

# Attitudinal Intervention

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*Abstract.* This paper offers a novel account of intervention effects observed in the tough-construction. I show certain cases of apparent syntactic intervention arise in the presence of a judge argument (Lasnik, 2005), which I formally identify as an attitude holder. I offer an explanation for intervention effects that captures them under a semantic constraint on antecedent-gap chains: links in a chain are "intensionally equivalent," in that every link in a chain must evaluate to the same extension. I illustrate how the intervention effects observed in the tough-construction are reduced to this fundamental principle for antecedent-gap chains, formally capturing a range of data. The account is superior to a purely syntactic analysis of intervention in the tough-construction in that it doesn't rely on ad hoc stipulations.

Keywords: [4-6]

*Tough*-construction; intervention; intensionality; judge-dependence; attitude ascriptions

## 1.0 Introduction: Chain uniformity

In this article I address the minimal pair in (1), an example of the *tough*-construction. I wish to explain why the antecedent-gap chain in (1a) is unavailable in (1b).

- (1) a. Mary is important to talk to *e*.  
b. \* Mary is important to John to talk to *e*.

We call the effect in (1b) intervention, or more technically *defective intervention* as in (Chomsky, 2001), as the presence of John between the subject and gap renders this sentence ungrammatical. All current analyses of (1b) seek to reduce the intervention effects to a result of some syntactic mechanism, where the presence of John either directly (Řezáč, 2006) or indirectly (Hartman, 2011, 2012) disrupts the chain created by the subject and the gap.

In this paper, I propose an alternative explanation to a syntactic account for intervention in the *tough*-construction. I reduce the ungrammaticality of (1b) to a general constraint on how we interpret chains, rather than how we form chains in the syntax. Simply put, I claim that what renders (1b) bad is that it involves a syntactic object that is being evaluated "across" an intensional operator like the one I show to be associated with adjectives like *important*. I propose that in certain cases, this violates a general

constraint on uniformity, which I call *Intensional Chain Uniformity*.

(2) *Intensionality Chain Uniformity* (informal version)

Every link in an antecedent-gap chain which crosses an intensional operator must evaluate to the same *extension*.

I build this proposal by expanding on the data in (1). What we find in the larger set of examples is that intervention effects like in (1b) only arise in the presence of an attitude holder, that is, someone who holds a belief. Along the way, I will illustrate that an account that tries to explain (1b) as a constraint on syntax proper is insufficient. Only the semantic constraint argued for truly explains the data. The empirical payoff is that it predicts contexts where intervention effects arise even without a syntactic intervener, as well as contexts where intervention effects are obviated just in case the intervener doesn't constitute an intensional "shift."

I'll start in section 2 by giving a brief overview of how different syntactic explanations for the difference in grammaticality in (1). As the data presented later argues generally against all syntactic accounts, I will keep this section fairly superficial. In section 3, I lay out the core set of relevant facts, in particular, I show that *tough*-predicates are subjective, and can be modeled as being *judge-dependent*, adopting freely from (Laserson, 2005; Stephenson, 2007; Pearson, 2013). I make the additional claim that judge arguments are attitudinal elements, meaning that we attribute to them a belief. We can, and should, ascribe to *tough*-predicates a semantics just like any other intensional predicate, e.g. *want*.

Since there has been some confusion about what exactly gives rise to intervention in the *tough*-construction, I spend some time in section 4 establishing that judges are the culprit for intervention effects in the *tough*-construction, not, say, the presence of a clausal CP layer, or a syntactically similar "experiencer" argument. I will reinforce the observation by examining a range of constructions which are similar to the *tough*-construction, illustrating that judges, or in general, attitude holders, cannot appear between the subject and the gap but non-attitude holders are acceptable. Finally, to drive home the point that it's the attitudinal nature of the judge, not, say, the syntactic position of the judge that leads to ungrammaticality, I'll discuss a structurally unrelated construction, Raising-to-Object/ECM, which has also

been argued in (Hartman, 2011, 2012) to exhibit similar intervention effects. Here we'll see again that the relevant factor for intervention is being attitudinal.

I will formalize my proposal in section 5, invoking recent theories concerning de re semantics from (Percus and Sauerland, 2003, Anand, 2006) and (Percus, 2013). I will address why the so-called attitudinal intervention effects apparent in (1b) only appear in configurations like the *tough*-construction and Raising-to-Object, but not cases of antecedent-gap chains which involve *wh*-movement over an attitude holder, or Subject-to-Subject Raising. I illustrate that the *tough*-construction differs empirically in being an “intensional island”. Each link in the antecedent-gap chain must be evaluated in its local intensional domain. I hypothesize that this is due to the fact they are unique in English in being cases where the syntactic object is, at least descriptively, thematically associated with two positions. The remainder of the paper will address a prediction made by my account, which is that intervention effects can be obviated just in case the intervener doesn't constitute an intensional “shift.” I will show how this is borne out in two cases: psych-verbs and corpus examples of the *tough*-construction.

## **2.0 A brief review of syntactic accounts of intervention**

There are a number of proposals that have attempted to account for the distinction in (1). They can broadly be categorized into two camps.

1. The intervener directly disrupts the formal link between the subject and the gap (Řezáč, 2006; Hicks, 2009). In this proposal, the intervener blocks the formal relationship, e.g., Agree (as in (Chomsky, 2000, 2001)) from linking the subject with the gap.
2. The intervener disrupts the c-command relationships (Hartman, 2011, 2012; Bruening, 2014). In this solution, the intervener indirectly causes there to be a problem by making certain c-command relations no longer available. (Note that Bruening's solution isn't formalized, although this is what is suggested.)

Without singling out any particular theory, I argue broadly against all such syntactic accounts. This is the

gist of my argument: Any syntactic account is expected to operate systematically. As long as the structural conditions are met, that is, there is a structural intervener between the subject and the gap, we expect to find intervention effects. I will show that this is simply not the case. There are a number of cases of syntactic interveners in the *tough*-construction and similar which are perfectly grammatical. The empirical results force us to consider exactly which syntactic interveners lead to intervention effects. I will conclude that there is no natural class based on syntactic criteria, but there is a semantic generalization: Only attitude holders are interveners in the *tough*-construction. Indeed, I will show that such intervention effects are detectable even outside of the *tough*- construction.

Now, we could always complicate any syntactic solution by relativizing the intervention effects to attitude holders. This could be achieved by stipulating a feature on attitude holders, or claiming that they occupy a certain syntactic position. (Actually, I will show that a structural solution is not plausible.) While this could be made to achieve the empirical results, I wish to go beyond this and attempt to give a more explanatory account. Why attitude holders, and not, say, experiencers, or, deixis centers? The solution I propose is that because we attribute to attitude holders a belief, this has effects on interpreting any antecedent-gap chain that crosses an attitudinal domain, because the chain is evaluated in potentially two different belief domains. Indeed, I will show that this constraint is generally operative, but only truly detectable in certain configurations, one of which is the *tough*-construction.

### 3.0 *Tough*-predicates are subjective

The *tough*-construction is one instance among a fairly large class of constructions which license a certain type of antecedent-gap relation.<sup>1</sup> The core descriptive characteristics of this chain is that it displays properties of an A'-step in an infinitival clause (a *for*-CP), but the head of the chain is in a A-position in the main clause (Chomsky, 1977, Browning, 1987, Jones, 1991).

- (3) a. Mary is important to talk to *e*. *tough*-construction

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<sup>1</sup> There is a broad divide among (3) as to predicates which also permit an expletive subject, and those which do not. I will have nothing to say here about this distinction. I focus instead on the fact that the antecedent-gap chain that exists in all of the constructions is identical, all else equal.

b. This book is a pleasure to read <i>e</i> .	<i>tough</i> -nouns
c. Mary is pretty to look at <i>e</i> .	<i>pretty</i> -class adjs
d. This table is light enough to lift <i>e</i> .	<i>enough</i> Deg
e. This table is too heavy to lift <i>e</i> .	<i>too</i> Deg
f. This table costs \$100 dollars to buy <i>e</i> .	<i>cost</i>
g. This book took a week to read <i>e</i> .	Take-TIME
h. War frightens me to think about <i>e</i> .	psych-verbs
i. ...?	

The class of *tough*-predicates largely overlaps with the class of predicates that are called *subjective* (Kölbel, 2004; Sæbo, 2009; Kennedy, 2012). Subjective expressions, at least descriptively, appear to have different standards of truth than non-subjective expressions. For instance, they exhibit *faultless disagreement*, where two individuals can make apparently contradictory assertions, but neither one is judged as lying. With the non-subjective adjective *vegan* in (4), objectively either Mary or John has said something untrue. But with the subjective adjectives in (5), both Mary and John can be said to be speaking truthfully because they both perceive the state-of-affairs in a different way.

