4), Condition C obtains between it and the TM subject.¹⁴ This leaves only a pronoun the DP which may be λ -bound by the TM subject, which in order to be so must enter into an \bar{A} -relation with C_{OP} as discussed in the preceding section.

¹³ It is an open question whether OP in (i) should be subject to Condition B triggered by the TM subject. Watanabe's 2000 treatment of Switch Reference and Borer's 1989 treatment of control imply that interpretable ϕ -features in the C-system of a clause are subject to Conditions A and B with respect to arguments of the next higher clause (though Landau's 2000 development of Borer 1989 does not). If Condition B should apply, OP cannot be *pro*; the analysis of section 4 here where OP is just \bar{A} -Agree by C_{OP} with *pro* in the TM gap would be supported.

(i) Kate_i is easy [OP_i to like *e*_i]

¹⁴ Depending on whether Condition C applies here, see section 4.3.4

This yields interpretive consequences: although the TM subject λ -binds the OP/gap, it should not be able to reconstruct into it for quantificational properties.¹⁵ Indeed, Postal 1971, 1974:224, 356, Lasnik and Fiengo 1974:544ff., Epstein 1990:651ff., Cinque 1990:194n39, Rezac 2004a:189f. observe that reconstruction for scope or quantifier binding is impossible for the TM subject anywhere below its surface position, not just within the OP clause, but also below the TM trigger and its *for*-PP experiencer. In (34) for example, the TM subject must take scope above the propositional argument of the TM trigger, not in it: what is *easy* in (34)a is *talking to x* (e.g. at a party), each *x* a single person (though there are many of them), which is quite different from *talking to many people* (at a time) being easy.

(34) TM cannot scope below TM trigger

- a. Many people are easy to talk to *e*. (Epstein 1990:651)
=There are many people *x*, such that it is easy to talk to *x*. (Epstein 1990:652)
≠It is easy to talk to a large group of people. (Epstein 1990:652)
- b. Nothing is hard for Melvin to lift *e*. (Postal 1974:356)
- c. Few girls would be difficult for Jim to talk to *e*. (Postal 1974:224)

(35) TM subject cannot take scope in the OP clause

- a. Many patients are difficult to introduce to each doctor. (*each > many) (based on Cinque 1990:194n39)
- b. It is difficult to introduce many patients to each doctor. (each > many o.k.)

(36) TM subject cannot reconstruct for variable binding below the experiencer

- a. Her_i work is hard to convince Judy_i/[every woman in the group]_{*i} to share.
- b. The lyrics that she_{*j} wrote were easy for [every woman in the group]_j [to sing].
(Rezac 2004a:190)

This is quite parallel to the subject in copy-raising which has unambiguous scope above the matrix verb, as in (37); it is the absence of reconstruction that gives rise to the noted oddity of (37)a which can only mean (37)b, not (37)c, the latter being the salient reading of (37)d.

(37)

- a. No one seems like he is here. *seem > no one, no one > seem
- b. =No person is such that it seems like he is here.
- c. ≠It seems that no one is here. (o.k. if there are no people present)
- d. No one seems to be here. (o.k. on both readings) seem > no one, no one > seem

¹⁵ In addition, it opens a window on a long-standing problem: the TM gap may not be an adjunct (i), (ii), which is anomalous even in comparison to other constructions with obligatorily null operators, (iii) (Browning 1989:118ff., Cinque 1990:104). If the gap is an *e*-type pronoun, it should not be interpretable as an adjunct which is of type $\langle e, t \rangle$ or higher. The tenor of this solution is the same as Cinque's 1990:115ff. explanation why adjuncts cannot escape out of islands; it leads us to expect a correlation between which adjuncts can(not) be TM subjects and which can(not) escape weak islands or link to resumptives, which shows variation (McCloskey 2002, Postal 1998, Cinque 1990).

- (i) *Tuesday/*quietly is easy [to meet *e*].
- (ii) *?That way may be hard [to fix the car *e*].
- (iii) Kate has an odd way [to fix the car *e*].

The evidence of these paradigms is very specific: the non-thematic DP in both TM and copy-raising λ -binds a pronoun, not a copy, anywhere below the matrix predicate. Copy-raising wears this on its sleeve; for TM it follows if the OP/gap must be pronominal, as discussed.

The syntax of TM proposed in the preceding two sections leads to an independent prediction about reconstruction. The TM subject is base-generated directly in the [Spec, TP] of the TM trigger, as sister to the Agreeing T which determines the DP it λ -binds. There should therefore be no reconstruction position within T', unlike what is expected on Browning's 1989:chapter 2 proposal that the TM subject is base-generated sister to the maximal projection of the TM trigger. This prediction can be confirmed. Heycock 1994:262 observes that TM constructions seem like individual-level predication. This fits in with Lasnik and Fiengo's 1994:544ff. development of Postal's 1971 observation that TM subjects must be generic rather than existential if indefinite; this is a property of individual-level predication. Subjects in copy-raising behave like this as well (Heycock 1994:293-4).

(38) TM indefinite subjects are only generic

- a. Beavers are/a beaver is hard to kill. (Lasnik and Fiengo 1974:546; generic only)
- b. It was a pleasure to each a bunch of bananas; there are their skins. (Lasnik and Fiengo 1974:546)
- c. *A bunch of bananas was a pleasure to eat; there are their skins. (Lasnik and Fiengo 1974:546)

(39) Individual level predication subjects are only generic

- a. *A building/someone was tall. (Lasnik and Fiengo 1974:545)
- b. Beavers are fat (*they're over there). (Lasnik and Fiengo 1974:546)

(40) Copy-raising subjects are only generic

- a. #Snow sounds/seems like it's falling on the mountain. [generic reading made salient]
- b. Snow seems to be falling on the mountain. [existential reading possible]
- c. Snow sounds like it must be a strange thing: hexagonal ice crystals falling out of the sky? [generic reading made salient] (Heycock 1994:293-4)

Kratzer 1995 and Diesing 1992:chapter 2 argue that the availability of an existential reading for bare nouns depends on binding by the existential closure operator of clausal partition theories. This operator is located somewhere between T' and VP. The absence of an existential reading for individual level predicates is taken as evidence that their subjects, unlike those of stage-level predicates, are base-generated in [Spec, TP]. The result transfers to TM and copy-raising: there is no copy of the matrix subject where it could be bound by the generic operator, as there is in movement. Kratzer and Diesing also argue that base-generating the subject in [Spec, TP] rather than lower is what gives rise to the other properties of individual level predication. The latter, as discussed at the end of section 2, seem to be the source of various restrictions on the OP-clause, which thus receive a principled explanation.

3.4 Summary

The mechanics of the syntax and interpretation of non-thematic positions reviewed in the previous two sections unify movement, copy-raising. All three constructions instantiate the

sequencing of ϕ -Agree by T and Merge of non-thematic [Spec, TP] which λ -binds the goal of T's Agree. Their differences derive from copy deletion, binding theory, and the options available for externalizing the ϕ -features of a CP-internal DP to make the accessible for higher ϕ -Agree. The mechanism resolves the central problem of *tough*-movement: the correlation and link between the TM subject and the OP clause's gap. Copy-raising and TM in particular come out as virtually identical instantiations of the mechanics, the difference being that an \bar{A} -relation is required in the embedded CP to make a position in it accessible to higher ϕ -Agree, while the CPs of copy-raising make accessible their [Spec, TP]/T directly.

The use of ϕ -agreement for the transmission of an index is partly due to Browning 1989:chapter 2. For her, predication of which λ -binding is an implementation interprets subjects in predicate-internal open positions identified by agreement. Agreement is shared only in the spec-head and head-projection configurations. This forces a strong phrase-structural locality between the subject and the predicate as Williams 1980 argued, ruling out e.g. *a man_i it is illegal PRO_i to fix the sink*. Agreement also identifies the null operator of OP-clauses on the assumption that it is *pro*, ruling out **It is easy PRO_{arb} to bother*, implementing Chomsky's 1986b strong binding. TM has the structure in (41)a; another type of configuration permitted is for PRO itself to be the open variable as in subject reduced relatives (41)b.

