

Syntactic vs. semantic intervention in *tough*-constructions

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1 Introduction

• *A tough history*

Ever since the early days of generative syntax, *tough*-predicates have proven considerably elusive to analysis (e.g. Lees 1960; Chomsky 1964). *Tough*-predicates occur in one of two structural frames which are nearly synonymous in meaning:

1. *Tough-construction*

The matrix subject is obligatorily interpreted as coreferential with the non-subject gap position in the embedded nonfinite clause:

(1) Alex_{*i*} is tough to please _____{*i*}.

2. *Expletive construction*

The matrix-subject position is filled by the expletive *it*:

(2) It is tough to please Alex.

• *Two accounts of tough-constructions*

Although there is agreement that \bar{A} -movement occurs inside the embedded clause (Chomsky 1977, 1982), how this embedded movement dependency is linked to the surface subject has been a matter of controversy. Analyses of *tough*-constructions divide into two groups: the long-movement analysis and the base-generation analysis.

1. *Long-movement analysis*

The matrix subject originates in the embedded gap position. First, it \bar{A} -moves to the edge of the embedded clause. Second, it subsequently *A*-moves to the matrix subject position.

(3) Alex_{*i*} is tough [*t*_{*i*} PRO_{ARB} to please *t*_{*i*}]

The diagram shows two arrows below the sentence. The first arrow, labeled 'A', points from the gap position '____' in the embedded clause to the matrix subject 'Alex_{*i*}'. The second arrow, labeled ' \bar{A} ', points from the edge of the embedded clause (the position of *t*_{*i*}) to the matrix subject 'Alex_{*i*}'.

⇒ E.g. Rosenbaum (1967); Postal (1971); Postal & Ross (1971); Brody (1993); Hornstein (2001); Hicks (2009); Hartman (2011, 2012a,b)

2. *Base-generation analysis*

The matrix subject is base-generated in that position. A null operator \bar{A} moves from the gap position to the edge of the embedded clause. The matrix subject is interpreted as coreferential with the null operator.

(4) Alex_{*i*} is tough [Op_{*i*} PRO_{ARB} to please *t*_{*i*}]

The diagram shows a single arrow labeled ' \bar{A} ' pointing from the gap position '____' in the embedded clause to the edge of the embedded clause (the position of Op_{*i*}).

⇒ E.g. Ross (1967); Akmajian (1972); Lasnik & Fiengo (1974); Chomsky (1977, 1981); Williams (1983); Rezac (2006); Fleisher (to appear)

• *A tale of two for-phrases*

It is well-known since at least Chomsky (1973) that two *for*-phrases can occur in the expletive construction: an **experiencer** and an **embedded subject**. However, only one can occur in the corresponding *tough*-construction.

- (5) a. It is easy **for the rich for the poor** to do the work.
b. The work_{*i*} is easy **for the rich (*for the poor)** to do _____{*i*}.

⇒ *A longstanding question*

Which of the two *for*-phrases has disappeared in a *tough*-construction?

* *Claims made in this talk*

We argue that it is the experiencer phrase that intervenes in *tough*-constructions. This intervention is crucially shown to extend to nonmovement structures. We propose a base-generation analysis of *tough*-constructions wherein the intervention effects follow from the compositional semantics of *tough*-predicates.

2 Hartman's Generalisation

- **Challenge: Interpretation of the for-phrase**

One challenge is that in the absence of an embedded subject, an experiencer phrase dictates the construal of the embedded PRO subject. This means that the meaning alone does not make it clear where the *for*-phrase sits. Therefore, we must look elsewhere for evidence about the status of the *for*-phrase.

- * **Generalisation**

Hartman (2011, 2012a,b) argues that it is the embedded subject that survives, meaning that an experiencer intervenes in a *tough*-construction:

(6) **HARTMAN'S GENERALISATION**

In a *tough*-construction, no experiencer phrase can intervene between the *tough*-predicate and the infinitival clause.

- **Hartman's arguments**

1. **Unambiguous PPs**

When the experiencer phrase is headed by a preposition other than *for*, this experiencer phrase cannot occur in a *tough*-construction. Crucially, these prepositions cannot introduce an embedded infinitival subject.

- (7) a. It is important (**to Mary**) to avoid cholesterol.
b. Cholesterol_i is important (***to Mary**) to avoid _____i.

- (8) a. It was very hard (**on me**) to give up sugar.
b. Sugar_i was very hard (***on me**) to give up _____i.

2. **Scope**

A *for*-phrase can take scope above or below the matrix adjective in the expletive construction (9a). This corresponds to the two construals: (i) embedded subject or (ii) adjectival modifier. In the corresponding *tough*-construction, only low scope is possible (9b). This indicates that the *for*-phrase must be parsed as the embedded subject.

