# The natural class of *tough*-predicates, and non-finite clauses

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#### 1 Introduction

- Decades of work have revealed a great deal about the alternation in (1), the *tough*-construction (Rosenbaum, 1967; Lasnik and Fiengo, 1974; Chomsky, 1977; Browning, 1987; Brody, 1993) a.m.o.
- (1) a. It is difficult for John to read this book.
  - b. This book is difficult for John to read *e*.
- Still, very little work has addressed *why* some predicates participate in the alternation above (*difficult*, *easy*) but other things don't (*long*, *quick*)
- Today I address this issue by exploring what defines the natural class of *tough*-predicates (ToughPreds), and what that tells us about the types of embedded clauses that appear in the *tough*-construction.
  - 1. **Expand the empirical landscape** → Lots of things (As, Ns, VPs) participate in the *tough*-alternation
  - 2. **Define the natural class of ToughPreds** → Events and Subjectivity
  - 3. **Connect** *for*-**CPs with** *tough*-**predicates** *→ For*-CPs are properties of *contentful events* (Hacquard, 2006), (Kratzer, 2006)/(Moulton, 2009), (Grano, 2015)

• The result is a uniform and consistent meaning for all ToughPreds (no ambiguities), a uniform and consistent meaning for *for*-CPs, as well as an explanation for why ToughPreds and *for*-CPs are inherently linked.

• I will not address the derivational relationship between (1). See Gluckman (in prep) for a full compositional analysis.<sup>1</sup>

#### Roadmap:

§2: Defining ToughPreds

§3: Two properties: events and subjectivity

§4: Relation to *for*-CPs (events and modality)

§5: Conclusion: cross-linguistic speculations

§6: Appendices

## 2 What makes a ToughPred

We are interested in the class of predicates that have the following two properties:

**Property I.** An expletive/pleonastic subject alternates with a non-expletive subject that is co-indexed with a non-subject gap in an embedded clause.

- (2) a. It is easy/difficult/important/tough/hard to cut this tree down.
  - b. This tree is easy/difficult/important/tough/hard to cut *e* down.

**Property II.** The non-expletive subject is a *syntactic* argument of the main clause, but a *thematic* argument of the embedded clause.

- (3) a. This tree is easy/difficult/annoying/boring to cut e down.
  - b.  $\Rightarrow$  ?? This tree is easy/difficult/annoying/boring.
- To the extent that (3b) are grammatical, it can only be with reference to some implied (or elided) event.
- In addition to *tough-adjectives*, the following classes of ToughPreds are found.

 $<sup>^1</sup>$ Many thanks to Dominique Sportiche, Yael Sharvit, Tim Stowell, Jesse Harris, Roumi Pancheva, and UCLA's SynSem. All errors my own.

2. **Tough-nouns**: a pain (in the ass/neck), a joy, a pleasure, a bitch, the pitts, a waste (of time/money), a cinch, . . . (Lasnik and Fiengo, 1974)

- (4) a. It was a pain/a pleasure/a bitch (for Tom) to paint the fence
  - b. The fence was a pain/a pleasure/a bitch (for Tom) to paint e
  - c.  $\neq$  ?? The fence was a pain/a pleasure/a bitch.
- 3. **Psych-verbs**: frighten, amuse, depress, stress out, surprise, startle, excite, ... (Pesetsky, 1987)
  - (5) a. It frightens/amuses/depresses me (for my kids) to talk about war.
    - b. War frightens/amuses/depresses me (for my kids) to talk about *e*.
    - c. *⇒* War frightens/amuses/depresses me.

Note that while (5c) has a sensible meaning, it does not mean that same thing as when there is a *for*-CP.<sup>2</sup>

- 4. *worth it/worthwhile*<sup>3</sup>: (Bayer, 1990; Jacobson, 1992; Levine and Hukari, 2006)
  - (6) a. It's worth it/worthwhile to invest in cryptocurrencies.
    - b. Cryptocurrencies are worth it/worthwhile to invest in e.
    - c. *⇒* ?? Cryptocurrencies are worth it/worthwhile.