- (41)
- a. Kate₁ is t_1 [_{AP} OP₁ easy_A [_{CP} PRO_{arb} to please t_1]]
agreement
- b. a girl₁ [_{IP} PRO₁ to_I fix the sink]
agreement

In my approach ϕ -Agree may identify a predicate variable at a distance, as in (42). This is required for TM since the OP/gap chain terminates in the OP-clause (section 2), while the TM subject is base-generated "at a distance" in the TM trigger's [Spec, TP] (section 3.3). Strict subject-predicate locality is kept encoded in the formulation of Predicate Abstraction, and agreement continues to identify predicate variables. Browning's ungrammatical examples are properly blocked by the locality of ϕ -Agree which cannot cross *it* in **a man it is illegal PRO to fix the sink*. The consequences of the strong binding requirement are captured more directly; the TM subject is determined by whatever ϕ -set is represented at the top of the TM trigger's clausal complement, whether an OP-gap structure giving a TM subject that λ -binds the OP/gap or C $_{\phi}$ giving *it*.

- (42) Kate₁ has_T been [_{AP} [_{AP} easy for Nolwenn_i] [_{CP} pro_I C [_{IP} PRO_i to please t_1]]]
Agree

4 OP-movement as \bar{A} -Agree

4.1 \bar{A} -Agree vs. \bar{A} -movement

In discussing ϕ -Agree, Chomsky 2000:124, 126 takes it as an operation that does not represent the interpretable features of the goal at the target, as in Chomsky 1995:272ff., but rather as the valuation uninterpretable features which delete at some later point.¹⁶ Agree therefore does not create any permanent representation of the goal at the position of the target; dependencies are

¹⁶ Immediately or at the phase-level, Chomsky 2000:131, the latter option perhaps being returned if there is a more abstract notion of a phase correlating with Agree, Chomsky 2004.

formed "at a distance" with no phrase-structural modification. The reasons lie in the inertness of ϕ -agreement for all syntactic and semantic purposes such as binding, scope, or control, argued for by Lasnik 1999:chapters 6, 8 from paradigms such as (43), a conclusion extended to Icelandic by Jónsson 1996:209 and to Tsez by Potsdam and Polinsky 2001:620. For discussions of this change and its ramifications, and the arguments that bear on it, see Watanabe 2000, Boeckx 2002, Lopez, 2002, Lasnik 2002, Rezac 2004a:chapter 4. I adopt it forthwith.

(43)

- a. Several runners seem to each other t_i to be likely to win the race.
- b. *There seem to each other to be several runners likely to win the race.

Chomsky 2000:109, 128, 149n91, 92 suggests that the \bar{A} -system uses the same basic mechanism as the A-system: for the *wh*-system, we have Agree by a [Q] probe with a matching interpretable [Q] and an activation [wh] feature on the goal, with the relativized minimality effect of \bar{A} -interveners arising as a defective intervention effect of the interpretable [Q] features on *wh*-phrases. Adger and Ramchand (forthcoming) propose that as for ϕ -Agree there are constructions which involve pure \bar{A} -Agree with no corresponding movement. This is what I will independently suggest for the OP-gap relation, seeing how the empirical evidence stacks up in view of such a pure Agree analysis.

For a large set of \bar{A} -relations such as those involving *wh* or focus, pure Agree is precluded. For example, whether moved or in-situ on the surface, *wh*-words must scope over the proposition which becomes a question: see Romero 1997, Hagstrom 1998, and Rullmann and Beck 1998 for some recent analyses. On the opposite end of the scale stand relative clauses, where all that is ultimately needed for the relative clause to be interpreted with its head λ -binding the gap is a λ -operator at its top binding the gap in it, and that is inserted by Predicate Abstraction at LF. Resumptive relatives in particular need not use any syntactic mechanism at all to establish dependencies: this is the case for Irish resumptive relatives on the analysis of McCloskey 2002 and for English *such that* relatives on the Montagovian analysis (Dowty et al. 1985:211ff., Heim and Kratzer 1998:106ff.).

In the following sections, I will see what the OP-gap relation in TM OP clauses looks like from this perspective. The idea to keep in mind is that it might be analyzed simply as follows: (i) the C_{OP} at the top of the OP-clause has an \bar{A} -probe, whose \bar{A} -Agree is responsible for the set of \bar{A} -properties classically diagnosing OP-movement; (ii) this \bar{A} -Agree alone transmits the index feature identifying the goal to λ -bind in the OP clause; (iii) the goal is a pronoun (see section 3.3) with a feature that makes it an \bar{A} -goal; (iv) the goal itself stays in-situ, with no representation at the top of the OP clause. Together, this makes three predictions about OP clauses: first, there is a C_{OP} -gap relationship stemming from \bar{A} -Agree and thus with its properties, as conclude Chomsky 1977, 1981, 1986ab and others; second, the gap behaves as an undisplaced *pro* (albeit with an \bar{A} -feature), the analysis of Chomsky 1982 greatly extended and elaborated in Cinque 1990; third, there is no interpretable representation of the gap at the top of the OP clause. I will show that various quirks in the behavior of OP clauses suggest that it fits this description, unlike other \bar{A} -structures which do not have overt operators either like infinitival relatives. This addresses the OP-gap problem.

Before proceeding, it must be clarified how \bar{A} -Agree interacts with a system developed in section 3. It suffices to assume that C_{OP} has an unvalued [ix] feature, beside whatever other features it may have. The *Free Rider Principle* proposed in Chomsky 1995:265f., 268-70, 275,

which ensures that the Agree by any probe on a head/label such as C/C' values all of its features that it can, is somewhat stronger a requirement. At any rate, there is independent evidence that \bar{A} -Agree entails ϕ -Agree in languages. In Kilega (Bantu, Congo; Kinyalolo 1991), the verb which raises to C^0/Fin^0 registers two separate sets of ϕ -features: one with the subject, and one with a *wh*-phrase, as in (44)a. Similar evidence is to be found in languages like Passamaquoddy (Algonquian, Bruening 2001), where \bar{A} -movement can trigger a special ϕ -agreement morphology on every verb it crosses, distinct from and independent of their regular ϕ -Agree (Bruening 2001:206ff.). Interestingly, this ϕ -morphology tracks DPs which can never control regular ϕ -Agree, like the secondary objects of ditransitives (Bruening 2001:207 and note 6); in (44)b *ac* is the regular ϕ -Agree of *v* controlled by the primary object, and *ihi* the ϕ -morphology which tracks specifically \bar{A} -movement across a verb, here the secondary object.