(4) a. Mary: “This cake is vegan.”

b. John: “No, this cake is not vegan.”

(5) a. Mary: “This book was difficult/easy/important/impossible/fun/. . . to read.”

b. John: “No, this book was not difficult/easy/important/impossible/fun/. . . to read.”

Similarly, (Kennedy, 2012) observes that subjective elements can be embedded under *find* in a small clause, while non-subjective elements cannot.<sup>2</sup>

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<sup>2</sup> It’s worth noting that while the correlation between subjectivity and these sorts of chains is robust, it is apparently not exceptionless, as the Take-TIME Construction and *cost* are not (obviously) subjective in the same way. Based on cross-linguistic evidence, I suspect that even these will turn out to be at least partially subjective. In any event, I will not explore here the connection between subjectivity and these sorts of

(6) # I find this cake vegan.

(7) I find this book difficult/easy/important/impossible/fun/. . . to read.

Lasersohn (2005) proposes to model subjectivity in Predicates of Personal Taste (PPTs) as *judge dependence*. We evaluate the truth of a proposition containing a subjective element relative to a judge parameter. Simplifying, Lasersohn predicts the following truth conditions for PPTs (8) and, by extension, *tough*-predicates (9).

(8)  $[[\text{This cake is tasty}]]^{w,j} = 1$  iff According to  $j$ , this cake is tasty in  $w$ .

(9)  $[[\text{It is important to talk to Mary}]]^{w,j} = 1$  iff According to  $j$ , talking to Mary is important in  $w$ .

In this way, we get the fact that the truth is relative to an individual. Pearson (2013), building off of Stephenson's (2007) proposal that the judge is an argument of the PPT, argues further that the judge isn't a parameter of evaluation, rather, it is syntactically represented in the left periphery by an operator. For her, the LF and truth conditions are closer to (10) and (11):<sup>3</sup>

(10) a. [ Op<sub>1</sub> This cake is [ tasty x<sub>1</sub> ] ]

b.  $[[\text{(10a)}]]^w = 1$  iff According to SPEAKER in  $w$ , this cake is tasty in  $w$ .

(11) a. [ Op<sub>1</sub> It is [ important x<sub>1</sub> ] to talk to Mary ]

b.  $[[\text{(11a)}]]^w = 1$  iff According to SPEAKER in  $w$ , talking to Mary is important in  $w$ .

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antecedent-gap chains.

<sup>3</sup> Pearson also models PPTs as being generically speaker-oriented. This additional issue won't concern me here, but it can be added into the analysis with further assumptions and complications.

One key aspect of Pearson’s proposal is that she adopts something like the *Performative Hypothesis*, in which a truthful speech act of utterance P functionally commits the speaker to the belief that P. Simplifying, a clause is a property of individuals, which is predicated of the speaker. This gives her a way to model the speaker-orientation, as well as properties of how this orientation can shift in embedded contexts. I take Pearson’s analysis as a starting place for the analysis of *tough*-predicates.

I’d like to make one thing explicit that I think has been at least implicitly assumed in the literature: Judges are attitudinal, that is, at least in the *tough*-construction, we attribute to the judge a belief about the world. For instance, using the classic de re/de dicto ambiguity test, we observe that unambiguous judges give rise to de dicto readings in (12).

- (12) a. It’s important to John to meet the president (but he doesn’t want to meet Trump).  
 b. It’s amusing to John to ride a unicorn (although, we all know unicorns don’t exist).  
 c. It’s inappropriate to John to marry a plumber (but not a carpenter).

We would like the meaning postulated in (11) to be able to capture attitude ascriptions as well as judge-dependence. Observe that *tough*-constructions can now be thought of as relations via a predicate between an attitude holder (the judge) and an embedded proposition (the infinitival clause). Seen in this way, they are similar to more “traditional” intensional verbs, like *want*. It seems reasonable to give *tough*-predicates a semantics like that of other more widely studied intensional predicates. Being adjectives, *tough*-predicates are simply mapped to a slightly different syntax than verbs. Indeed, if we assume that intensional predicates all share a core semantic basis, then we *should* ascribe to *tough*-predicates a similar analysis. I’ll assume that they involve Hintikka quantification over worlds ordered relative to some predicate-specific ordering source, e.g., IMPORTANCE, DIFFICULTY, EASINESS... (Note that I’m rearranged some of the pieces to conform with a more standard syntax in which the intensional predicate combines with its clausal argument before its attitude argument. I assume that (well-motivated) movements derive the surface order.)

- (13) a.  $[[\text{important}]]^w = \lambda P_{\langle s,t \rangle} \lambda x_e. \forall \langle x', w' \rangle \in \text{IMP}_{x,w}, P(w') = 1$  where,

$IMP_{x,w}$  is a subset of the  $x$ 's doxastic alternatives<sup>4</sup> in  $w$  which conform to what  $x$  takes to be important in  $w$ .

b. [  $Op_1$  it is [ (to)  $x_1$  important [  $\lambda_2$  to talk- $w_2$  to Mary ] ]

c. [[ (13b) ]]<sup>w</sup> = 1 iff  $\forall \langle x', w' \rangle \in IMP_{\text{spkr}, w}$ ,  $x'$  talks to Mary in  $w' = 1$

Complications aside, some of which will be addressed later, I take it that this is a reasonable semantics for *tough*-predicates.<sup>5</sup> We can at this point ask how *tough*-“movement” is accomplished. That is, what analysis of the antecedent-gap chain do I assume given the semantic assumptions? There are two choices: movement, i.e., the subject is derived by moving out of the infinitival clause, or predication, i.e., the subject is generated in the matrix clause and related to a variable in the infinitival clause. Although this question has dominated the discussion of the *tough*-construction (cf (Chomsky, 1977) and subsequent for predication-based approaches vs. (Chomsky, 1981) and subsequent for movement-based approaches), it turns out that the issue is actually orthogonal to the proposal I make below. I could choose either a movement or predication analysis and the result would be the same for my proposal to derive the intervention effects. But I do think that the evidence is in favor of treating the chain as not being formed by movement. For simplicity, I will assume that the structure involves generating the subject in the matrix clause as a topic and having a coindexed silent pronoun in the lower clause. This is a much simplified version of (Řezáč, 2006).

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<sup>4</sup> I'll assume that the doxastic alternatives are centered worlds, and  $x'$  is the de se self for  $x$  in  $w'$ .

<sup>5</sup> One complication that will not be addressed here is whether *tough*-predicates are always quantifiers over worlds. This becomes relevant when there is no embedded clause, e.g., *Mary is important*. I'm also going to ignore how control is established between judge and the PRO subject of the lower clause. Since I adopt centered worlds, I will assume that the de se center is PRO.

(i) The mission was important/difficult/easy/impossible/fun/. . . to/for John

See (Gluckman, 2017) for an analysis that can capture these facts within an intensional framework. A second complication is whether having the set of worlds be a subset of the doxastic alternatives is the correct choice. Grano (2015) suggests that these types of infinitival clauses all involve Portner's (2009) PRIORITY modality, in which case the relevant set of worlds might more accurately be described as a CIRCUMSTANTIAL modal base. These are important points to investigate, but are not directly relevant to the discussion below, so I will put them aside here. A final complication concerns how control of PRO is established. Here again, I'll put aside this issue, as it doesn't directly impact the discussion later.



- (14) a. Mary is important to talk to *e*.  
 b. [ Op<sub>1</sub> Mary λ<sub>2</sub> is [ x<sub>1</sub> important [ λ<sub>3</sub> to talk-w<sub>3</sub> to *pro*<sub>2</sub> ] ]  
 c. [[(14b)]]<sup>w</sup> = 1 iff Mary has the property such that  $\forall \langle x', w' \rangle \in \text{IMP}_{\text{spkr}, w}$  x' talks to her in w' = 1

Again, the question of how the antecedent-gap chain gets formed is not crucial to the proposal below. I adopt (14b) in part because it seems to me at least close to the correct analysis, but it also happens to be the simplest set of assumptions given the semantic complications I introduce later.

#### 4.0 PP ambiguities: Judges and subjects

A persistent issue that crops up in the literature on the *tough*-construction concerns the syntactic/semantic role of the prepositional phrase between the adjective and *for*-CP. The discussion concerns whether the prepositional phrase is a judge<sup>6</sup> or the subject of the infinitive. In the former case, the judge is syntactically part of the matrix clause (and controls PRO). In the latter case, the subject of the *for*-CP is syntactically and semantically an argument of the infinitive, and remains inside of the CP clause. It's important to differentiate between these two structures because they are syntactically distinct, as shown below, and moreover, there's a debate in the literature about which one is the culprit for intervention effects.