- (9) a. It is impossible **for every student** to fail this class.
(*impossible* >> *every student*; *every student* >> *impossible*)
b. This test_i is impossible **for every student** to fail _____i.
(*impossible* >> *every student*; **every student* >> *impossible*)

3. **Crosslinguistic evidence**

In languages where infinitival subjects cannot be introduced by a preposition, a PP must modify the adjective. In a *tough*-construction, such a PP is disallowed:

(10) *Italian*

- a. È impossibile (**per gli studenti**) capire questi problemi.
is impossible for the students understand these problems
'It is impossible (for the students) to understand these problems.'
- b. Questi problemi_i sono impossibile (***per gli studenti**) da
these problems are impossible for the students DA
capire _____i.
understand ____
'These problems are impossible (***for the students**) to understand.'

[Hartman 2012a:123]

- **Our additional arguments**

4. **Partial control**

Partial control is possible in an expletive construction because the *for*-phrase can be construed as an experiencer that controls PRO. However, partial control is not possible in a *tough*-construction because the *for*-phrase must be construed as an embedded subject.

- (11) a. It will be tough for Mary_i [PRO_{i+} to gather in this park].
b. # This park_i will be tough [for Mary to gather in _____i].

5. **Animacy**

The *for*-phrase in a *tough*-construction can be inanimate, which would be incompatible with an experiencer construal:

- (12) a. It is easy **for the chalk** to stick to the blackboard.
b. The blackboard_i is easy **for the chalk** to stick to _____i.

6. **Arbitrary experiencer interpretation**

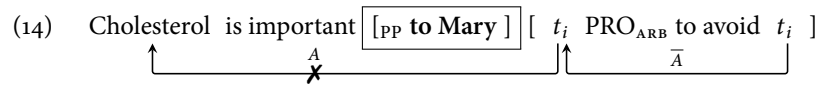
The experiencer in a *tough*-construction can be interpreted as arbitrary, even in the presence of a *for*-phrase. This indicates that the *for*-phrase must be construed as the embedded subject:

- (13) a. It is scary for Sue to walk the tightrope **courageously**.
b. The tightrope_i is scary for Sue to walk _____i **courageously**.

⇒ This evidence shows that an experiencer phrase is impossible in *tough*-constructions; see Hartman's Generalisation in (6).

- **Hartman's analysis: Defective intervention**

Hartman takes this restriction (6) as evidence for a long-movement analysis of *tough*-constructions. He argues that the intervention is syntactic: an experiencer PP serves as a **defective intervenor** for A-movement across it.



⇒ **But wait...**

We will show that when submitted to closer scrutiny, the PP intervention effects are not syntactic, but rather semantic in nature.

3 Intervention in nonmovement structures

⇒ Experiencer phrases also intervene in structures that do **not** involve movement.

- **Pretty-predicates**

Adjectives like *pretty* can occur in a *tough*-construction, but not an expletive construction:

- (15) a. Marigolds_i are **pretty** to look at _____i.
 b. *It is **pretty** to look at marigolds.

- However, although a *pretty*-predicate can in principle occur with an experiencer phrase, the experiencer phrase cannot occur between the predicate itself and the embedded clause:

- (16) a. Mary is pretty [PP to John].
 b. *Mary_i is pretty [PP to John] to look at _____i.
 c. [PP To John], Mary_i is pretty to look at _____i.

- **Gapped degree phrases**

Like *pretty*-predicates, gapped degree phrases (GDPs) can occur in a *tough*-construction, but lack the expletive counterpart:

- (17) a. This table_i is **too heavy** to lift _____i.
 b. *It is **too heavy** to lift this table.

- GDPs can be modified by an experiencer phrase, but a *for*-phrase between the adjective and the infinitival clause is in principle ambiguous. However, while (18b) shows that a *for*-phrase is able to modify the matrix predicate, scope reveals that it cannot do so when it is between the predicate and the embedded clause (18c).

- (18) a. The table_i is too heavy to lift _____i [PP for only one worker].
 (only one >> too heavy; too heavy >> only one)
 b. [PP For only one worker] the table_i is too heavy to lift _____i.
 (only one >> too heavy; *too heavy >> only one)
 c. The table_i is too heavy [PP for only one worker] to lift _____i.
 (*only one >> too heavy; too heavy >> only one)

⇒ In GDP, an intervening *for*-phrase must be within the embedded clause. It cannot modify the matrix predicate.

- **Intervention of noninterveners**

In addition, Bruening (2014) observes that it is not only experiencer phrases that are illicit in *tough*-construction, but adjuncts in general:

- (19) a. It is always annoying [PP at meetings] to talk about the budget.
 b. *The budget_i is always annoying [PP at meetings] to talk about _____i.

- The same intervention effects of adjuncts in general can be observed for *pretty*-predicates and GDPs:

- (20) a. Mary will be pretty [PP at her wedding].
 b. *Mary_i will be pretty [PP at her wedding] to look at _____i.
 (21) a. [PP In this awkward position] the table_i will be too large to lift _____i.
 b. *The table_i will be too large [PP in this awkward position] to lift _____i.