<sup>&</sup>lt;sup>2</sup>All psych-verbs can appear in the adjectival *-ing* form as well, in which I assume that they fall into the class of *tough-*adjectives.

<sup>&</sup>lt;sup>3</sup> Bayer and Jacobson also includes dialectal worth Ving:

<sup>(</sup>i) %It's worth cleaning that sweater

<sup>(</sup>ii) %That sweater is worth cleaning *e*.

See also dialectal *needs Ving*. I put these aside here, but nothing below is contradicted by these data.

- 5.  $make sense^4$ :
  - (7) a. It makes sense (for John) to mow the lawn first.
    - b. The lawn makes sense (for John) to mow *e* first.
    - c.  $\Rightarrow$  ?? The lawn makes sense.
- 6. **Take-TIME Construction**: (Dalrymple and King, 2000; Gluckman, 2016; Klingvall, 2018) also (Chomsky, 1981, 319, fn)
  - (8) a. It took a week to paint the fence.
    - b. The fence took a week to paint *e*.
    - c.  $\Rightarrow$  ?? The fence took a week.
  - (9) a. It takes three steps to reach the door.
    - b. The door takes three steps to reach e.
    - c.  $\Rightarrow$  ?? The door takes three steps.

Note that despite its name, the TTC need not include an actual "time," merely a measure phrase that bounds the event of the infinitive.

7. *cost*: (Kawai, 2002)

- (10) a. It costs \$10 to ride the rollercoaster
  - b. The rollercoaster costs \$10 to ride e.
  - c.  $\Rightarrow$  The rollercoaster costs \$10.
- (11) a. It cost us a lot of time to visit Macchu Picchu.
  - b. Macchu Picchu cost us a lot of time to visit *e*
  - c.  $\Rightarrow$  ?? Macchu Picchu cost us a lot of time.

Like the TTC, *cost* need not involve an monetary value, just some unit of "worth."

• This is a heterogenous group of things: there are adjectives (*tough*-As), nouns (*tough*-Ns), verb phrases (TTC, psych-verbs, *cost*, *make sense*, *worth it*).<sup>5</sup>

<sup>&</sup>lt;sup>4</sup>*Make sense* is discussed in (Kiparsky and Kiparsky, 1971) in its function as a factive predicate. Otherwise, I don't believe it has been discussed in connection to the *tough*-alternation.

<sup>&</sup>lt;sup>5</sup>Note that the antecedent-gap chain is identical in all cases: both involve an  $\overline{A}$ -dependency in the lower clause headed by something in an A-position.

#### What unifies this group of elements?

1. They are all properties of events (Pesetsky, 1987; Jones, 1991; Hartman, 2012; Pearson, 2013; Collins, 2013; Longenbaugh, 2015).

2. They are all subjective.

## 2.1 ToughPreds and events

• ToughPreds are predicates of events:

		is eas	sy/difficult/important.	tough-As tough-Ns psych-Vs TTC cost make sense worth it	
		is a	a pain/a joy/a bitch.		
		frighten	s/amuses/depresses me.		
(12)	Biking to school {	takes	a while/a lot of energy.		
	_	(	costs a lot/\$1000.		
			makes sense.		
		is v	vorth it/worthwhile.		
			was easy/difficult/imp	portant. ) tough-As	
	The destruction of the city {		was a pain/a joy/a bitch.		tough-Ns
			frightened/amused/depressed me.		psych-Vs
(13)			took a while/a lot of energy.		TTC
			cost a lot.		cost
			made sense.		make sense
			was worth it/worth	while.	worth it

• This contrasts with individual-denoting subjects, which for the majority of predicates, are not licensed (as we've already seen).

tough-As	*was easy/difficult/important.		
tough-Ns	*was a pain/a joy/a bitch.		
psych-Vs	√frightened/amused/depressed me.		
TTC	*took a while/a lot of energy.	The tree/the car/the lake {	(14)
cost	√ cost a lot.		
make sense	*made sense.		
) worth it	*was worth it/worthwhile.		