- (15) It was difficult for John to read this book.  
 a. It was [ difficult for John ] PRO to read this book *Judge*  
 b. It was difficult [ for John to read this book ] *For-CP Subject*

It's my goal in this part of the paper to find ways to differentiate between this ambiguity. Once we distinguish between the two structures (and a third discussed in section 4.1), we find that only the judge

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<sup>6</sup> In the syntax literature, this is often called the Experiencer argument, although I retain this label for a different argument of the adjective.

gives rise to intervention effects.

Hartman (2011, 2012) addresses the debate between the structures in (15) and establishes a number of diagnostics for differentiating between the two positions. The most notable is that some *tough*-predicates license their Judge argument with idiosyncratic prepositions. Indeed, until now I've been tactfully using *tough*-predicates which license the Judge with *to*.<sup>7</sup>

- (16) a. It's [ important/amusing/annoying/dumb/disgusting to John ] PRO to read this book.  
≈ "According to John, reading this book is . . ."
- b. It's important/amusing/annoying/dumb/disgusting [ for John to read this book ]  
≈ "According to the speaker, John reading this book is . . ."

The second diagnostic introduced by Hartman concerns scope. The judge reading is compatible with a high scope reading, presumably because the adverb and the DP quantifier are clausemates. A quantifier inside of the *for*-CP cannot escape the clause. (See further discussion in section 5.) Adding an overt judge in (17b) facilitates the desired reading.

- (17) a. It's difficult for many students to pass the exam.  
*possible meaning* (many>difficult): Many students are such that it's difficult for them to pass the exam.
- possible meaning* (difficult>many): the difficult thing is for many students to pass the exam.
- b. It's difficult for John for many students to pass the exam.  
~~*possible meaning* (many>difficult): Many students are such that it's difficult according to John for them to pass the exam.~~
- possible meaning* (difficult>many): the difficult thing, according to John, it for many students to pass the exam.

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<sup>7</sup> I am very aware that there is a great deal of speaker variation as to which predicates can appear with their judge licensed by *to*.

In addition to these two diagnostics from Hartman, I include two of my own. The third concerns partial binding. A judge argument can partially bind a PRO subject.

- (18) a. It's [ difficult for John<sub>i</sub> ] PRO<sub>i+</sub> to meet at 7pm.  
b. It's [ easy for John<sub>i</sub> ] PRO<sub>i+</sub> to gather at the park.  
c. It's [ fun for John<sub>i</sub> ] PRO<sub>i+</sub> to work as a team.

The preposition phrases in (18) must introduce a judge. Finally, judges are animate, in fact, fully sentient.<sup>8</sup>

- (19) a. It's difficult [ for a tree to grow leaves in winter ]  
b. It's annoying [ for rain to seep through the roof ]

The sentence requirement makes sense if judges are attitudinal. We can only attribute beliefs to entities that can think.

The importance of making the distinction between judges and subjects of the infinitive is that once we control for the ambiguity, we can see that the subject of the clause is not the culprit of the intervention effects.

- (20) a. \* This book is important to Mary to read *e*.  
b. The exam is difficult for many students to pass *e*.  
~~*possible meaning* (many > difficult): Many students are such that it's difficult for them to pass the exam.~~  
*possible meaning* (difficult > many): The difficult thing is for many students to pass the exam.  
c. \* The park is difficult for John to gather at *e*.  
d. New leaves are difficult for a tree to grow *e* in winter

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<sup>8</sup> There is perhaps an issue of metonymy for the examples in (19). Nonetheless, to the extent that a tree, etc can be judge, then I will predict that in such circumstances, it is an intervener as well (although see the discussion in the next section concerning the distinction between experiencers and judges.)

So far, this has merely demonstrated that the argument outside of the *for*-CP gives rise to intervention effects. This is not a new observation (Hartman, 2011, 2012; Bruening, 2014). But the claim I make below is that only certain elements outside of the *for*-CP are interveners. In particular, *attitude holders* are interveners in *tough*-construction. Because judges are attitudinal, they are interveners. In the following sections, I will illustrate cases where intervention effects do and do not occur with potential interveners, that is, with elements that syntactically sit between the subject and the gap which are outside of the *for*-CP. In this expanded dataset, we will observe that the semantic role, not just the syntactic position, matters for intervention effects.

#### 4.1 PP ambiguities: Experiencers and judges

The first case to consider is another ambiguity for the prepositional phrase following the *tough*-predicate. The argument of the preposition can be interpreted as an experiencer, rather than a judge. This reading can be easily brought out in (21b), where the infinitival clause is preposed, forcing the prepositional phrase to be an argument of the adjective. But here, the salient reading doesn't attribute a thought to the baby, rather, it's an experiencer argument.

- (21) a. It was difficult for the baby to grip the bottle.  
b. To grip the bottle was difficult for the baby.

In (21b), the most natural reading is that the baby experiences a difficulty. So we could paraphrase (21a) as "The baby has difficulty gripping the bottle." But it's not necessarily the case that the baby believe anything about gripping the bottle. The following illustrate additional, less ambiguous examples. Note that these experiencers are licensed by the preposition *to*.

- (22) a. It's harmful to the environment to burn plastic.

- b. It would be damaging to the company to reveal the corruption.
- c. It's important to our community to support this bill.

I take the experiencer argument to also be an argument of the adjective, but crucially, it is not a judge. Indeed, the judge of (21) and (22) is the speaker.<sup>9</sup> Finally, we observe that experiencers are perfectly acceptable as interveners.

- (23)
- a. Plastic is harmful to the environment to burn *e*.
  - b. The corruption would be damaging to the company to reveal *e*.
  - c. This bill is important to our community to support *e*.

Note that *important to* and *damaging to* are ambiguous. The following contexts and minimal pairs illustrate that when we bias the intervener towards a judge interpretation, grammaticality degrades.

(24) *Senator Smith has proposed a bill that would greatly improve neighborhood safety. He thinks this bill is a necessary step in helping the community, as does everyone who lives in the neighborhood.*

- a. This bill is important to our community to support *e*.
- b. \* This bill is important to Senator Smith to support *e*.

(25) *A manager of a large corporation has worked for her company for many years when she comes*

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<sup>9</sup> I will point out that it's arguable whether harmful is a subjective predicate like the other *tough*-predicates. It doesn't seem to pass the find test very well, and I think we can objectively discover what is and is not harmful.

- (i) ?? I find burning plastic harmful to plants.

However, it's possible that harmful is ambiguous between being merely vague and being evaluative, using Kennedy's terminology. The vague reading might be simply preferred over the evaluative for independent reasons. It seems to me that when the context is such that *harmful* is evaluated less objectively, then it improves.

- (i) ? I find flights like that harmful to my health because they make me so airsick.

*across a massive network of corruption that she thinks would destroy the company if it came out.*

- a. The corruption would be damaging to the company to reveal *e*.
- b. \* The corruption would be damaging to the manager to reveal *e*.

The empirical observation is that an antecedent-gap chain in the *tough*-construction is sensitive to the semantic role of the intervening prepositional phrase. Experiencers are permitted, but judges are not.

Now, one response might be to make a syntactic distinction: experiencers do not syntactically intervene, and thus they wouldn't count as interveners for an antecedent-gap chain anyway. This reduces to a claim about c-command: experiencers do not c-command into the infinitival clause, and thus don't disrupt the relationship between the subject and the gap. I think that the evidence is equivocal on this front. On the one hand, experiencers do permit apparent Condition C violations, but on the other they can also bind variables in the lower clause and are interveners for wh-movement.

- (26)
- a. It's harmful to him<sub>i</sub> for John<sub>i</sub> to smoke so much.
  - b. It's damaging to no company<sub>i</sub> to reveal its<sub>i</sub> corruption.
  - c. \* What is it important to who to support?

More importantly, it seems to me that if we tried to argue that experiencers didn't c-command into the infinitival clause, and we explained away the data in (26b), (26c) by some other mechanism(s), then we could equally claim the same about judges, in which case we are still left with the problem of why the semantic role should matter for intervention effects.

Alternatively, perhaps judges occupy a syntactic position that forces the *for*-CP to move above the subject. From this extraposed position the gap is no longer c-commanded, and hence no longer bound by the subject. Such an analysis has been suggested in Bruening (2014).