(44)

- a. Bikí bí-b-á-kás-íl-é *pro* mwámi mu-mwílo?
 VIII.what VIII.CA-II.SA-ASP-give-ASP-FV II.they I.chief XVIII-III.village
 'What did they (those women) give the chief?' (Carstens 2003:408)
- b. Nihit nit akom₁ *pro*₂ kisi-mil-ac₂-ihí₁.
 these.OBV.PL that snowshoe.OBV.PL 3.SG.F PERF-give-3.CONJ-PART.OBV.PL
 'These are the snowshoes that he gave her.' (Bruening 2001:207)

4.2 \bar{A} -relations in the OP clause

There is substantial evidence that the gap in the OP clause enters into the \bar{A} -system.¹⁷ First, the gap is subject to all islandhood conditions such as the opacity of adjuncts, as illustrated in Chomsky 1977 and Browning 1989; of particular relevance here are *wh*-islands in (45).¹⁸

(45) ??John is fun for us to find out how to annoy *e*. (Browning 1989:9n15)

Within the limits thus imposed, the OP-gap relationship is unbounded: the gap may be indefinitely embedded across any number of clausal boundaries and A-positions. This is an idealization in many respects; parameters of degradation are the depth of embedding, intervening finiteness, and subject/object asymmetries, the last of which I return to in section 4.3.2. Keeping to object gaps, we have:

(46) Embedded gaps in sequences of infinitivals

- a. The books are easy/difficult to convince people to read *e*. (Chomsky 1981:310, 314)
 b. These papers were easy for me to get someone to sign *e*. (Heycock 1994:257)
 c. Kim would be difficult to persuade Robin to reason with *e* (Hukari and Levine 1987)

(47) Gaps across tensed clause boundaries

¹⁷ There is no weak cross-over for a pronoun contained in the OP-gap chain. Lasnik and Stowell 1991 treat this by taking OP to quantify over a singleton set; this makes sense semantically for example for non-restrictive relative clauses, which cannot modify true quantifiers, but not for TM, as in (i). However, such examples fall into place directly simply because the offending pronoun can be λ -bound by the matrix subject itself, cf. (2).

(i) No one_{1,2} is easy [*e*₁ to get his₂ foes [to like *e*₁].

¹⁸ Not only can the TM gap not be in an island, it also cannot pied-pipe the island is possible with overt operators. Chomsky 2001:23-4 argues that α can only pied-pipe if α has phonological features.

- a. *John is easy to demonstrate that Bill killed (him). (Lasnik and Fiengo 1974:551)
- b. This book is difficult to convince people/anyone that they ought to read *e*. (Chomsky 1981:314).
- c. ?This boulder would be easy for me to claim that I had lifted *e*. (Heycock 1994:260)
- d. Mary is tough for me to believe that John would ever marry *e*. (Kaplan and Bresnan 1982).
- e. %Mary is hard for me to believe Leslie kissed *e*. (Dalrymple and King 2000:16)
- f. That kind of mistake is hard to realize you're making *e*. (Calcagno 1999)

Parasitic gaps are licensed (48), Chomsky 1982, 1986ab; this is a topic I will not discuss because I don't know how parasitic gaps are licensed (see Browning 1989:chapter 3, Cinque 1990:chapter 3, Nissenbaum 2001, and the articles in Culicover and Postal 2001).

(48) John is easy to talk to *e* without offending *pg*.

The OP clause is a barrier to further extraction out of it, as expected if headed by the top of an \bar{A} -chain. There are superficial counter-examples such as (49)a, which all involve D-linked *wh*-phrases whose gap must moreover be situated in a right-peripheral position (Chomsky 1981:311) and not embedded deeper within the OP clause (Jacobson 2000). Otherwise, extraction from the OP clause is impossible, (50).

(49)

- a. Which violins₂ are the sonatas₁ easy to play *e*₁ on *e*₂? (Chomsky 1981:310)
- b. *Which violin₂ is that sonata₁ hard to imagine (anyone) playing *e*₁ on *e*₂ / wanting to play *e*₁ on *e*₂? (Jacobson 2000)

(50)

- a. *How intelligent₂ is John₁ easy to think of / regard *e*₁ as *e*₂?
- b. How intelligent₁ is it easy to think of / regard John as *t*₁
- c. ?John₁ is easy to think of / regard *e*₁ as very intelligent.
(cf. Chomsky 1981:311)

The TM-gap chain must be contained within the *wh*-gap chain, obeying Pesetsky's 1982 Path Containment Condition on interacting \bar{A} -dependencies:

(51)

- a. *Which sonatas₂ are the violins₁ easy to play *e*₂ on *e*₁? (Chomsky 1981:310)
- b. *Which people₂ are the books₁ easy to convince *e*₂ to read *e*₁? (Chomsky 1981:310)

This degradation is very sharp, more so than in the corresponding crossing overt *wh*-movement chains. There is quite a simple explanation available within theories that start out from Rizzi's 1990 relativized minimality: if the OP-gap and the *wh*-gap are both equally attractable by the \bar{A} -probe at the top of the OP clause, only the closer gap can be taken. The latter fact may be part of a much larger pattern; Rizzi 2004 observes that different types of A-movements such as *wh* and focus movement are frozen for each other, which would fall out if there was a unitary \bar{A} -probe, with criterial positions differentiated by the interpretable features of the target (op.cit., n. 2). If this is the OP-gap, all is well, and the data-set in (49) results. If this is

an overt *wh*-phrase, the derivation does not converge because a number of mismatches will arise: the *wh*-phrase will not have its [wh] feature deleted; it cannot move to the top of the OP clause which does not tolerate overt material (4.4); the matrix C will not find an active *wh*-phrase as a goal; etc. In different terms, the ban on crossing paths ends up as a defective intervention effect of the *wh*-phrase on the C_{OP}-gap relation.

A final piece of evidence for an \bar{A} -relation between OP and the gap is the curious restriction that the highest subject of the OP clause is not accessible to the OP-gap relation at all. This contrasts with both regular *wh*-movement and with subject-gap infinitival relatives (Williams 1980, Browning 1989:25f., Bhatt 1999), (52). The issue is not whether PRO can enter into an \bar{A} -chain with C_{OP}, but what rules out a regular forming a short OP-gap chain.

(52)

- a. *Kate is easy *e* to win the race.
- b. the woman *e* to win the race.
- c. the woman that *e* won the race.

I propose to identify the problem as the *Highest Subject Restriction* known from work on resumptive constructions, which blocks a resumptive from being the closest subject position to the resumptive C; see Borer 1984, McCloskey 1990 for classical discussion, and Richards 1997:147ff., Boeckx 2003:83ff. for recent formulations. Apparent \bar{A} -movement is also subject to a similar *Anti-Agreement Effect* in some languages with strong agreement, Ouhalla 1993, which Rezac 2004a:245ff. argues arises because strong agreement in these languages is a base-generated expletive sharing ϕ -features with the extracting subject, and in this sense behave like a resumptive. The various proposals differ as to the source of the effect, though a promising line of inquiry is the attempt to derive it from economy in the coding of dependencies, Boeckx op.cit., which could square with the older idea that it is a Condition B type of effect if the latter receives such an explanation as in Reuland 2001. At this point (52)a is just another \bar{A} -property shown by the OP-gap relation.

It's time now to take stock and see how this all squares with various approaches to the OP-gap relation. There is \bar{A} -Agree constrained by feature-relativized locality between C_{OP} and the gap. This is as predicted by either the OP-movement or the pure \bar{A} -Agree approach; treating the gap as simple *pro* that does not enter into the \bar{A} -system requires a different set of assumptions, developed in Cinque 1990:chapter 3. The fact that the OP-clause is a barrier to further extraction also follows on both approaches. If there is OP-movement the displaced OP is the barrier. If there is pure \bar{A} -Agree by C_{OP} with the gap, C_{OP} is part of the phase-edge of the phase it defines if it defines one, and a phase-edge must not be affected by deletion or spell-out until the next higher phase-head has accessed it (Chomsky 2000, 2001), so the (valued) \bar{A} -probe of C_{OP} will remain an intervener at least up to that point (cf. Manzini 1998). I will now go through the various bits of OP-gap behavior that seem to bear one way or another on distinguishing the pure \bar{A} -Agree and the OP \bar{A} -movement approaches, generally supporting the former.¹⁹

¹⁹ A problem for both approaches might seem to be French participle agreement (I am grateful to Mélanie Jouisseau, p.c., for all the French data that follow). In French, secondary predicates must agree in ϕ -features with the DP they are predicated of, while participles in the perfect active only agree with their object, and then optionally, if it undergoes \bar{A} -movement or cliticization (Kayne 1989). Cinque 1990:114 notes (for Italian) that an adjective in the OP-clause predicated of the gap λ -bound by the TM subject must agree with it, (ia), (ib); this means that the gap must represent the ϕ -features of the TM subject that λ -binds it. Miller and Sag 1997:626 point out that the participle of the perfect active cannot agree with the TM subject it λ -binds the participle's object, (ic); this indicates that the

4.3 OP-movement as \bar{A} -Agree

4.3.1 *TM gaps in DOCs*

Lasnik and Fiengo 1974 point out that the TM gap cannot be either of the two objects in a double object construction DOC; in their judgment (p. 550) indirect object IO extraction leads to severe ungrammaticality, direct object DO extraction to a somewhat weaker one (cf. Cinque 1990:108).