* We propose the revised generalisation in (22):

(22) **REVISED HARTMAN'S GENERALISATION**

In *tough*-constructions, gapped degree phrases and *pretty*-predicates, no adjunct may occur between the adjective and the infinitival clause.

- *Conclusion*

It is unclear how this extended generalisation could be captured on a defective intervention account and more generally on a syntactic account, because intervention arises in movement and nonmovement structures alike. The next section shows how the facts follow from a base-generation account.

4 Proposal

- *Analysis in a nutshell*

- *Tough*-predicates come in two variants: (i) one version that combines with a **proposition**, corresponding to the expletive construction, and (ii) another version that combines with a **property of individuals**, corresponding to the *tough*-construction.
- In a *tough*-construction, the embedded clause is a **null-operator** structure wherein a null operator \bar{A} -moves to the clause edge triggering abstraction over an individual variable, thus forming a property of individuals:

$$(23) \quad \begin{array}{c} \overbrace{\text{XP is tough [Op}_i \text{ [PRO}_{\text{ARB}} \text{ to please } t_i \text{]]}}^{\bar{A}} \\ \rightsquigarrow \text{LF: XP is tough } \lambda x \text{ [PRO}_{\text{ARB}} \text{ to please } x \text{]} \end{array}$$

- Intervention effects result from an **irresolvable semantic-type mismatch**. The property-taking version of a *tough*-predicate yields an AP that itself denotes a property of individuals. Therefore, it cannot combine with experiencer PPs and adjuncts, which only combine with propositions.

- To simplify the discussion, the focus will be on *tough*-predicates, but everything that follows applies equally to *pretty*-predicates and GDPs.

4.1 Semantics of *tough*-predicates

- *A judge-based semantics*

Tough-predicates have the property that their truth is evaluated with respect to some individual, i.e. whether something is tough is subjective.

- To capture this property, we propose a judge-based semantics of *tough*-predicates wherein they are subjective to the **JUDGE** of the proposition. This is represented as an argument j of the denotation function (following Stephenson 2007, 2010; Lasersohn 2005).

- * *Two versions of tough*

Tough-predicates come in two variants: (i) a proposition-taking version (24), which corresponds to the expletive construction, and (ii) a property-taking version (25), which corresponds to the *tough*-construction:

$$(24) \quad \begin{array}{l} \text{Expletive-construction variant} \qquad \langle st, \langle d, st \rangle \rangle \\ \llbracket \text{tough}_{\text{EXPL}} \rrbracket^j = \\ \lambda p_{st} \lambda d_d \lambda w_s . \forall \langle w', j' \rangle \in \text{ACC}_{w,j} \left[\text{TOUGH}_{w',j'} (\llbracket p \rrbracket^{j'}(w'))(d) \right] \\ \text{(In all of } j \text{'s doxastic alternatives, } p \text{ is } d \text{-tough to } j \text{.)} \end{array}$$

$$(25) \quad \begin{array}{l} \text{Tough-construction variant}^1 \qquad \langle \langle e, st \rangle, \langle d, \langle e, st \rangle \rangle \rangle \\ \llbracket \text{tough}_{\text{TC}} \rrbracket^j = \\ \lambda Q_{\langle e, st \rangle} \lambda d_d \lambda x_e \lambda w_s . \forall \langle w', j' \rangle \in \text{ACC}_{w,j} \left[\text{TOUGH}_{w',j'} (\llbracket Q \rrbracket^{j'}(x)(w'))(d) \right] \\ \text{(In all of } j \text{'s doxastic alternatives, } Q(x) \text{ is } d \text{-tough to } j \text{.)} \end{array}$$

$$(26) \quad \text{ACC}_{w,x} = \{ \langle w', y \rangle : \text{it is compatible with what } x \text{ believes in } w \text{ for } x \text{ to be } y \text{ in } w' \}$$

$$(27) \quad \text{TOUGH}_{w,j}(p)(d) \Leftrightarrow p \text{ is at least } d \text{-tough to } j \text{ in } w$$

- Both $\text{tough}_{\text{EXPL}}$ and tough_{TC} assert that the proposition p (saturated) or $Q(x)$ (to be saturated) is d -tough according to the judge j in all the centred worlds (world-individual pairs) where the judge j is the centre.

\Rightarrow *The crucial distinction*

$\text{tough}_{\text{EXPL}}$ and tough_{TC} differ in the arguments that they combine with. Setting aside the degree and world arguments:

- $\text{tough}_{\text{EXPL}}$ combines with a single propositional argument λp .
- tough_{TC} combines first with an argument denoting a property of individuals λQ and then with an individual argument λx . The predicate Q is subsequently saturated by x .

¹ We assume that tough_{TC} combines with the degree variable before the *tough*-subject; this simplifies the semantics somewhat. However, nothing critical hinges on this decision.