- (27)
- a. [ [ [ It was important  $t_{CP}$  ] to John ] [<sub>CP</sub> to talk to Mary ] ]
  - b. \* [ [ [ Mary<sub>i</sub> is important  $t_{CP}$  ] to John ] [<sub>CP</sub> to talk to  $e_I$  ] ]

However, even if this is the structure we assign, it's still the case that variables inside of the *for*-CP can be interpreted below the judge, and hence below the position that subject sits in.

(28) It was important to no child<sub>i</sub> for her<sub>i</sub> parents to chaperone her<sub>i</sub> dance.

As such, there is no reason to suppose that Bruening's extraposition account is correct for judge intervention.<sup>10</sup> In short, an explanation that tries to reduce the ungrammaticality of the original example in (1b) to a syntactic mechanism must also be able to account for the grammaticality of similar situated non-judge arguments. Attempts to reduce judge-intervention to a syntactic mechanism are, at best, highly stipulative.

#### 4.2 The Take-TIME Construction

Recall in the list of constructions in (3) related to the *tough*-construction, I included the Take-TIME Construction (TTC). Little formal work has addressed this construction, though it is sometimes mentioned in passing in the literature on the *tough*-construction (Jones, 1991). It is most often employed as a diagnostic for telicity in the aspect literature (MacDonald, 2006).

- (29) a. It took an hour to read this article.  
b. This article took an hour to read *e*.

Descriptively, the TTC bears all the properties we ascribe to the *tough*-construction: an alternation between an expletive and referential subject; a gap with certain A'-properties in the infinitival clause; the apparent contradiction of having an element which is thematically related to two different predicates.

The issue I'd like to focus on here is that the TTC permits what I call a *middle subject*—a descriptive term for the argument that occurs in the middle of the phrase and that is obligatorily construed

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<sup>10</sup> Which is not to say that his explanation might not hold for a different set of facts. It just doesn't hold for judge intervention. See footnote 14.

as the subject of the infinitive.

- (30) a. It took Mary an hour to read this article.  
b. This article took Mary an hour to read *e*.

The first thing to note about middle subjects is that they are perfectly grammatical when there's an antecedent-gap chain. Moreover, middle subjects are unambiguously structural interveners. They syntactically sit between the subject and the gap, c-commanding into the infinitival clause. This is easily verified by any number of c-command tests.<sup>11</sup>

- (31) a. It took no student<sub>i</sub> an hour to finish his<sub>i</sub> homework..  
b. \* What did it take who an hour to read *t<sub>wh</sub>*?

Like the experiencer arguments discussed above, middle subjects are not attitudinal. We do not attribute a belief to them. Indeed, they don't even need to be sentient.

- (32) a. It took John an hour to catch a unicorn (# but there are no unicorns).  
b. It took the rock an hour to roll two feet.

The point here is simple: If we wish to claim that the judge in (33a) disrupts a syntactic relationship between the subject and the gap, then we need to explain why the middle subject in (33b) fails to trigger the exact same effect.

- (33) a. \* This book is important to John to read *e*.

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<sup>11</sup> Note that many tests for c-command are confounded by the presence of PRO in the lower clause, which is itself an argument for c-command. This is an instance of *predicative* control (versus *logophoric* control), diagnosed by the inability to license partial control.

(i) It took John<sub>i</sub> an hour to PRO<sub>i+</sub> gather at the park.  
If Landau (2015) is right, predicative control has a strict c-command requirement (see also Williams 1980).



- b. This book took John an hour to read *e*.

Like in the previous section, from a syntactic point of view, it would be difficult to find a natural class for “successful” and “failed” interveners. A syntactic analysis must be able to differentiate between those structural interveners that are permitted, and those that are disallowed.

### 4.3 Generalized judge intervention

So far we’ve seen that in the *tough*-construction proper, judges---and only judges---give rise to intervention effects. This was confirmed by looking at the TTC, where a non-judge argument intervening between the subject and the gap was perfectly acceptable. Importantly, identical effects can be induced in all the other subjective elements in the list of *tough*-like constructions in (3). For instance, *tough*-nouns can have an overt judge which is not permitted when there’s a gap.

- (34) a. It was a pleasure (to John) to read this book.  
b. This book was a pleasure (\*to John) to read *e*.

And as observed in (Keine and Poole, 2015), judges intervene in *pretty*-class adjectives, which are distinct from *tough*-predicates in not permitting the expletive subject version.

- (35) a. Mary is pretty (\*to John) to look at *e*.  
b. These cakes are tasty (\*to Bill) to eat *e*.

*Too/enough* clauses act the same way. These degree quantifiers can turn a non-subjective predicate into a subjective predicate (XX). Note that we can even have non-judge elements following the adjective (37c) (although I’ll concede that it’s arguable whether we should consider these true syntactic interveners).

- (36) a. John finds the book \*(too) expensive to buy *e*.  
 b. John finds the table clean \*(enough) to eat off of *e*.  
 c. John finds Mary \*(too) angry to talk to *e*.
- (37) a. The book is too expensive(\*to John) to buy *e*.  
 b. The table is clean enough (\*to John) to eat off of *e*.  
 c. Mary was too angry (\*to John) about the homework (\*to John) to talk to *e*.

Indeed, as noted in (Kennedy, 2012), non-subjective predicates can be made subjective (i.e., judge-dependent) simply by modification with a subjective adverb. In this case, judge intervention again appears.

- (38) a. \* This book was long to read *e*.  
 b. This book was surprisingly long (\*to John) to read *e*.

Finally, we can even see similar effects in the TTC when we use more subjective temporal elements. I'll note that there is considerable speaker variation here as whether a judge is allowed.<sup>12</sup>

- (39) a. ? It took forever to John to finish the midterm.  
 b. ? It took an eternity to Mary to hear from the board of admissions.
- (40) a. \* The midterm took forever to John to finish *e*.  
 b. \* The board of admissions took an eternity to Mary to hear from *e*.

To the extent that the examples in (39) are good, then the corresponding examples in (40) are

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<sup>12</sup> Similar examples, with similar caveats about acceptability, can be constructed for *cost*:

- (i) This book costs way too much (\*to John) buy *e*.  
 (ii) This house costs nothing (\*to Mary) to buy *e*.

ungrammatical. The point here is that judges generally intervene, regardless of the structure. This is what I would like to explain: Why judges, and nothing else? That is, it could have been the case that we only see experiencer intervention. Or perhaps only Agents intervene. But this is not what is observed. The empirical fact is that judges have a special status when it comes to intervention in the *tough*-construction and similar.

#### 4.4 Hartman's interveners: Raising-to-Object

So far, I've concentrated on the *tough*-construction and similar, and in particular tried to argue that the judge is the culprit for intervention. I claim that the fact that judges are attitudinal is what creates the problem. In this section I wish to widen the empirical landscape and show that we can detect the effects of "judge" intervention outside of the *tough*-construction. To do this, I'll consider a structure that has similarly been argued in (Hartman, 2011, 2012) to display intervention effects: Raising-to-Object(/ECM) (RtoO) configurations.<sup>13</sup> Descriptively, RtoO isn't possible when the matrix verb has a dative argument.

- (41) a. Mary proved (to Bill) that John was a liar.  
b. Mary proved John (\*to Bill) to be a liar.

(Hartman, 2011, adapted from exx (28)-(29))

- (42) a. Sue demonstrated to Bill that Mary was the killer.  
b. John demonstrated Mary (\*to Bill) to be the killer.

First note that Bill in (41a, 42a) is attitudinal, i.e., we attribute to him a belief about John's being a liar/Mary's being a killer. Indeed, observe that the same effects arise when we use a non-c-commanding attitude holder, and moreover, they fail to arise when the prepositional phrase is not attitudinal.

- (43) a. \* Mary proved the defendant in the judge's opinion to be guilty.

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<sup>13</sup> Hartman discusses two other contexts in English: Raising out of finite complements and raising versions of *promise/threaten*. In fact, I don't not think that these two constructions provide evidence for his claim as they are confounded by independent factors, and so I will leave them aside.

b. Mary proved the defendant yesterday to be guilty.

(Hartman, 2011, ex (27))

(44) a. \* Sue demonstrated Mary according to John to be the killer.

b. Sue demonstrated Mary in court to be the killer.

What these examples show is that any sort of attitudinal shift, even brought about by something that doesn't involve direct c-command of the attitude holder, can lead to apparent "intervention effects."<sup>14</sup> It's worth noting that

A natural question to ask at this point is why attitudinal intervention isn't more prevalent. That is, we only see its effects in constructions like *tough*-construction and RtoO. I will put off this discussion until after I've formalized judge intervention in the next section, but in order to satisfy any curiosity, let me just note that the places where this kind of attitudinal intervention are detectable are precisely those places where it's argued that a single syntactic object occupies two distinct thematic positions.