(53) TM and DOCs

- a. John was fun/tough/impossible/a bitch to give criticism *e*.
- b. *John was fun/tough/impossible/a bitch to give *e* criticism.
- c. Criticism was fun/tough/impossible to give *e* to John.
- d. *?Criticism was fun/tough/impossible/a bitch to give John *e*.
(Lasnik and Fiengo 1974:548, 550)

IOs in DOCs show a general resistance to entering the \bar{A} -system, observed by Fillmore 1965 subject to various analyses reviewed in Baker 1988:294ff. However, the ban on DO as the OP-gap is more parochial and intriguing.²⁰ Cinque 1990:122-4 comes up with an ingenious explanation that I would adopt if possible. It supports his analysis of the TM gap as base-generated *pro*. He notes that "dative constructions are characterized by a [...] well-known restriction: their second object can be a pronominal only very marginally (if at all)" (p. 122), (54)a. Pronominal DOs improve if the IO is light (54)b, a fact that Oehrle 1976 describes more generally as the requirement that the DO be more prominent than the IO on the scale *clitics* < *me/it* < *us/you* / *other 3rd person pronouns* < *everything else* (p. 169). Cinque observes if the IO is a pronoun, DO TM gaps are impeccable (54)c which goes in the expected direction.²¹

gap does not undergo \bar{A} -movement or cliticization.

- (i) a. Ces machines sont faciles a rendre pretes [pret]/*pret [pre] a la vente.
These machines(F.PL.) are easy to make ready(F.PL/*M.SG) for sale.
- b. Cette machine est facile a rendre prete [pret]/*pret [pre] a la vente.
This machine(F.SG) is easy to make ready(F.SG/*M.SG) for sale
- c. Ce sont des fautes dangereuses à avoir commis [kɔmi]/*commises [kɔmiz] dans sa jeunesse.
These faults(F.PL) are dangerous to have committed(M.SG/*F.PL) in one's youth.

However, this is too facile. French lacks the English kind of TM entirely, because it fails the major \bar{A} diagnostics: parasitic gaps, though they exist, are not licensed (Tellier 2001:342); intervening A-positions cannot be skipped at all; and the gap cannot be further embedded. The French construction seems to be a kind of A-movement under restructuring (cf. Kayne 1975:340n76, Cinque 2003). It's worth having a quick look aside at other constructions in French that have received a null operator analysis (see section 4.4). It turns out they all license participle agreement (ii); this is expected both on theories where the gap undergoes \bar{A} -movement, and where it is *pro* and thus presumably subject to cliticization.

- (ii) a. Ce sont de fautes faciles a avoir commis(es) *e*. (Infinitival relative)
These are faults easy to have committed.
- b. Ces fautes sont trop facile a avoir commis(es) *e*. (Degree clause).
These faults are too easy to have committed.
- b. Ce sont les fautes que je comprends *t* sans avoir commis(es) *pg*. (Parasitic gaps)
These are the faults that I understand without having committed.

²⁰ Though see Nakamura 1997 for discussion of the ban on DO-extraction in a different class of languages. It may fall under the explanation that follows.

²¹ The fact that they are impeccable rather than less degraded as the corresponding DO pronouns are, he thinks to

(54) DO/IO weight interactions.

- a. *I gave that man it/them.
- b. ??I gave 'im THEM.
- c. Books are not easy to give him *e*.
(Cinque 1990:123)

If Cinque has identified the correct pattern, then the TM gap is a (null) pronoun. It is not a trace, which is not subject to Oehrle's constraint.²² This supports \bar{A} -Agree over \bar{A} -movement.

4.3.2 Subject/object asymmetries in TM gaps

The pronominal behavior of the gap might be recruited to explain the subject/object asymmetries it shows. Extraction from embedded subject positions in *wh*-movement is well-formed: the subject of an ECM infinitive, a tensed bridge verb complement lacking a complementizer, and small clause subject. These are subject to varying degrees of degradation in TM. Extraction of theta-selected left branches is not nearly as degraded:

(55)

- a. Smith was easy for Jones to force *e* to recover.
- b. *Smith was easy for Jones to expect *e* to recover.
(Chomsky 1973:254n33)

The data for extraction from embedded subject and object positions in the entire group involving non-overt operators in infinitival clauses is subtle; see Browning 1989:131-5. To summarize her conclusions for TM gaps: both subject and object gaps are degraded (though this needs to be set against a number of quite good object gaps, ex. (46)), but subject gaps more so; small clause complement subjects are least degraded among subject gaps; semantics of the embedded verb plays a role (cf. also Dalrymple and King 2000:15, here (56)d vs. (56)e); intervening tensed clauses degrades grammaticality (cf. ex. (47)); there is amelioration if the clause hosting the subject gap has *be* or a modal.

(56)

- a. ?Mary was difficult for anyone to consider *e* arrogant. (Browning 1989:132)
- b. *Mary was difficult for Jane to believe *e* to understand the problem. (Browning 1989:132)
- c. ??This problem was difficult for me to believe Mary to understand *e*. (Browning 1989:132)
- d. *Smith was easy for Jones to expect *e* to recover. (Dalrymple and King 2000:15, from Berman 1973)
- e. This analysis was hard for us to prove *e* to be correct. (Dalrymple and King 2000:15, from Nanni 1978, attributed to Barbara Partee).

Browning 1989:135ff. and Cinque 1990:105-6, 119-121 note that similar subject/object asymmetries also show up in \bar{A} -gaps in weak islands, (57). Since for Cinque island-internal gaps

follow from the fact that *pro* is between a 3rd person pronoun and a *wh*-bound variable/trace.

²² The trace of a topicalized pronoun seems degraded, ?(?)*Them I would never give Kate e*, though the gap here may itself be a null pronoun, Cinque 1990, Postal 1998.

are *pro*, he takes TM gaps to be *pro* as well. However, there is not at hand in this case a neat explanation as there is with DOCs as to what degrades subject gaps; pronouns are fine in the subject positions concerned.²³

(57)

- a. ??Which guy did John wonder when to expect *e* to show up? (Browning 1985:135)
- b. ?Which gift did John wonder when to expect PRO to receive *e*? (Browning 1989:135)

It is worth mentioning here another classical puzzle involving subject gaps: the TM gap is strongly ungrammatical if it is the subject in the Romance ECM construction (Rizzi 1982, Kayne 1981) or triggers the *qui* complementizer in French (cf. Rizzi 1990:56ff., 97, and references): see Browning 1989:138ff., Cinque 1990:107ff. The same subject positions also cannot host gaps in weak islands, and again Cinque suggests reducing both phenomena to conditions on *pro*.

4.3.3 Montalbetti's Overt Pronoun Constraint

Montalbetti's 1984 Over Pronoun Constraint OPC prevents a quantifier or the trace of its \bar{A} -extraction from λ -binding an overt pronoun if *pro* is available; such a bound *pro* may however itself bind an overt pronoun.