- **Null-operator structure**

In the *tough*-construction, the embedded clause is a **null-operator** structure formed by \bar{A} -movement of the null operator from the gap position to the clause edge. The null operator is interpreted as a λ -abstraction over its trace (Nissenbaum 2000), forming a property of individuals:

$$(28) \quad [\text{Op}_i [\dots t_i \dots]] \rightsquigarrow \text{LF: } \lambda x [\dots x \dots]$$

- **PRO and the judge**

The embedded clause of a *tough*-predicate contains PRO, which is obligatorily coreferential with the judge of the *tough*-predicate (Bhatt & Izvorski 1997; Epstein 1984; Lebeaux 1984; Bhatt & Pancheva 2006):

$$(29) \quad \text{Implicit judge (with generic interpretation)} \rightarrow \text{PRO}_{\text{ARB}}$$

It is fun [PRO_{ARB} to play hockey]

\rightsquigarrow GEN x [it is fun for x for x to play hockey]

$$(30) \quad \text{Overt judge}_i \rightarrow \text{PRO}_i \quad (30a) \neq (30b)$$

a. It was tough [on Mary_{*i*}] [PRO_{*i*}/_{**j*} to avoid cholesterol]

\rightsquigarrow It was tough on Mary for Mary to avoid cholesterol

b. It was tough [on Mary] [for Bill to avoid cholesterol]

- For example, (30a) cannot have an interpretation analogous to (30b) in which PRO would refer to *Bill*. Rather, PRO must refer to *Mary*.
- This generalisation is captured by PRO referring directly to the judge j , as independently proposed by Stephenson (2007, 2010):

$$(31) \quad \llbracket \text{PRO} \rrbracket^j = j \quad [\text{Stephenson 2007, 2010}]$$

- When not explicitly specified, the judge parameter j is then interpreted either generically or as referring to some contextually salient individual(s).

4.2 Intervention is a semantic-type mismatch

- **Semantics of the experiencer PP**

The role of the experiencer PP is to overtly specify the judge. Let us assume that it is introduced by the functional head Appl⁰:

$$(32) \quad \llbracket \text{Appl}^0 \rrbracket^j = \lambda p_{st} \lambda j'_e \lambda w_s \cdot \llbracket p \rrbracket^{j''} (w) \quad \langle st, \langle e, st \rangle \rangle$$

(Shift the judge of the proposition p to j'' .)

- In (32), Appl⁰ combines first with a propositional argument λp and then with the experiencer PP $\lambda j''$. It shifts the judge argument of the denotation function for p to the explicit individual(s) denoted by the experiencer PP.

\Rightarrow **Only attaches to propositions**

Crucially, Appl⁰ only combines with propositions. This can be observed outside the context of *tough*-predicates with predicates of personal taste, which are also judge-dependent:

$$(33) \quad \text{a. } \llbracket [\text{PP To Kyle,}] [\text{the rutabagas are tasty}] \rrbracket.$$

$$\text{b. } \llbracket [\text{The rutabagas are tasty}] [\text{PP to Kyle}] \rrbracket.$$

$$\text{c. } * \llbracket \text{The rutabagas are } [\text{PP to Kyle}] \text{ tasty.} \rrbracket$$

- In (33a) and (33b), the experiencer PP attaches high in the structure, at the propositional level, and is linearised to either the left or the right. (33c) shows that the experiencer PP cannot attach in a medial, nonpropositional position.

- **Extended adjectival projection**

The structure of the extended adjectival projection is in (34). Appl⁰ selects for an AP and is itself selected by aP . In this sense, the extended adjectival projection parallels the extended verbal projection.

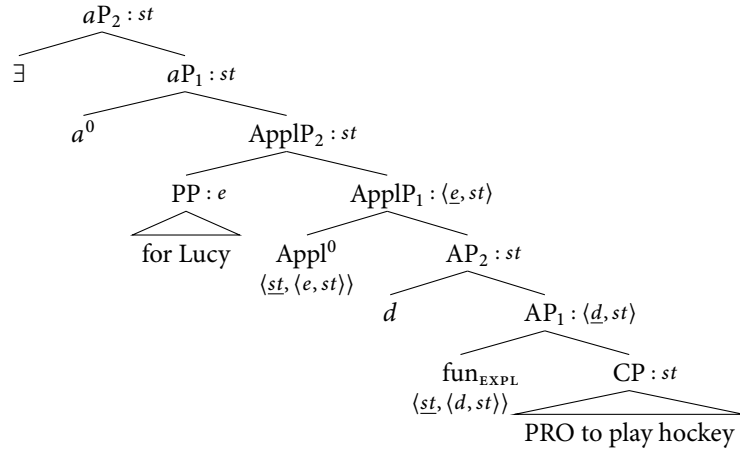
$$(34) \quad [_{aP} \dots a^0 [_{\text{ApplP}} \dots \text{Appl}^0 [_{AP} \dots A^0 \dots]]]$$

- We make the following two assumptions:
 - The correct linear order of the experiencer PP with respect to the adjective is derived by head movement of A^0 to a^0 .
 - The *tough*-subject is merged in [Spec, aP], parallel to the external argument merging in [Spec, vP].