## 5.0 Intensional Chain Uniformity

Here's the intuition: In the *tough*-construction, it's bad to have an antecedent-gap dependency crossing an attitude holder because each gap gets interpreted relative to a different attitudinal perspective. The chain isn't uniform with respect to intensionality, because the speaker and the explicit judge each have a different "version" of the syntactic object. Note that as stated in this informal version, the constraint is neutral with respect to the theory of attitude ascriptions we adopt, as well as syntactic assumptions about how the antecedent-gap chain is formed. I stipulated above that I would treat the antecedent-gap chain as something akin to pronominal binding, but we would get the same result if we assumed there was actual *tough*-

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<sup>14</sup> The same test involving a non-commanding attitude holder is somewhat moot for the *tough*-construction because, as observed in (Bruening, 2014), any sort of adjunct leads to intervention effects.

(i) \* Mary was important according to John/yesterday to talk to *e*.  
It seems plausible that Bruening's extraposition account, which we've observed is insufficient for judge intervention, can apply to the facts here. As evidence, I'll note that when the adjunction is low, intervention effects go away.

(ii) Mary was more important than Bill to talk to *e*.

movement. The reason is that the constraint I propose is concerned with the entire syntactic object, that is, the antecedent and any-and-all gaps that covary with it, however they are formed.

That said, let me lay out some assumptions that will form the basis of a formal account. First, let's remind ourselves of the semantics for *tough*-predicates from earlier. I treated these on par with other intensional predicates like *want* in having them be quantifiers over worlds. I also assumed that the gapped version is the result of generating the subject in the matrix clause and having it bind a pronominal variable in the infinitival clause.

(45) a.  $[[\text{important}]]^w = \lambda P_{\langle s,t \rangle} \lambda x_e. \forall \langle x', w' \rangle \in \text{IMP}_{x,w}, P(w') = 1$  where,

$\text{IMP}_{x,w}$  is a subset of the  $x$ 's doxastic alternatives in  $w$  which conform to what  $x$  takes to be important in  $w$ .

b.  $[ \text{Op}_1 \text{ Mary } \lambda 2 \text{ is } [ \text{(to) } x_1 \text{ important } [ \lambda 3 \text{ to talk-}w_3 \text{ to } pro_2 ] ] ]$

c.  $[[\text{(42b)}]]^{c,w} = 1$  iff Mary has the property such that  $\forall \langle x', w' \rangle \in \text{IMP}_{\text{spkr},w}, x'$  talks to her in  $w' = 1$

However, I now want to talk about “versions” of individuals, and so I need to enrich my semantics to be able to handle how we think about individuals in belief worlds. To this effect, I will employ acquaintance-based concept generators (Percus and Sauerland, 2003; Anand, 2006; Charlow and Sharvit, 2014). Acquaintance-based concept generators are proposed as a way to formally capture de re readings without appealing to the conceptually and empirically difficult mechanism of res-movement (Heim, 1994). Conceptually, every res-argument under an intensional operator comes wrapped in a function mapping the res to its “individual-concept.” The concept generator is assumed to be a pronoun bound by the intensional predicate. I assume the following denotation for a suitable concept generator from (Percus, 2013).

(46) *Acquaintance-Based Concept Generator* (Percus, 2013, p. 7)

A function  $G$  of type  $\langle e, \langle s, e \rangle \rangle$  is an acquaintance-based concept generator for an attitude holder  $x$  in world  $w$  iff,

a. the domain of  $G$  is made up of individuals who  $x$  is acquainted with in  $w$ , and

b. for all  $y$  in the domain of  $G$ ,  $G(y)$  is a concept via which  $x$  represents  $y$  to himself in  $w$ —a function from worlds to individuals.

A crucial component of the concept generator is that individual-concepts, i.e., definite descriptions of individuals, are acquaintance-based. As this will be important below, let me take a moment to explicate this further. The Quinean view of belief-reports is that there's a relation between an attitude holder and the individual(s) that the attitude has a belief about. *John believes that Mary left* means, more or less, "John has some way of describing Mary to himself such that he believes of this description that she left." Concept-generators are one way of formalizing this relationship between attitude holders and res arguments. They map an attitude holder to an individual-concept in a world for a particular res. For some concept generator  $G$  for John in world  $w$ ,  $G(\text{Mary})(w')$  returns a definite description of Mary in  $w'$  accessible from  $w$ —in particular, the description that John has for Mary in  $w'$ . This could be, say, "the woman John saw walking a dog," or "the girl that he hears singing every morning," or any other way that John might know Mary. Importantly, the relations are acquaintance-based because John must have, fundamentally, learned the description somehow, say, through seeing Mary, or hearing her, or reading about her, etc.

Adding acquaintance-based concept generators to the denotation for a *tough*-predicate gives us (47).

(47)  $[[\text{important}]]^w = \lambda P \lambda x$ . There's an acquaintance-based concept generator  $G$  for  $x$  in  $w$  such that  $\forall \langle x', w' \rangle \in \text{IMP}_{x,w}$ ,  $P(G)(w') = 1$  where,

$\text{IMP}_{x,w}$  is a subset of the  $x$ 's doxastic alternatives in  $w$  which conform to what  $x$  takes to be important in  $w$ .

This revised version of *tough*-predicates now predicts the LF and truth conditions in (48b,c).

(48) a. It's important to talk to Mary.

b.  $[ \text{Op}_1 \text{ It is } [ (\text{to}) x_1 \text{ important } [ \lambda_2 \lambda_3 \text{ to talk-}w_3 \text{ to } G_2(\text{Mary})(w_3) ] ] ]$

c.  $[[\text{(45b)}]]^w = 1$  iff There's an acquaintance-based concept generator  $G$  for the speaker in  $w$  such that  $\forall \langle x', w' \rangle \in \text{IMP}_{\text{spkr},w}$ ,  $x'$  talks to  $G(\text{Mary})(w') = 1$

What are the truth conditions of (48b)? It maps to true just in the case that, for the speaker to talk to the person he thinks is Mary is important to the speaker. In the presence of an overt judge, things are only minimally different.<sup>15</sup>

(49) a. It's important to John to talk to Mary.

b. [ Op<sub>1</sub> It is [ to John important [ λ<sub>2</sub> λ<sub>3</sub> to talk-w<sub>3</sub> to G<sub>2</sub>(Mary)(w<sub>3</sub>) ] ] ]

c. [[ (45b) ] ]<sup>w</sup> = 1 iff There's an acquaintance-based concept generator G for **John** in w such that  $\forall \langle x', w' \rangle \in \text{IMP}_{\text{John}, w}, x' \text{ talks to } G(\text{Mary})(w') = 1$

What are the truth conditions of (49b)? This maps to true just in the case that, for John to talk to the person he thinks is Mary is important to John. In this way we can build de re semantics into the account of *tough*-predicates outlined earlier. Note that this parallels what we do with any intensional predicate, e.g., *believe*, *want*, etc.

With these assumptions in place, let me formally state the intuition from earlier. *Intensional Chain Uniformity* proposes that every link in a chain must evaluate to the same extension, given a general notion of an assignment function as in e.g., (Heim and Kratzer, 1998). It bans intensionally “mixed” chains.<sup>16</sup>

(50) *Intensional Chain Uniformity (ICU)*<sup>17</sup> (formal version)

Every link in an antecedent-gap chain must be intensionally referentially equivalent, where intensional referential equivalence is defined as,

a. *Intensional Referential Equivalence*

For any antecedent  $\alpha$  and gap  $\beta$  where  $\beta$  is of the form  $[[G_1 \text{ pro}_2] w_3]$ ,  $\alpha$  and  $\beta$  are referentially

<sup>15</sup> Note that the operator in the left periphery is now a vacuous binder. I will assume that this is acceptable in this situation. We could of course build a more complex LF in which there was no vacuous binding here.

<sup>16</sup> The reader should be aware, I hope, that the rather stipulatory looking nature of the constraint in (47) is due to the assumptions concerning intensional semantics I have made. The constraint of course can be modeled under any theory of intensions and de re semantics.

<sup>17</sup> Intensional Chain Uniformity borrows heavily from Anand's (2006) notion of Referential Equivalence.

equivalent relative to an assignment function  $g$  iff, for all  $\langle x', w' \rangle$  in an attitude holder's doxastic alternatives accessible from the actual world via an intensional predicate,  $[[\alpha]]^g = [[\beta]]^{g[1 \rightarrow G, 2 \rightarrow [[\alpha]]^g, 3 \rightarrow w']}$

ICU is a constraint on a syntactic object, that is, a syntactic entity that may consist of several links in a chain. To see its effect, consider the LF of an example which does not produce an intervention effect, (51b).