(58)

- a. Muchos estudiantes_i piensan que ellos_{*i/j}/*pro*_{i/j} son inteligentes.
many students think-PL that they are intelligent
Many students think that they are intelligent. (Montalbetti 1984:82)
- b. A quienes_i Pedro convenció *t*_i de que ellos_{*i/j} son tontos?
A who-PL Pedro convinced of that they are foolish
Who did Pedro convince that they are foolish? (Montalbetti 1984:98)
- c. Muchos estudiantes_i dijeron que *pro*_i piensan que ellos_i son inteligentes.
many students said that think-PL that they are intelligent
Many students said that they think they are intelligent. (Montalbetti 1984:90)
- d. A quienes_i Pedro convenció de que *pro*_i digan que ellos_i son tontos?
A who-PL Pedro convinced of that say-PL that they are foolish
Who did Pedro convince to say that they are foolish? (Montalbetti 1984:101)

Montalbetti (1984:157f.) notes that TM in constructions, the gap behaves like a bound *pro* in being able to license a farther pronoun, rather than like the trace of \bar{A} -extraction which could not.

- (59) Muchos estudiantes_i son fáciles de convencer *e*_i de que ellos_i viajen a Lima.
many students are easy of convince of that they travel-PL to Lima
Many students are easy to convince to travel to Lima. (Montalbetti 1984:157)

²³ A more serious objection would arise if subject/object asymmetries of this type were to arise in cases of genuine \bar{A} -movement that cannot be analyzed as resorting to *pro*. However, although subject/object asymmetries do indeed arise here occasionally, for example in middle-field quantifier movement in Icelandic, they group ECM subjects with objects as good gaps against finite subjects as bad gaps (themselves good gaps in that language for topicalization): see Svenonius 2000.

As Cinque 1990:127ff. observes, this is an argument in favor of treating the OP-gap as a null pronoun rather than a trace; here it supports the \bar{A} -Agree over the \bar{A} -movement approach.²⁴

4.3.4 Condition C and Strong Cross-Over

There is one solid piece of evidence that the gap does not behave as a regular pronoun: the OP-gap chain is subject to strong cross-over if it crosses a pronoun, (60)a.²⁵

(60)

- a. John_j would be difficult PRO_{arb} to convince him_i/*himself_j that I admire *t_j*.
- b. John_j is easy OP_j PRO_{arb} to spot *t_j* in a crowd.
- c. *John_i is possible [_{CP} *t_i* PRO to like *t_i*]

This depends on what strong cross-over is. Chomsky 1981:203ff. treats it as Condition C applied to the \bar{A} -traces, which thus behave as R-expressions. There is tension between TM and using Condition C to rule out improper movement, leading to the standard formulation where Condition C requires α to be free in the domain of the head of its maximal chain, defined as the history of the movement of α (Chomsky 1981:193-204, 1986b:113-4, Brody 1993:8ff.). Thus, while *him* in (60)a triggers Condition C for *t*, *John* does not trigger it for *t* in (60)b because the chain of *t* ends in OP (or the corresponding \bar{A} -Agree), but because *possible* does not select an OP-clause the only representation of (60)c is with *John* binding *t_i* within the latter's maximal chain. Higginbotham 1983, Postal 1997, 2002:chapter 7 presents significant challenges to treating strong crossover as Condition C, leaving the phenomenon without a clear explanation. Here it suffices to note that even approaching it as Condition C in (60)a, the fact that the null pronoun in the gap bears an \bar{A} -feature may subject it to the Condition like an R-expression.

4.4 The distribution of pure \bar{A} -Agree

Although there is every reason to be cautious, there is evidence that the TM gap behaves like an undisplaced null pronoun with an \bar{A} -feature, *pro_A* rather than an \bar{A} -trace/copy. The location of the gap is constrained by the locality of \bar{A} -Agree, so this pronoun enters into pure \bar{A} -Agree with C_{OP}, without any displacement.

Presumably, the null \bar{A} -pronoun requires licensing by Agree for its features including the one that makes it visible to an \bar{A} -probe; conversely, it will not satisfy the requirements of just any C with an \bar{A} -probe like C_Q. This restricts it to clauses headed by what I have been calling C_{OP}, the C that heads OP-clauses in TM. C_{OP} considers *pro_A* a match and Agree between the two satisfies the requirements of both. Following Brody 1993:8-9, I have been assuming that C_{OP} like C_Q for example can be selected for, accounting for why *impossible* but not (*not*) *possible* is a TM trigger; in this particular case I can't do any better. At this point several interrelated questions arise: (i) are there non-arbitrary restrictions on the selection of C_{OP}, namely is it restricted to TM triggers, and if so is there a principled reason; (ii) is it the case that C_{OP} must enter into pure \bar{A} -Agree, not being able to project [Spec, C_{OP}P]; (iii) why is there no overt analogue of *pro_A*, like relative pronouns have both overt and null forms. These are difficult questions; just to get at

²⁴ However, Spanish TMs may be more like French than English; see note 19.

²⁵ The data in (60)a are somewhat murky; certainly *him=j* is bad, but *him=i* is not very good either, and it may be impossible to construct a more contrastive example. "Reanalysis" would lead us to expect *himself_j*, also bad.

them, I will dismiss (iii) by hypothesizing it reduces to (ii), to which I will suggest below the answer is affirmative. If C_{OP} cannot license a specifier, an overt equivalent of $pro_{\bar{A}}$ arguably fails to be licensed because the Case-like \bar{A} -feature that makes it active for an \bar{A} -probe would then require either movement to [Spec, CP] or some default mechanism, and neither is available. This could be quite wrong, but the historical antecedents will make sense in the next two paragraphs.

Consider the general class of "On *wh* constructions" in English, setting aside those which obligatorily move the goal (questions and topicalizations). Among the rest, there is a split among those whose topmost clause must be tensed, namely tensed relatives, clefts, and comparatives, and those where it must be infinitival, namely infinitival relatives, TM OP clauses, degree clauses, purpose clauses; parasitic gaps are possible with both infinitival and tensed clauses (see Culicover 2001). Browning 1989:127ff. views the split as significant, because it is only the tensed group, ignoring parasitic gaps, which shows relative insensitivity to depth of embedding, intervening tensed clauses, subject/object asymmetries (setting aside *that*-trace) and which is compatible with gaps in the Romance ECM and French *qui* contexts. Interestingly, the tensed/infinitival contrast partially correlates with another: the availability of pied-piping the \bar{A} -goal of the relevant construction. This is impossible in the infinitival group (with one exception, below), but possible with deletion up to recoverability (Chomsky and Lasnik 1977) in the tensed group.

Levin 1983, 1984 presents an attractive explanation for this: overt operators require Case(-like) licensing, which a tensed but not an infinitival INFL provides to its local [Spec, CP]. However, as Browning 1989:144f. observes, there is a problematic exception to this: infinitival relatives do allow overt operators, provided they pied-pipe other material.²⁶ Thus we have:

(61) Overt operator in TM

- a. Kate is easy/too inaccessible (*who) to talk about.
- b. *Kate is easy/too inaccessible about whom to talk.

(62) Overt operator in infinitival relatives

- a. A person *(who) to invite. (Browning 1989:127)
- b. This is a pleasant room in which to work (Chomsky 1981:309)
- c. a(n easy) topic [about which to write] (Wilder 1991:126)

(63) Overt operator in tensed constructions

- a. the woman who won the race.
- b. John has more money than what I have. (Browning 1989:127)

Table 1 gives a more comprehensive over-view of who the different tensed and infinitival constructions; for examples and discussion, see Browning 1989 and Cinque 1990 in general, Montalbetti 1984 for the OPC, and Bhatt 1999 for infinitival relatives. The properties are self-explanatory given the preceding discussion, except for the category *overt subject*; this refers to whether the infinitival clause of the relevant construction (e.g. a TM/degree trigger with a non-expletive subject) can take an overt subject.

²⁶ Parasitic gaps are possible when tensed and never allow overt operators, *What did everyone review t before (*what) I read pg?* But this may have to do with the preposition *before*, in the same way that the lack of *wh*-movement with *for-to* infinitives has been taken as due to the Doubly Filled Comp filter.