✓ **Expletive construction**

In the expletive construction, as the AP denotes a **proposition**, it can successfully combine with Appl^0 and therefore with an experiencer PP:

(35) *It is fun [for Lucy] [PRO to play hockey]*



- $[[AP_2]]^j = \lambda w . \forall \langle w', j' \rangle \in \text{ACC}_{w,j} [\text{FUN}_{w',j'}(\text{PLAY}(\text{hockey})(j')(w'))(d)]$
(Proposition: j finds j playing hockey to be d -fun.)
- $[[\text{ApplP}_1]]^j = \lambda j'' \lambda w . \forall \langle w', j' \rangle \in \text{ACC}_{w,j''} [\text{FUN}_{w',j'}(\text{PLAY}(\text{hockey})(j')(w'))(d)]$
(The set of x such that x finds x playing hockey to be d -fun.)
- $[[aP_2]]^j = \lambda w . \exists d \forall \langle w', j' \rangle \in \text{ACC}_{w,\text{Lucy}} [\text{FUN}_{w',j'}(\text{PLAY}(\text{hockey})(j')(w'))(d)]$
(Proposition: Lucy finds Lucy playing hockey to be d -fun.)

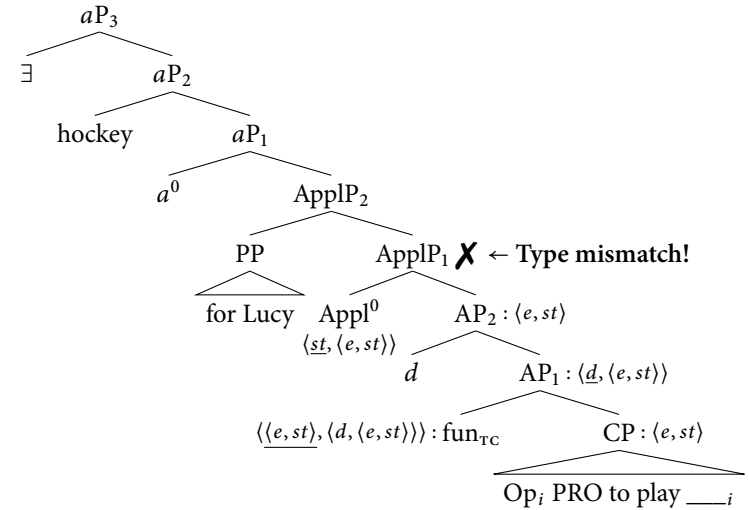
- The derivation in (35) proceeds as follows:
 - The *tough*-predicate *fun* combines with the CP and the degree variable to form an AP denoting a proposition.
 - Appl^0 takes the AP as its propositional argument, returning a property of individuals wherein the judge of the proposition denoted by AP is shifted to the unsaturated individual argument $\lambda j''$ of Appl^0 .
 - This individual argument is saturated with the experiencer PP.
 - Last, existential closure applies over the degree variable.

⇒ Crucially, the AP in (35) denotes a proposition and is of the **correct semantic type** to compose with Appl^0 . As a result, the expletive construction can occur with an experiencer PP between the adjective and the embedded clause.

✗ **Tough-construction**

However, in the *tough*-construction, Appl^0 is unable to combine with the AP because it denotes a property of individuals. This creates an **irresolvable semantic-type mismatch**.

(36) **Hockey is fun [for Lucy] [Op_i PRO to play t_i]*



- The derivation in (36) proceeds as follows:
 - The *tough*-predicate *fun* combines with the CP and the degree variable to form an AP denoting a property of individuals.
 - Next, Appl^0 tries to combine with the AP. Appl^0 wants a propositional argument, but the AP denotes a property. With no way to semantically compose these two elements, the derivation crashes.

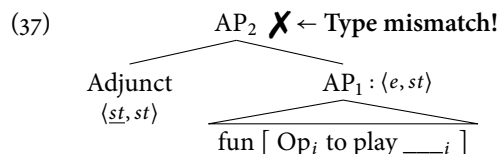
• **Consequences**

This analysis accounts for the other properties of PP intervention as well:

✗ **Adjuncts also crash the semantics**

The same kind of semantic-type mismatch in (36) occurs for intervening adjuncts as well because they are of type $\langle st, st \rangle$ (ignoring tense) and want a

propositional argument. The AP in a *tough*-construction, which denotes a property of individuals, therefore cannot compose with these adjuncts:



✓ *Interveners can occur elsewhere*

Although experiencer PPs and adjuncts cannot occur between the adjective and the embedded clause, our analysis predicts that they should be able to attach in the structure to a higher node if that node denotes a proposition. This prediction bears out:

(38) (To Mary) cholesterol is important (*to Mary) to avoid (to Mary)

(39) (At XMas) cholesterol is important (*at XMas) to avoid (at XMas)

- In (38) and (39), what would intervene between the adjective and the embedded clause can in fact attach at the edge of the matrix clause—because this node denotes a proposition.