(51) a. Mary was important to talk to  $e$ .

b.  $[ \text{Op}_1 \text{ Mary } \lambda 2 \text{ is } [ x_1 \text{ important } [ \lambda 3 \lambda 4 \text{ to talk to } G_3(\text{pro}_2)(w_4) ] ] ]$

c.  $[[ (48b) ] ]^{c.g.w} = 1$  iff Mary has the property such that there's an acquaintance-based concept

generator  $G$  for the speaker in  $w$  such that  $\forall \langle x', w' \rangle \in \text{IMP}_{\text{spkr}, w}, x' \text{ talks to } G(\text{Mary})(w') = 1$

The truth conditions of (51b) ask us to consider the syntactic object consisting of actual-world Mary and belief-world Mary. (51b) maps to true just in the case that actual-world Mary has the property such that for the speaker to talk to his individual-concept of Mary is important to the speaker. In this case, the syntactic object formed out of the links  $[[\text{Mary}]]$  and  $[[G(\text{Mary})(w')]]$  are intensionally referentially equivalent. This is because the alternative worlds where we're considering candidates for Mary are the speaker's (de se) worlds. More explicitly, suppose Bill says (48a), and Bill is acquainted with Mary as "the woman I hear singing next door." In all of Bill's doxastic alternatives, the concept returned for  $G(\text{Mary})(w')$  will be "the woman I hear singing next door." This is the only way that Bill knows Mary, and this syntactic object simply refers to this description of Mary.

(52) In (48b), for some  $G$  for the speaker in  $w$  and  $\forall \langle x', w' \rangle \in \text{Imp}_{\text{spkr}, w}, [[\text{Mary}]] = [[G(\text{Mary})(w')(x')]]$

But now consider what happens when there's an explicit attitude holder than intervenes.



(53) a. \* Mary was important to John to talk to *e*.

b. [ Op<sub>1</sub> Mary λ<sub>2</sub> is [ to John important [ λ<sub>3</sub> λ<sub>4</sub> to talk to G<sub>3</sub>(pro<sub>2</sub>)(w<sub>4</sub>) ] ] ]

c. [[(48b)]]<sup>c.g,w</sup> = 1 iff Mary has the property such that there's an acquaintance-based concept generator G for John in w such that  $\forall \langle x', w' \rangle \in \text{IMP}_{\text{John}, w}, x'$  talks to G(Mary)(w') = 1

In this case, the syntactic object we are considering consists of two individual(-concepts). On the one hand, there's actual-world Mary, who, in Bill's case, is "the woman I hear singing next door." But then there's the Mary that John knows. Suppose that John is confused about who Mary is, and mistakenly thinks that "the girl who's wearing a purple dress" is Mary, even though we actually know this person to be Susan. In this scenario, the syntactic object created is not intensionally uniform; it consists of actual-world Mary and actual-world Susan.

(54) In (50b), for some G for John in w and  $\forall \langle x', w' \rangle \in \text{Imp}_{\text{John}, w}, [[\text{Mary}]] \neq [[G(\text{Mary})(w')]]$

Actual-world Mary and John's Mary are extensionally different individuals. As this violates ICU, the sentence is ungrammatical.

However, isn't it possible that Mary in the actual world—call this the "speaker's version of Mary"—is the same as John's version of Mary? Actually, no---at least not entirely. Suppose that Bill and John live on either side of Mary. Both of them hear her singing and have a desire to speaker to her. When Bill utters (51), in *all* of his doxastic alternatives G(Mary)(w') is Mary. He wouldn't have been able to say "Mary" otherwise. But if Bill utters (53), it's compatible with John having beliefs in which "the woman singing next door" isn't Mary. That is, there is at least one world among John's belief worlds in which "the woman singing next door" isn't Mary. This is sufficient to constitute a violation of ICU.

In fact, the idea that a member of the actual world could be included in someone else's belief worlds has been independently argued against. Percus (2013) proposes the following principle.

(55) *Doxastic Privacy*

(Percus, 2013, p. 12)

When we describe a person's candidates for the actual world, we avoid explicitly situating individuals from other worlds among those candidates. (Or explicitly excluding them.)

What doxastic privacy says, is, when considering the set of candidates that John has for Mary in his belief worlds, we resist making reference to individuals we know to inhabit other worlds.<sup>18</sup> His reasoning is that on the Quinean view of attitude ascription, intensional predicates like *think* require us to find relations between an attitude holder and a (or any) res element. Percus observes that there doesn't appear to be a predicate (in any language) which lacks this relational property linking attitude holders to elements in the clause which is quantified over. In effect, if doxastic privacy is correct, then it bars us from *not* having a concept generator around the pronoun, as this entails that actual-world Mary is member of John's belief worlds. It also bars us from selecting a concept generator for John such that the individual-concepts of Mary that this returns all map to Mary in the actual world.

There are a number of empirical consequences of ICU. The first result is that chains which cross non-attitude holders, like the middle subject in the TTC, or experiencer arguments of *tough*-predicates, are predicted to be fine. ICU has nothing to say about such chains (which may be subject to other constraints on chain-formation).

The second result is more complex, and it will be discussed in-depth in section 6. Basically, an ICU violation is only possible when the intervening attitude holder is distinct from the matrix "attitude holder," which in the basic case is simply the speaker. That is, we only observe ICU in the *tough*-construction when there's an attitude "shift." This predicts that it should be possible to find examples where ICU is obeyed even when crossing an attitude holder—provided that the intervener is coreferent with the matrix attitude holder. Indeed, this is the case when the judge is implicit, as in (48). I will explore this prediction in the section 6, and show that it is indeed borne out in certain cases. I also explore an apparently bad prediction

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<sup>18</sup> As I understand it, Doxastic Privacy is one way of replicating the effects of Lewis' *ban on trans-world individuals*. The formalization of Concept Generators assumes that there is no such ban. We could of course change the definition for Concept Generators---and subsequently ICU---to conform to a trans-world individual ban by invoking a *counterpart* relation. Under this revision, an antecedent-gap chain obeys ICU iff all the links in the chain stand in a counterpart relation to each other *relative to a single attitude holder*. The chain in (48) meets this definition because actual-world Mary and the version of Mary in *w'* are counterparts relative to the speaker in all the speaker's alternatives. The chain in (50) is not referentially equivalent because actual-world Mary isn't necessarily a counterpart for John's Mary relative to John in all of John's belief worlds (or the speaker's).

concerning embedding, and show that this isn't actually a problem for the account. First, however, I'll try to answer why I think the *tough*-construction and the other cases illustrated above are "special." That is, why do we detect ICU in precisely these contexts?

#### 6.4 ICU everywhere?

I claim that attitude holders are interveners. But this isn't universally true. There are numerous, well known cases of syntactic chains that cross an attitudinal element, e.g., (56). *John* in (56a) is an attitude holder situated between the *wh*-element and its trace. And *Mary* is an attitude holder in (56b) situated between the raised subject and its trace.

- (56) a. Which animal is John looking for  $t_{wh}$ ?  
b. John seem to Mary  $t$  to be sleepy.

But notice that such chains do (trivially) respect ICU. Consider (56a) in a context where John has been woken up in the middle of the night by an animal outside. He thinks it's a raccoon, but we know that it's a cat. In this scenario, we can respond de re with "A cat," or we can respond de dicto with "A raccoon," but there is no way to respond where *animal* is evaluated both in the actual world and John's belief worlds. That is, there is no response in this context that can describe the animal in the actual world and in John's belief worlds.<sup>19</sup>

An analogous context for (56b) is one in which Mary sees John on a train, but has never met him and doesn't know his name. She notices that he's nodding his head and his eyes are drooping, i.e., he's sleepy. Here (56b) can be read de re, in which case we paraphrase it as, "John is such that it appears to Mary like he's sleepy." Or it can be read de dicto, in which we can paraphrase the meaning as "It appears to Mary like the man she sees on the train is sleepy." But the "mixed" reading is not present. It would have

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<sup>19</sup> Note that I've construed the scenario so that we don't have a reading where the de dicto reading is *compatible* with a de re reading, say if John actually thought it was a cat outside. The same caveat for (69b) applies: we must be careful to avoid using a reading in which the de dicto reading happens to be compatible with a de re reading.

the paraphrase, “John appears to Mary like the man she sees on the train is sleepy.”

So in both cases we are not allowed to have intensionally mixed chains, and this is consistent with what ICU predicts. The question is, what makes the *tough*-construction different from the examples in (56)? That is, why are we forced to violate ICU in the *tough*-construction? I do not have a complete answer, but I do have a suggestion that seems at least empirically true: the *tough*-construction is an *intensional island*. I mean this in two senses: Elements inside of the infinitival clause resist being interpreted outside of it, that is, in the actual world and elements outside of the infinitival clause resist being interpreted (back) inside of it. Thus, the *tough*-construction (and similar) force each link in the chain to be interpreted in its “local” domain.