(64) TABLE 1

Construction	TM	Degree clauses	Parasitic Gaps	Infinitival Relatives	Tensed Relatives and <i>wh</i> Q's
Sensitive to \bar{A} -islands	yes	yes	yes	yes	yes
Creates \bar{A} -islands	yes	yes	irrel.	irrel.	yes
Licenses PGs	yes	yes	yes	yes	yes
Highest subject gap	no	no	no	yes	yes
DO gap in DOC	no	no	no	yes ²⁷	yes
Subject/object asymm.	yes	yes	yes	yes	no (yes in islands)
Montalbetti's OPC	pronoun	?	?	?	trace ²⁸
Adjunct gap	no	yes	no	yes	yes
French participle accord possible	no	yes	yes	yes	yes
Tense sensitivity	high	high	high	mild	low
Embedding sensitivity	high	high	high	mild	low
Highest clause tense	inf.	inf.	inf./fin.	inf.	fin.
Overt subject	no	no	yes	yes	irrel.
Overt operator	no	no	no	pied-piped	yes

The pattern indicates that TM OP clauses, degree clauses, and parasitic gaps go together, falling under the pure \bar{A} -Agree by C_{OP} analysis.²⁹ On the other hand, the pattern of infinitival relatives suggests that *wh*-movement is at least an option, leading to the possibility of overt operators (though obligatorily deleted under recoverability), which the C_{OP} group cannot have. This would remove subject/object asymmetries from the diagnostic characteristics of $pro_{\bar{A}}$; perhaps that is just as well, since as noted there is no clear understand of how they come about.

This means that C_{OP} shows no correlation with infinitival tense or the possibility of overt subjects. On the other hand, the contrast between it and infinitival relatives in the possibility of overt operators is valuable; it suggests that the goal of C_{OP} simply must be null and that no pied-piping of the goal its \bar{A} -Agree is allowed. C_{OP} therefore does not project a specifier, a version of Levin's conclusion without the connection to tense. This answers question (ii) posed above, and by the hypothesis ventured for (iii), it also means that its goal must be the null $pro_{\bar{A}}$ because even if it stayed in-situ its \bar{A} -activation feature would not be licensed.

²⁷ Cf. ?*Looking for a book to give a friend?* vs. ?**This book is difficult to give a friend.*

²⁸ In questions; for the complex situation with traces of relativization, see Montalbetti 1984:138ff.n18.

²⁹ The only anomaly seems to be adjunct gaps in degree clauses, (i). The *too/enough* constructions which take degree clauses may also predicate their subject of a gap-less clause, often called (negative) result clause (Lasnik and Fiengo 1974:537ff., Browning 1989:27ff., 64), which may have a specified subject or a PRO controlled the matrix subject, unlike degree (and OP) clauses with gaps, (ii). (i) could be an example of a negative result clause, eliminating the problem. However, Lasnik and Fiengo 1974:558 observe that such gapless negative result clauses seem impossible unless they do in fact have subject-controlled PRO or a *for*-to infinitive, (iic). I have no good understanding of how (i) escapes this.

(i) Tuesday is too soon to leave.

(ii) a This problem is too abstract for there to be an easy solution (to it).

b This problem_i is too abstract PRO_i to be easily solved.

c This problem_i is too abstract (*for Bill) to solve it_i.

d For whom is this problem_i too abstract to solve \emptyset /*it_i.

This leaves question (i): what is the external distribution of C_{OP} clauses, outside of arbitrary selection, and is there a principled reason why C_{OP} occurs in those contexts rather than another C , aside from interpretive requirements that lead to selection of for example C_Q . Browning's 1989:26f., 53ff. idea that the ϕ -features of OP , for her an \bar{A} *pro*, must be identified, is very attractive, though the reasons are up in the air. Perhaps a head with an \bar{A} -probe must either project a specifier or have it licensed/identified externally. At any rate, in the approach developed here it means that the pure \bar{A} -Agree of C_{OP} must be licensed. This leads to promising avenues; TM and perhaps degree clauses involve ϕ -Agree between C_{OP} and a higher T where ϕ -features are expressed, and the licensing of parasitic gaps refers to ϕ /Case features (Culicover 2001:35ff. and literature cited therein). We are led to expect three broad groups of C_{OP} occurrences. First, unselected adjuncts where the parasitic gap mechanism works, since C_{OP} in/heading an adjunct island will not generally be accessible to ϕ -Agree. Second, selected positions which are within reach of the ϕ -Agree of T , but only those where no interpretive requirement is imposed by selection: that is, the raising-like predicates to which belong TM triggers and perhaps degree clause takers, with arbitrary selection for C_{OP} within this group. Finally, selected positions within the reach of other, in English covert, ϕ -probes, of small clause heads for example, here not investigated.

5 Conclusion

This is a convenient place to close this discussion of Tough Movement. Of the four core problems we started out with, the subject-gap linking problem falls out just from the syntax-semantics mapping needed for the interpretation of non-thematic positions, as does the scattered interpretation of TM subjects for quantification and selection. The subject-gap correlation problem also largely falls out from the same system, with the need to stipulate the distribution of ϕ -transparent clauses to copy-raising verbs in English. The OP -gap problem is a collection of anomalous behaviors on the part of the gap in contrast to more usual \bar{A} -gaps, and has shown promise in being treated as involving a null \bar{A} pronoun that undergoes pure \bar{A} -Agree with a higher C_{OP} ; the fact that this $pro_{\bar{A}}$ must be licensed and that C_{OP} does not project a specifier limits them to co-occurring with each other. Finally, the selection problem has been discussed more vaguely in terms of the distribution of C_{OP} . Browning's hypothesis, which is still in need of a deeper understanding but has an air of explanation to it, leads us to expect C_{OP} in position where the ϕ -features it gets from the gap are externally identified; that seems to make inroads into the distribution of clauses C_{OP} .

References

- Akmajian, Adrian. 1972. Getting Tough. *Linguistic Inquiry* 3:373–377.
Anagnostopoulou, Elena. 2003. *The syntax of ditransitives: Evidence from clitics*. The Hague: Mouton de Gruyter.
Baker, Mark. 1988. *Incorporation: A theory of grammatical function changing*. Chicago: University of Chicago Press.
Berman, Arlene. 1973. A Constraint on Tough-Movement. In *Papers from the 9th regional meeting of the Chicago Linguistic Society*, 34–43. Chicago: Chicago Linguistic Society.
Bhatt, Rajesh. 1999. Covert modality in non-finite contexts. Doctoral dissertation, University of Pennsylvania, Philadelphia.