4.3 Section summary

- *Tough*-predicates come in two variants: (i) a proposition-taking version, which corresponds to the expletive construction, and a (ii) property-taking version, which corresponds to the *tough*-construction.
- In a *tough*-construction, the embedded clause is a null-operator structure wherein a null operator \bar{A} -moves from the gap position to the clause edge triggering abstraction over an individual variable.
- Experiencer PPs and adjuncts both yield an irresolvable semantic-type mismatch in a *tough*-construction because the AP denotes a property, not a proposition. This prevents the intervener from occurring between the embedded clause and the adjective.

5 Extensions and further issues

- The base-generation analysis that we propose extends beyond the intervention facts we used to motivate it. In particular, it handles without further ado a number of properties of *tough*-constructions which have in part proven elusive to long-movement accounts.

5.1 No reconstruction

- It is well-known that the *tough*-subject cannot take scope under the *tough*-predicate (Postal 1974), as in (40a). Since A-movement can at least in principle reconstruct (40b), this should be a possibility according to long-movement accounts.

(40) a. **Only wide scope in *tough*-constructions:**

Someone is difficult to please.

(someone >> difficult; *difficult >> someone)

b. **Low scope possible in A-raising:**

Someone seems to be sick.

(someone >> seems; seems >> someone)

- This is unproblematic on a **base-generation account**: There is no reconstruction because there is no movement.

5.2 No improper movement

- Long-movement accounts standardly postulate an $A-\bar{A}-A$ movement chain (e.g. Hartman 2011), a configuration known as **hyperraising**, an instance of **improper movement**, which is otherwise ungrammatical:

(41) *John seems [_{CP} t [_{TP} t likes Mary]]

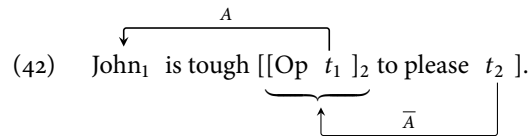
- **Problem for long-movement accounts**

Why the same movement chain should be well-formed in *tough*-constructions, but ungrammatical everywhere else is a long-standing problem for long-movement analyses.

- **A smuggling derivation?**

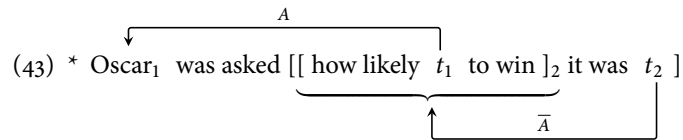
In a recent attempt to resolve this paradox, Hicks (2009) postulates a smuggling account: The overt DP and the null operator form a complex DP in the base

position. This complex DP raises to the embedded [Spec, CP]. The overt DP is then subextracted to the matrix [Spec, TP] position.



• **Problem for smuggling account**

Though this analysis does not involve an A- \bar{A} -A chain, this revised derivation is likewise ungrammatical outside of *tough*-constructions (Abels 2007):



• **Conclusion**

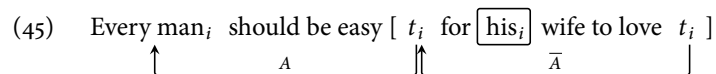
There does not currently exist a long-movement theory of *tough*-constructions that reconciles it independently observable constraints on A-movement. This is unproblematic on a base-generation account as it does not invoke any A-movement.

5.3 No crossover

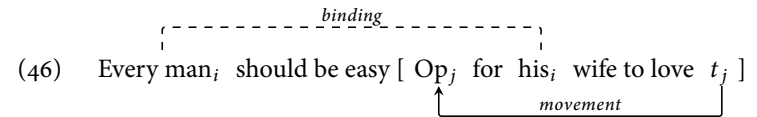
- *Tough*-constructions exhibit a long-noticed by rarely addressed paradox: Despite the compelling evidence for \bar{A} -movement within the infinitival clause, this movement does **not** trigger **weak crossover effects** (Lasnik & Stowell 1991).

(44) Every man_i should be easy for his_i wife to love.

- On a **long-movement account**, (45) has to involve \bar{A} -movement of *every man* over *his*. This crossover should make the example ungrammatical.



- Under a **base-generation account**, this lack of weak crossover effects is unsurprising. As null-operator structures are interpreted via Predicate Abstraction, all that is necessary is that the *tough*-subject be coindexed with the bound pronoun and that the operator be coindexed with its trace:



- Crucially, the operator does **not** need to be coindexed with its associate to achieve the correct interpretation. There is hence no crossover in the lower clause in (46) and (44) is correctly predicted to be grammatical.