Consider the scenario in (57).

(57) *John really wants to talk to Mary after she’s finished racing Sue in the 100 yard dash. He thinks that Mary won the race, but in fact, she’s the loser. Sue won.*

- a. It’s important to John to talk to the winner of the race.
- b. # It’s important to John to talk to the loser of the race.

Inside of the infinitival clause, we can describe Mary as John believes her to be, i.e., *the winner*, but we cannot describe Mary as she is in the actual world, i.e., *the loser*. Conversely, a referential subject cannot be interpreted at the gap site. In the same context as above, consider (58). (Note that a minimal pair with (57) is not possible as it would require crossing a judge. I’ve included an intensional verb in the infinitival clause to fix this issue.)

- (58)
- a. The loser of the race is important for John to want to talk to *e*.
  - b. # The winner of the race is important for John to want to talk to *e*.

That is, with an antecedent-gap chain, the subject can be described in the actual world, but not according to John’s beliefs, i.e., reconstructed below the intensional operator associated with *want*. What these facts suggest is that the antecedent-gap formed in the *tough*-construction requires both links in the chain to be

interpreted in their respective clauses. This is what results in ICU violations; if all the links of the chain must be interpreted independently, then they must be “matched” later.

The clause boundedness observed in the *tough*-construction is famously not present in either examples in (56), where only one position in the chain needs to be evaluated. QR and reconstruction can freely apply in the examples in (56) (*modulo* any other constraint on each process).

It’s worth noting that the facts about intensional interpretation conform with what has been reported for quantificational scope (Postal, 1974; Fleisher, 2013).

- (59) a. Many students are easy to teach *e*.  
      ≠ It’s easy to teach many students.  
      b. Few books are difficult to read *e*.  
      ≠ It’s difficult to read few books

Quantifiers outside of the infinitival clause cannot be interpreted at the gap site, and quantifiers inside of the infinitival clause cannot be interpreted out of it. The same facts hold for all the constructions in the list in (3), as well as RtoO.

Why does the *tough*-construction and the other structures illustrated in this paper have this islandhood behavior? To be clear, I don’t have a good answer. But consider again the places where we detect ICU, the *tough*-construction (and similar) and Raising-to-Object. These are constructions which have traditionally been interesting to formal linguists because they involve a syntactic object that appears to be thematically associated with two predicates. Looking at the list in (3), this is almost certain true of things like *pretty to look at* and *too/enough*-clauses, and more controversially true of the *tough*-construction and Raising-to-Object. Descriptively, in these configurations, the subject is thematically an argument of the main clause, and also thematically an argument of the infinitive. Speculatively, the places where ICU appears seem to constitute a natural class of constructions which have the specific property where an antecedent-gap chain be formed between two thematic positions. The cases like (56) do not have this property. They are “well-behaved” chains in which the syntactic object is thematically associated with only one position. In the case of (56a), the syntactic object is thematically an object of the verb. In the case of

(56b), the syntactic object is thematically the subject of the infinitive.

If this description of the facts is on the right track, then it seems plausible to me that being thematically related to two different verbs requires that the argument be “interpreted” in both places. ICU will be detectable because we must evaluate each link as associated with a different predicate in a different domain. We might ultimately wish to trace this to a difference between antecedent-gap chains formed by movement, and those formed by something else, e.g., predication. As this is an extremely large and controversial topic for the *tough*-construction as well as Raising-to-Object, I will have to leave this for a separate investigation. Again, while I cannot offer a better explanation, this seems to me to be a promising avenue to pursue to explain where ICU violations are invoked.

## 6.0 Consequences

### 6.1 Psych-verbs

The proposal sheds light on a class of alternations noted by (Pesetsky, 1987). Pesetsky points out that experiencer object psych-verbs bear a striking similarity to the *tough*-construction.

- (60) a. These pictures annoy me to have to look at *e*.  
b. It annoys me to have to look at these pictures.

- (61) a. Those stories please me to listen to *e*.  
b. It pleases me to listen to these stories.

- (62) a. John’s health worries me to talk about *e*.  
b. It worries me to talk about John’s health.

- (63) a. War frightens me to think about *e*.  
b. It frightens me to think about war.

(Pesetsky, 1987, ex (7))

Again, like the TTC, these alternations bear all the hallmarks of the *tough*-construction: there's an alternation between an expletive and referential subject; the gap bears properties of A'-movement; the head of the chain is thematically associated with two predicates. And just like the TTC, the Experiencer argument is syntactically an intervener. However, these experiencer object interveners differ from over cases of “failed” interveners we saw earlier in two respects. First, experiencer objects are attitudinal. We attribute to them belief about what is amusing, annoying, frightening, etc.

- (64) a. It amuses John to ride a unicorn (but I don't believe in unicorns).  
 b. It annoys John to listen to the president (but not to Trump).

The second, crucial, difference is that the  $\phi$ -features of the Experiencer object affect the availability of the antecedent-gap chain.<sup>20</sup> In declaratives, 1st person interveners are preferred over 2nd and 3rd. In questions, only 2nd person is possible.<sup>21</sup>

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<sup>20</sup> Additionally, to my ear, only bare plural/generic subjects are grammatical.

- (i) ??War and Peace frustrates me to read *e*  
 (ii) Russian novels frustrate me to read *e*.

This is reminiscent of the constraint noted in (Fleisher, 2014), in that some *tough*-predicates (*rare*-class adjectives) impose a restriction on their subjects in that they must be kind-denoting.

<sup>21</sup> Here I depart from Pesetsky in grammaticality judgments. He gives a number of examples with 3rd person Experiencers. I and others I've polled find them less than grammatical. To the extent that they are good, I would suggest that the appearance of a perspectively dependent anaphors— present in his examples to illustrate a point about connectivity—makes the phrases better. Without the anaphors, or with less “logophoric” NPs, the sentences degrade dramatically. (Non-prime examples give his grammaticality judgments.)

- (i) Pictures of each other annoy the politicians to look at *e*. (Pesetsky, 1987, ex (13a))  
 (i') ???Pictures/\*Poll numbers annoy the politicians to look at *e*.  
 (ii) Stories about herself generally pleased Mary to hear *e*. (Pesetsky, 1987, ex (13b))  
 (ii') ???Stories/\*Songs generally pleased Mary to hear *e*.

I might also point out that Pesetsky's case for connectivity here is also less than convincing. Since *picture*-NPs are notoriously fallible with respect to connectivity, it seems suspicious that the examples rely so heavily on such NPs. Indeed, when we use different NPs, grammaticality degrades again.

- (iii) \* Games with each other amuse children to play *e*.  
 (iv) \* Trees next to himself pleased John to draw *e*.

- (65) a. War frightens me to think about *e*.  
 b. \* War frightens John to think about *e*.  
 c. \* War frightens you to think about *e*.
- (66) a. \* Does war frighten me to think about *e*.  
 b. \* Does war frighten John to think about *e*?  
 c. Does war frighten you to think about *e*?

The data would be difficult to capture under a purely syntactic version of intervention, but they follow naturally from ICU. Assume that personal pronouns are interpreted as Kaplanian indexicals, picking out the speaker and the addressee in context *c*, respectively. If this is the case, then the 1st person object of a psych-verb is simply the overt reflex of the implicit 1st person judge of a *tough*-predicate.<sup>22</sup> Similarly, when the attitude holder is 2nd person, e.g., in questions, a 2nd person intervener will be tolerated, but not anything else. If questions involve something like an interrogative flip, the matrix attitude holder and the psych-verb object are identical when their 2nd person. A (yes/no) question asks, “Do you commit to the belief *P*?” The same logic as outlined above holds: in questions, only 2nd person interveners will be tolerated as 2nd person is the matrix and embedded attitude holder. Note that 3rd person are expected to never be tolerated as interveners. And this is indeed the case.<sup>23</sup>

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The data are important with respect to the issue of whether the *tough*-construction, the TTC, and psych-verbs should involve a predication versus a movement analysis. As stated previously, the issue of movement vs. predication is orthogonal to the point being made here, although I find the case for predication to be compelling.

<sup>22</sup> I assume that syntactic reasons require that the experiencer be realized overtly with psych-verbs.

Presumably, psych-verbs must assign case to their complement, while adjectives are unable to.

<sup>23</sup> Note that the same reasoning applies when the judge has been preposed, (i) (cf, Epstein, 1989).