- Boeckx, Cedric. 2002. Agree or Attract? A relativized minimality solution to a proper binding condition puzzle. In *Typological approaches to language universals*, ed. Artemis Alexiadou, 41-65. Amsterdam: John Benjamins.
- Boeckx, Cedric. 2003. *Island and chains*. Amsterdam: John Benjamins.
- Borer, Hagit. 1984. Restrictive relatives in modern Hebrew. *Natural Language & Linguistic Theory* 2:219-260.
- Borer, Hagit. 1989. Anaphoric AGR. In *The Null Subject Parameter*, ed. Osvaldo Jaeggli and Kenneth Safir, 69-109. Dordrecht: Kluwer.
- Branigan, Phil, and Marguerite MacKenzie. 2001. Altruism, \bar{A} -movement, and object agreement in Innu-aimûn. *Linguistic Inquiry* 33:385-407.
- Brody, Michael. 1993. Theta theory and arguments. *Linguistic Inquiry* 24:1-23.
- Browning, Marguerite Ann. 1989. *Null Operator Constructions*. New York: Garland.
- Bruening, Benjamin. 2001. Syntax at the edge: Cross-clausal phenomena and the syntax of Passamaquoddy. Doctoral dissertation, MIT, Cambridge, Mass.
- Calcagno, Mike. 1999. Some Thoughts on Tough Movement. In *Tübingen Studies in Head-Driven Phrase Structure Grammar*, Arbeitsberichte des SFB 340, number 132, ed. Valia Kordoni, 198-230. Tübingen: Universität Tübingen.
- Carstens, Vicky. 2003. Rethinking complementizer agreement: Agree with a Case-checked goal. *Linguistic Inquiry* 34:393-412.
- Chomsky, Noam. 1964. Current issues in linguistic theory. The Hague: Mouton de Gruyter.
- Chomsky, Noam. 1973. Conditions on transformations. In *Festschrift for Morris Halle*, ed. Stephen A. Anderson and Paul Kiparsky, 232-285. New York: Holt, Rinehart, and Winston.
- Chomsky, Noam. 1977. On *wh*-movement. In *Formal Syntax*, ed. Peter Culicover, Thomas Wasow, and Adrian Akmajian, 71 - 132. New York: Academic Press.
- Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, Noam. 1982. *Some concepts and consequences of the theory of government and binding*. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 1986a. *Barriers*. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 1986b. *Knowledge of language: Its nature, origins, and use*. New York: Praeger.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: Essays on Minimalist syntax in honor of Howard Lasnik*, ed. Roger Martin, David Michaels, and Juan Uriagereka, 89-156. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. Michael Kenstowicz, 1-52. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 2004. Beyond explanatory adequacy. In *Structures and beyond: The cartography of syntactic structures*, ed. Adrianna Belletti, 104-132. Oxford: Oxford University Press.
- Chomsky, Noam, and Howard Lasnik. 1977. Filters and Control. *Linguistic Inquiry* 8:425-504
- Cinque, Guglielmo. 1990. *Types of A'-dependencies*. Cambridge, Mass.: MIT Press.
- Culicover, Peter W. 2001. Parasitic gaps: A history. In *Parasitic gaps*, ed. Peter W. Culicover and Paul M. Postal, 3-68. Cambridge, Mass.: MIT Press.
- Culicover, Peter W., and Paul M. Postal. *Parasitic gaps*. Cambridge, Mass.: MIT Press.

- Dalrymple, Mary, and Tracy Holloway King. 2000. Missing-Object Constructions: Lexical and constructional variation. In *On-line Proceedings of the LFG2000 Conference*, ed. Miriam Butt and Tracy Holloway King. Available at <http://cslipublications.stanford.edu/LFG/5/lfg00dalrymple-king.pdf>.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, Mass.: MIT Press.
- Dowty, David R., Robert E. Wall, and Stanley Peters. 1985. *Introduction to Montague semantics*. Dordrecht: D. Reidel.
- Epstein, Samuel David. 1984. Quantifier-*pro* and the LF representation of PRO_{arb}. *Linguistic Inquiry* 15:499-504.
- Epstein, Samuel David. 1989. Quantification in null operator constructions. *Linguistic Inquiry* 20:647-658.
- Fillmore, Charles J. 1965. *Indirect object constructions in English and the ordering of transformations*. Mouton: The Hague.
- Fox, Danny. 2002. Antecedent-contained deletion and the copy theory of movement. *Linguistic Inquiry* 33:63-96.
- Goh, Gwang-Yoon. 2000. Pragmatics of the English Tough Construction. *NELS* 30, 219–230. Amherst, Mass.: GLSA.
- Grover, Claire. 1995. Rethinking Some Empty Categories: missing objects and parasitic gaps in HPSG. Doctoral dissertation, University of Essex.
- Hagstrom, Paul. 1998. Decomposing questions. Doctoral dissertation, MIT, Cambridge, Mass.
- Heim, Irene, and Angelika Kratzer. 1998. *Semantics in generative grammar*. Oxford: Blackwell.
- Heycock, Caroline. 1994. Layers of predication: The non-lexical syntax of clauses. New York: Garland.
- Higginbotham, James. Logical form, binding, and nominals. *Linguistic Inquiry* 14:395-420.
- Holmberg, Anders. 2001. Am I Unscientific? A Reply to Lappin, Levine, and Johnson. *Natural Language and Linguistic Theory* 18:837–842.
- Horn, George M. 2003. Idioms, metaphors, and syntactic mobility. *Journal of Linguistics* 39:245-273.
- Hornstein, Norbert. 2000. *Move! A Minimalist Theory of Construal*. Oxford: Blackwell.
- Hukari, Thomas E. and Robert D. Levine. 1987. Rethinking connectivity in unbounded dependency constructions. In *WCCFL* 6, 91-102. Stanford, Calif.: Stanford Linguistics Association.
- Hukari, Thomas E., and Robert D. Levine. 1991. The complement structure of Tough Constructions. *ESCOL* 90, 124–135. Cascadilla Press: Ithaca, New York.
- Jacobson, Pauline. 2000. Extraction out of Tough. *Snippets* 1:7-8. Available at <http://www.lededizioni.it/ledonline/snippets.html>.
- Jónsson, Johannes Gísli. 1996. Clausal architecture and case in Icelandic. Doctoral dissertation, University of Massachusetts, Amherst.
- Kaplan, Ronald M. and Joan Bresnan. 1982. Lexical-Functional Grammar: A formal system for grammatical representation. In *The mental representation of grammatical relations*, ed. Joan Bresnan, 173-281. Cambridge, Mass.: MIT Press.
- Kayne, Richard. 1975. *French Syntax*. Cambridge, Mass.: MIT Press.
- Kayne, Richard. 1981. ECP extensions. *Linguistic Inquiry* 12:93-133.
- Kayne, Richard. 1989. Facets of Romance past participle agreement. In *Dialect variation and the theory of grammar*, ed. P. Benincà, 85-103, Dordrecht: Foris.

- Kim, Boomee. 1995. Predication in Tough Constructions. In *Proceedings of the 14th West Coast Conference on Formal Linguistics*, 271–285. Stanford, Calif.: Stanford Linguistics Association.
- Kinyalolo, Kasangati K. W. 1991. Syntactic dependencies and the Spec-head agreement hypothesis in Kilega. Doctoral dissertation, UCLA, Los Angeles, Calif.
- Kratzer, Angelika. 1995. Stage-level and individual-level predicates. In *The generic book*, ed. Gregory N. Carlson and Francis Jeffry Pelletier, 125–175. Chicago: Chicago University Press.
- Landau, Idan. 2000. *Elements of control: Structure and meaning in infinitival constructions*. Dordrecht: Kluwer.
- Lasnik, Howard. 1999. *Minimalist Analysis*. Oxford: Blackwell.
- Lasnik, Howard. 2002. Feature movement or agreement at a distance? In *Remnant movement, F-movement and the T-model*, ed. by Artemis Alexiadou, Elena Anagnostopoulou, Sjef Barbiers, and Hans-Martin Gärtner, 189–208. Amsterdam: John Benjamins.
- Lasnik, Howard, and Robert Fiengo. 1974. On complement object deletion. *Linguistic Inquiry* 5:535–572.
- Lasnik, Howard, and Tim Stowell. 1991. Weakest crossover. *Linguistic Inquiry* 22:687–720.
- Lasnik, Howard, and Juan Uriagereka. *A course in GB syntax*. Cambridge, Mass.: MIT Press.
- Levin, Juliette. 1983. Government relations and the structure of INFL. In *MIT Working Papers in Linguistics* 5, 121–150. Department of Linguistics and Philosophy, MIT, Cambridge, Mass.
- Levin, Juliette. 1984. Government relations and the distribution of empty operators. *NELS* 14. Amherst, Mass.: GLSA.
- Levine, Robert D. 1984a. A note on Right Node Raiding, *Tough* Constructions, and Reanalysis rules. *Linguistic Analysis* 13:159–172.
- Levine, Robert D. 1984b. Against Reanalysis rules. *Linguistic Analysis* 14:3–30.
- López, Luis. 2002. On agreement: Locality and feature valuation. In *Typological approaches to language universals*, ed. Artemis Alexiadou, 165–210. Amsterdam: John Benjamins.
- Manzini, Maria Rita. 1998. A minimalist theory of weak islands. In *The limits of syntax*, ed. Peter Culicover and Luisa McNally, 185–209. San Diego: Academic Press.
- Martin, Roger. 1996. A minimalist theory of PRO and control. Doctoral dissertation, University of Connecticut, Storrs.
- Massam, Diane. 1985. Case theory and the projection principle. Doctoral dissertation, MIT, Cambridge, Mass.
- McCloskey, James. 1990. Resumptive pronouns, \bar{A} -binding and levels of representation in Irish. In *The syntax of the modern Celtic Languages*, Syntax and Semantics 23, ed. Randall Hendrick, 199–248. New York: Academic Press.
- McCloskey, James. 2002. Resumption, successive cyclicity, and the locality of operations. In *Derivation and explanation*, ed. Samuel David Epstein and T. Daniel Seeley, 184–226. Oxford: Blackwell.
- Miller, Philip H. and Ivan A. Sag. 1997. French clitic movement without clitics or movement. *Natural Language and Linguistic Theory* 15:573–639.
- Montalbetti, Mario. 1984. After binding. Doctoral dissertation, MIT, Cambridge, Mass.
- Moro, Andrea. 1997. *The raising of predicates*. Oxford: Oxford University Press.
- Nakamura, Masanori. 1997. Object extraction in Bantu applicatives: Some implications for minimalism. *Linguistic Inquiry* 28:252–280.