⇒ **Long movement accounts**

Special assumptions about weak crossover and/or the relation between the movement steps are required on a long movement account.

5.4 Semantic differences

• **Alleged synonymy**

The main intuition underlying a movement approach to *tough*-constructions is that they are synonymous to the expletive construction. Yet there are cases where this synonymy breaks down. While *tough*-constructions can appear in the **progressive**, their expletive counterpart cannot (Lasnik & Fiengo 1974):

(47) **Progressive in *tough*-constructions only**

- John_i is being easy to please _____i.
- *It is being easy to please John.

- Because our account rests on a semantic difference between the two constructions, it is well-equipped to handle this contrast.

• **Semantics of the progressive**

Partee (1977) suggests that progressive *be* combines with adjectives that can take an animate subject. It then ascribes a certain behavior to this subject:

(48) **Informal denotation for progressive 'be'**

$\llbracket be \rrbracket = \lambda P_{\langle e, st \rangle} \lambda x \lambda w . x$ behaves in a way that $P(x)(w)$

- It follows that the progressive head must apply to individuals and thus necessarily be of type $\langle \langle e, st \rangle, \langle e, st \rangle \rangle$. Consequently, it is incompatible with the expletive construction, which merely denotes a proposition (type *st*).

⇒ **Conclusion: No synonymy**

This account crucially requires the *tough*-frame and the expletive frame to be semantically distinct. It is hence out of reach on a long-movement analysis.

5.5 Predicate sensitivity

- *An apparent disadvantage*

The base-generation account requires two lexical entries for adjectives like *tough*. The long-movement analysis, on the other hand, seems to have the advantage of deriving one frame from the other.

- *More classes of adjectives*

Crucially, there are adjectives that can occur in the expletives but not in the *tough*-construction (e.g., *possible*, *polite*). As (49) shows, what frames an adjective allows is idiosyncratic. It is hence impossible to generally derive one frame from another.

(49) **Adjective classes**

	expletive construction	
	YES	NO
<i>tough</i> -construction	YES <i>tough, impossible, ...</i>	NO <i>pretty, tasty, ...</i>
	NO <i>possible, polite, ...</i>	<i>yellow, heavy, ...</i>

- * *Conclusion*

That *tough* can occur in both has to be explicitly stated under *any* analysis. A movement account is no more elegant than the base-generation analysis.

5.6 Tough-constructions beyond adjectives

- Our account is phrased in terms of semantic properties, not syntactic ones. This leads one to expect parallel facts for **predicates other than adjectives**. This expectation is borne out.

- *Nouns*

Nouns like *pleasure* behave identical to *tough*-predicates:

(50) **Tough-like nouns**

- It is a **pleasure** to visit Reykjavík.
- Reykjavík_{*i*} is a **pleasure** to visit _____{*i*}.

- Just like adjectives, some nouns occur in only one of the two constructions (Lasnik & Fiengo 1974):

(51) **Nouns occurring in *tough*-constructions only**

- *It is a **marvel** to look at Kyle.
- Kyle_{*i*} is a **marvel** to look at _____{*i*}.

(52) **Nouns occurring in expletive construction only**

- It was a **mistake** to fire Bill.
- *Bill_{*i*} was a **mistake** to fire _____{*i*}.

- *PP intervention*

PP intervention effects also arise for these nominals in the *tough*-construction:

(53) a. Mary is a beauty [PP to John].

- Mary_{*i*} is a beauty (*[PP to John]) to look at _____{*i*}.

(54) *Scenario:*

Bill is terrible at math and at risk of failing his math class. His teacher, however, is extremely supportive and goes out of his way to help Bill pass the class. He comes up with all sorts of different teaching techniques to make Bill understand the materials. But nonetheless, it is exceedingly hard for the teacher to make Bill pass the class.

- ?It is a challenge [PP for the teacher] [PP for Bill] to pass the class.
- *This class_{*i*} is a challenge [PP for the teacher] [PP for Bill] to pass _____{*i*}.

- * *Upshot*

Our account extends to *tough*-like nouns and the corresponding intervention facts without further ado. A defective intervention would have to stipulate that PPs, but not DPs, act as defective intervener, a curious conspiracy.

6 Conclusion

- Hartman (2011, 2012a,b) provides evidence that in *tough*-constructions the *tough*-predicate cannot take an experiencer PP and argues that this provides evidence for a long-movement account of *tough*-constructions.
- We have argued that this restriction is part of a larger generalisation: In null operator structures (*tough*-constructions, *pretty*-predicate, GDP), no adjunct

can appear between the adjective and the infinitival clause. This larger pattern remains largely unaccounted for on a long-movement account.