- (i) To John, Mary is important to talk *e*.

The idea is that if the syntactic intervener is moved out of the way, grammaticality is restored. However, from a syntactic point of view, this is a rather stranger result. Presumably the movement to pre-clausal position would *follow* linking Mary to the gap. Moreover, what about the trace/copy left by movement of *to John*? There is still an element situated between the subject and the gap, so it does not come for free that



## 6.2 “Speaker variation”

The psych-verb examples suggest that we should find similar cases with the *tough*- construction. Indeed, as noted by (Hartman, 2011, fn 4), there is a great deal of “speaker variation” with respect to the grammaticality of intervention in the *tough*- construction. Seen from the perspective of the proposal above, it’s not necessarily speaker variation, rather, there are systematic constraints on what can and cannot be an intervener, and the constraints are dependent on the  $\phi$ -features of the intervener and/or the mood of the sentence.

A search of Google and the corpora at Brigham Young University (<http://corpus.byu.edu/>) illustrate the same patterns in the *tough*-construction as we found the psych-verbs: 1st person interveners are tolerated in declaratives, 2nd person are tolerated in addressee oriented speech. Examples of 3rd person interveners were not found.

### (67) NOW/COCA Corpus

- a. *Just things that I really feel are interesting to me to do*, I’ll do that subject
- b. The obligations *which are necessary to us for each student to meet*
- c. but *goody bags are fun to me to make...*
- d. I found these maps again and *the thing that was amazing to me to find* was that there are no mountains in the areas
- e. *Would that be surprising to you to learn* that you did that?
- f. *What would be interesting to me to know* - and luckily, I won't know - is whether or not this president is doing what the situation obviously screams out for and that is having some private negotiator

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the chain linking the positions is now “fixed.” On the account proposed here, the data in (i) make sense if John now takes matrix scope and the judge argument is bound at the adjective: Mary is evaluated in both positions relative to John’s beliefs. That is, there is no shift.

talking off in the corner with some negotiator out in Iraq.

(68) Google

a. *One of the things that's important to me to share is to be a good role model to them*

[www.cbc.ca/news/canada/saskatoon/sask-rush-lacrosse-youth-aboriginal-1.3540251](http://www.cbc.ca/news/canada/saskatoon/sask-rush-lacrosse-youth-aboriginal-1.3540251)

b. *Another thing that's important to me to find out from the witness, the nature of that particular neighborhood.*

<https://books.google.com/books?id=spvEkQBPPd4C>

c. *I know but I've certainly had periods of profound sadness, depression and heartache and those are the kind of things that are interesting to me to write about.*

[www.true-enlightenment.com/depression-quotes.html](http://www.true-enlightenment.com/depression-quotes.html)

d. *What cultivars are interesting to you to breed with?*

<http://forums.gardenweb.com/discussions/1980620/what-are-you-hybridizing>

e. *Select at least 2 of these procedures that are interesting to you to observe carefully for 5 days in a row every opportunity this procedure might be used.*

<http://math.arizona.edu/~vbohme/ClassroomPracticumProject.pdf>

f. *it's about being happy to come in to work everyday, finding problems that are interesting to you to solve*

<http://www.dukechronicle.com/article/2016/08/students-share-how-they-spend-their-summer-breaks>

g. *I play with friends and family and have lots of fun making decks that may not be viable in competitive but are fun to me to play.*

[https://www.reddit.com/r/magicTCG/.../is\\_it\\_worth\\_getting\\_into\\_mtg\\_at\\_this\\_point/](https://www.reddit.com/r/magicTCG/.../is_it_worth_getting_into_mtg_at_this_point/)

h. *Jerseys like that are fun to me to own.*

<http://forums.realgm.com/boards/viewtopic.php?t=1272370>

i. *the check boxes are a pain to me to fiddle with.*

<https://discussions.apple.com/thread/1111045?start=0&tstart=0>

This is precisely the state of affairs that is predicted by ICU. Intervention effects are expected to be dependent not just on the presence/absence of an intervener. Rather, intervention effects are contingent on whether or not there is an attitudinal “shift” between the subject and the gap.

To be clear, there are undoubtedly other factors that matter. For instance, we need a theory for how the examples in (X) differ.

- (69) a. It is important to talk to Mary.  
b. It is important to me to talk to Mary.

Presumably (following Pearson, 2013) an explicit judge is possible only when it bears focus. But this is probably only one of the factors that matter; discourse undoubtedly plays a large role in the corpus examples above.

### 6.3 Embedding

Finally, ICU states that as long as the matrix attitude holder and Judge are identical, *tough*-movement is fine. This allowed us to account for the alternations observed in psych-verbs and “speaker variation.” So we might predict embedding *tough*- movement inside an attitude environment would repair the intervention effects. But in general, this does not conform with our judgments. The (b) examples below are just as bad as the (a) examples.<sup>24</sup>

- (70) a. \* This book is important to John to read *e*.  
b. \* John<sub>i</sub> thinks that this book is important to him<sub>i</sub> to read *e*.

- (71) a. \* This book is fun to John to read *e*.  
b. \* John<sub>i</sub> believes that this book is fun to him<sub>i</sub> to read *e*

- (72) a. \* The play was amusing to John to watch *e*.

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<sup>24</sup> (63b) is acceptable if John is an experiencer argument, i.e., not an attitude holder.

b. \* John<sub>i</sub> believes that the play was amusing to him<sub>i</sub> to watch.

The problem here, however, is independent of *tough*-movement. In fact, even without a gap, embedding a judge under an attitude verb with the same attitude holder is generally bad, (73). This applies to all judges of subjective elements, (74a).

(73) a. \* John<sub>i</sub> believes that it's inappropriate to him<sub>i</sub> to read this book.

b. \* John<sub>i</sub> thinks it is important to him<sub>i</sub> to read this book.

(74) a. \* John<sub>i</sub> believes Mary is pretty to him<sub>i</sub>

b. \* John<sub>i</sub> believes this cake is tasty to him<sub>i</sub>

There seems to be a general constraint on embedding an attitude center under the same attitude center, i.e., recursive attitude holders.<sup>25</sup> As support for this general principle, consider the strangeness of (75) (with *he* read de se—an issue I return to in a minute).<sup>26</sup>

(75) a. ?? John<sub>i</sub> believes that he<sub>j</sub> thinks that Mary is smart.

b. ?? John<sub>i</sub> thinks that he<sub>j</sub> believes that Mary is smart.

Turning back to embedded Judges of subjective predicates, since the Judge is an attitude holder, then it

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<sup>25</sup> This is similar to, but slightly distinct from Charnavel and Mateu's (2015) constraint on antilogophoricity. The difference is that C&M are concerned with embedding different kinds of perspectival centers, while I am concerned with embedding identical attitude holders.

<sup>26</sup> Dominique Sportiche (p.c.) points out that (i) is fine. I add my own, (ii).

(i) John believes he knows that Mary is smart.

(ii) John thinks he knows how to speak French.

My intuitions are that know doesn't actually involve beliefs (at least in these cases). I'll leave this aside for now.

cannot be in the attitudinal domain of a co-referential attitude holder. Note that when *him* has reference other than John in (73a), the sentence is fine. Moreover, if *him* is read non-de se, it's also fine. This is precisely as we expect. But in no case will (70b) be salvageable. If *him* is read de se, then the ban on recursive attitude holders will apply. And if *him* is read non-de se, then ICU will rule out the sentence, since John will be considering the alternatives of someone other than himself.

## 7.0 Conclusion and prospects

I have offered here an alternative explanation for facts that have been traditionally viewed through a formal syntactic lens. The goal here was to give purchase to a more thorough explanation for cases of intervention. I argued that when considering an expanded data set including the *tough*-construction, a syntactic solution becomes unappealing. But I want to stress that I do not claim to be able to explain all intervention effects by such means. As a start, we might simply note that the above discussion has been an argument against the formalism of defective intervention (Chomsky, 2000)—indeed, I've only been concerned with a rather small subset of the cases where defective intervention has been invoked. It remains to be seen whether the explanation I have given for the *tough*-construction can (or should) be extended to other places.

With this caveat in place, the analysis provided above ties together two somewhat divergent areas of research, namely, syntax and intensionality. As such, it adds to a relatively nascent but growing field including (Anand, 2006), (Keshet, 2010), as well as (Kuno, 1987; Sells, 1987; Charnavel, 2015) on the interaction between syntax and perspectival elements. As far as Intensional Chain Uniformity is concerned, I suspect that, at least in its informal version, it is a good candidate for a cross-linguistic universal. Space has limited my discussion to English, but further exploration of the cross-linguistic facts should be revealing.

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