- Nanni, Debbie L. 1978. The easy class of adjectives in English. Doctoral dissertation, University of Massachusetts, Amherst.
- Nanni, Debbie L. 1980. On the Surface Syntax of Constructions with Easy-type Adjectives. *Language* 56:568-581.
- Nissenbaum, John. 2001. Investigations of covert phrasal movement. Doctoral dissertation, MIT, Cambridge, Mass.
- Nunberg, Geoffrey, Ivan A. Sag, and Thomas Wasow. 1994. Idioms. *Language* 70:491-538.
- Oehrle, Richard Thomas. 1975. The grammatical status of the English dative alternation. Doctoral dissertation, MIT, Cambridge, Mass.
- Ouhalla, Jamal. 1993. Subject extraction, negation, and the anti-agreement effect. *Natural Language and Linguistic Theory* 11:477-518.
- Pesetsky, David. 1982. Paths and categories. Doctoral dissertation, MIT, Cambridge, Mass.
- Polinsky, M., & E. Potsdam. 2001. Long-distance agreement and topic in Tsez. *Natural Language & Linguistic Theory* 19:583-646.
- Postal, Paul M. 1971. *Cross-over phenomena*. New York: Holt, Reinhart and Winston.
- Postal, Paul M. 1974. *On raising*. Cambridge, Mass.: MIT Press.
- Postal, Paul M. 1997. Strong cross-over violations and binding principles. *ESCOL 97*. Cascadilla Press: Ithaca, New York.
- Postal, Paul M. 1998. *Three investigations of extraction*. MIT Press: Cambridge, Mass.
- Postal, Paul M. 2002. Skeptical linguistic essays. Ms., New York University, New York.
- Postal, Paul M. and John Robert Ross. 1971. ¡Tough movement Si, Tough Deletion No! *Linguistic Inquiry* 2:544-546.
- Potsdam, Eric, and Jeffrey T. Runner. 2001. Richard returns: Copy-raising and its implications. In *Papers from the 37th regional meeting of the Chicago Linguistic Society*, 206-222. Chicago: Chicago Linguistic Society.
- Reinhart, Tanya. 2000. Strategies of anaphora resolution. In *Interface strategies*, ed. Hans Bennis, Martin Everaert, and Eric Reuland, 295-325. Amsterdam: Royal Academy of Arts and Sciences.
- Reinhart, Tanya, and Eric Reuland. 1991. Anaphors and logophors: An argument structure perspective. In *Long-distance Anaphora*, ed. Jan Koster and Eric Reuland, 283-321. Cambridge: Cambridge University Press.
- Reinhart, Tanya, and Eric Reuland. 1993. Reflexivity. *Linguistic Inquiry* 24:657-720.
- Reuland, Eric. 2001. Primitives of binding. *Linguistic Inquiry* 32:439-492.
- Rezac, Milan. 2003. The fine structure of cyclic Agree. *Syntax* 6:156-182.
- Rezac, Milan. 2004a. Elements of cyclic syntax: Agree and Merge. Doctoral dissertation, University of Toronto, Toronto, Ont.
- Rezac, Milan. 2004b. Agree and Merge. Ms., University of the Basque Country (UPV-EHU), Vitoria-Gasteiz. Available at <http://ling.auf.net/lingBuzz/000041>.
- Richards, Norvin. 2001. *Movement in language: Interactions and architectures*. Oxford: Oxford University Press.
- Rizzi, Luigi. 1982. *Issues in Italian syntax*. Dordrecht: Foris.
- Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge, Mass.: MIT Press.
- Rizzi, Luigi. 1997. The fine structure of the left periphery. In *Elements of grammar*, ed. Liliane Haegeman, 281-337. Dordrecht: Kluwer.
- Rizzi, Luigi. 2004. On the form of chains: Criterial positions and ECP effects. Ms., University of Siena.

- Romero, Maribel. 1997. Focus and reconstruction effects in *wh*-phrases. Doctoral dissertation, University of Massachusetts, Maherst.
- Rosenbaum, Peter Steven. 1965. The grammar of English predicate complement constructions. Doctoral dissertation, MIT, Cambridge, Mass.
- Ross, John Robert. 1967. Constraints on variables in syntax. Doctoral dissertation, MIT, Cambridge, Mass.
- Rullmann, Hotze and Sigrid Beck. 1998. Reconstruction and the Interpretation of Which-Phrases. In *Proceedings of the Tübingen Workshop on Reconstruction*, Arbeitspapiere des Sonderforschungsbereichs 340, number 127, ed. Graham Katz Shin-Sook Kim, and Heike Winhart, 223-256. University of Tübingen and Stuttgart.
- Sauerland, Uli. 1998. The meaning of chains. Doctoral dissertation, MIT, Cambridge, Mass.
- Sauerland, Uli. 2004. The interpretation of traces. *Natural Language Semantics* 12:63-127.
- Schachter, Paul. 1981. Lovely to look at. *Linguistic Analysis* 8:431-448.
- Svenonius, Peter. 2000. Quantifier movement in Icelandic. In *The derivation of VO and OV*, ed. Peter Svenonius, 255-292. Amsterdam: John Benjamins.
- Svenonius, Peter. 2004. On the edge. In *Peripheries: Syntactic edges and their effects*, ed. David Adger, Cécile de Cat, and George Tsoulas, 259-287. Dordrecht: Kluwer.
- Tellier, Christine. On some distinctive properties of French parasitic gaps. In *Parasitic gaps*, ed. Peter W. Culicover and Paul M. Postal, 341-369. Cambridge, Mass.: MIT Press.
- Uriagereka, Juan. 2000. In defense of Deep Structure. Ms., University of Maryland, College Park.
- Watanabe, Akira. 2000. Feature copying and binding: Evidence from complementizer agreement and switch reference. *Syntax* 3:159-181.
- Wilder, Christopher. 1991. Tough Movement Constructions. *Linguistische Berichte* 132:115-132.
- Williams, Edwin. 1980. Predication. *Linguistic Inquiry* 11:203-238.
- Williams, Edwin. 1983. Syntactic vs. Semantic Categories. *Linguistics and Philosophy* 6:423-446.