- We proposed a base-generation account of *tough*-constructions that allows for a more comprehensive account of the intervention facts: In *tough*-constructions, an intervening adjuncts creates an unresolvable type mismatch.
- This account derives, without further machinery, several other well-known properties of *tough*-constructions.
- Intervention effects are not necessarily the result of processes in the syntax, but can follow from the semantic incompatibility of two constituents.

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- Abels, Klaus. 2007. Towards a restrictive theory of (remnant) movement. In *Linguistic Variation Yearbook 7*, ed. Jeroen van Craenenbroeck & Johan Rooryck, 53–120. Amsterdam: John Benjamins.
- Akmajian, Adrian. 1972. Getting tough. *Linguistic Inquiry* 3:373–377.
- Bhatt, Rajesh, & Roumyana Izvorski. 1997. Genericity, implicit arguments and control. In *Proceedings of SCIL 7*. Cambridge, MA: MITWPL.
- Bhatt, Rajesh, & Roumyana Pancheva. 2006. Implicit arguments. In *The Blackwell companion to syntax*, ed. Martin Everaert & Henk van Riemsdijk, volume 2, 554–584. Blackwell.
- Brody, Michael. 1993. θ -theory and arguments. *Linguistic Inquiry* 24:1–23.
- Bruening, Benjamin. 2014. Defects of defective intervention. *Linguistic Inquiry* 45:707–719.
- Chomsky, Noam. 1964. *Current issues in linguistic theory*. The Hague: Mouton.
- Chomsky, Noam. 1973. Conditions on transformations. In *A festschrift for Morris Halle*, ed. Stephen Anderson & Paul Kiparsky, 232–286. New York: Academic Press.
- Chomsky, Noam. 1977. On *wh*-movement. In *Formal syntax*, ed. Peter Culicover, Thomas Wasow, & 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, MA: MIT Press.
- Epstein, Samuel. 1984. Quantifier-*pro* and the LF representation of PRO_{arb}. *Linguistic Inquiry* 15:499–505.

- Fleisher, Nicholas. to appear. Rare-class adjectives in the *tough*-construction. To appear in *Language*.
- Hartman, Jeremy. 2011. Intervention in *tough*-constructions. In *Proceedings of the 39th Meeting of the North East Linguistic Society (NELS 39)*, ed. Suzi Lima, Kevin Mullin, & Brian Smith, 387–397. Amherst, MA: GLSA.
- Hartman, Jeremy. 2012a. (Non-)Intervention in A-movement: Some cross-constructural and cross-linguistic consequences. *Linguistic Variation* 11:121–148.
- Hartman, Jeremy. 2012b. Varieties of clausal complementation. Doctoral Dissertation, MIT, Cambridge, MA.
- Hicks, Glyn. 2009. *Tough*-constructions and their derivation. *Linguistic Inquiry* 40:535–566.
- Hornstein, Norbert. 2001. *Move! A minimalist theory of construal*. Oxford: Blackwell.
- Lasnik, Peter. 2005. Context dependence, disagreement, and predicates of personal taste. *Linguistics and Philosophy* 28:643–686.
- Lasnik, Howard, & Robert Fiengo. 1974. Complement object deletion. *Linguistic Inquiry* 5:535–571.
- Lasnik, Howard, & Timothy Stowell. 1991. Weakest crossover. *Linguistic Inquiry* 22:687–720.
- Lebeaux, David. 1984. Anaphoric binding and the definition of PRO. In *Proceedings of the 14th Meeting of the North East Linguistic Society (NELS 14)*, ed. Charles Jones & Peter Sells, 253–274. Amherst, MA: GLSA.
- Lees, Robert B. 1960. A multiply ambiguous adjectival construction in English. *Language* 36:207–221.
- Nissenbaum, Jon. 2000. Investigations of covert phrase movement. Doctoral Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- Partee, Barbara. 1977. John is easy to please. In *Linguistic structures progressing*, ed. Antonio Zampolli, 281–312. Amsterdam: North Holland.
- Postal, Paul. 1971. *Cross-over phenomena*. New York: Holt, Rinehart and Winston.
- Postal, Paul. 1974. *On raising*. Cambridge, MA: MIT Press.
- Postal, Paul, & John R. Ross. 1971. \bar{t} Tough movement si, tough deletion no! *Linguistic Inquiry* 2:544–546.
- Rezac, Milan. 2006. On tough-movement. In *Minimalist essays*, ed. Cedric Boeckx, 288–325. Amsterdam: John Benjamins.
- Rosenbaum, Peter S. 1967. *The grammar of English predicate complement constructions*. Cambridge, MA: MIT Press.
- Ross, John R. 1967. Constraints on variables in syntax. Doctoral Dissertation, MIT, Cambridge, MA.
- Stephenson, Tamina. 2007. Towards a theory of subjective meaning. Doctoral Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- Stephenson, Tamina. 2010. Control in centred worlds. *Journal of Semantics* 27:409–436.
- Williams, Edwin. 1983. Semantic vs. syntactic categories. *Linguistics and Philosophy* 6:423–446.