• Many classes have some ambiguous members. There are predicates that describe properties of individuals in addition to describing events:<sup>6</sup>

- Since this is not a systematic commonality across ToughPreds, I put these uses aside for the rest of the talk.
  - I assume that some ToughPreds also have functions as pretty-class predicates, i.e., Mary is pretty to look at e, which don't have an expletive version.
- → To be a ToughPred, the predicate must describe a property of an event.

#### 2.2 ToughPreds and subjectivity

- In general, ToughPreds describe *subjective* events. The truth of the assertion involving a ToughPred is evaluated relative to someone's (the *judge*'s) epistemic/doxastic state.<sup>7</sup>
  - What I think is difficult/easy/important is not necessarily what you think is difficult/easy/important.

**Faultless disagreement**: With a subjective predicate, we can disagree on the truth, without either of us being judged to be speaking falsely (Kölbel, 2004).

(16) a. "This cake is vegan." (17) a. "This cake is tasty."

b. "No it's not." b. "No it's not."

<sup>&</sup>lt;sup>6</sup>It's worth noting that the TTC and *worth it/worthwhile* can never be ambiguous in this way. Conversely, psych-verbs can always be ambiguous in this way.

<sup>&</sup>lt;sup>7</sup>See (Keine and Poole, 2017) for discussion and (Fleisher, 2008) for a similar claim.

- b. "No, it isn't/doesn't."
- Note that when the judge is explicitly 1st person, then denying the truth of an assertion involving a subjective predicate becomes infelicitous.<sup>8</sup> This is the pattern seen with psych-verbs, which obligatorily subcategorize for an object.
- (19) a. "This cake is tasty to me."
  - b. # "No it isn't."
- (20) a. "It frightened/amused/depressed me to watch this movie."
  - b. # "No, it didn't."
  - The TTC and *cost* pattern a little differently. The problem with them is that they can be given non-subjective "measurements," but they still pattern as ToughPreds.<sup>9</sup>
- (21) a. It takes an hour for John to read this book.
  - b. This book takes an hour for John to read *e*.
- (22) a. It costs \$100 for us to ship this book.
  - b. This book costs \$100 for us to ship e.
  - Still, the TTC and *cost* are *modal* elements: they describe preconditions (the passing of an hour, the payment of \$100) for the proposition denoted by the *for*-CP.
  - Assuming that subjectivity and modality are two sides of the same coin (Stephenson, 2007), we can state concisely the natural class of ToughPreds:

## $\leadsto$ To be a ToughPred, the predicate must describe a <u>subjective event</u>.

- We define the general schema for all ToughPreds in the following way. (I assume a judge parameter represented as *j* (Lasersohn, 2005), though nothing depends on this choice.)
- (23)  $[TOUGHPRED]^j = \lambda e \lambda w$ . TOUGHPRED(e) in w relative to j.
  - Note that (23) also subsumes purely modal *tough*-predicates like, *crucial*, *illegal*, *impossible*, . . . .

<sup>&</sup>lt;sup>8</sup>This is sometimes called *faulty disagreement*, as opposed to *faultless disagreement*.

<sup>&</sup>lt;sup>9</sup>They can also be given subjective measurements, like a while or a lot of money.

## 3 ToughPreds and clause types

• In principle there could be a ToughPred that occurs with a finite clause.

- (24) a. It is schmifficult that John read this book.
  - b. \* This book is schmifficult that John read *e*.

unattested

- This kind of predicate doesn't exist (cross-linguistically, Comrie and Matthews 1990).
- In English, all ToughPreds *can* combine with *for*-CPs; and all ToughPreds *must* combine with a *for*-CP when there's an antecedent-gap. <sup>10</sup>
- Why does the *tough*-construction in general involve *for*-CPs and not other clause types (e.g., finite clauses)? Or stated differently, what is the correlation between subjective events and *for*-CPs?
- The core observation here is that *for*-CPs also describe special kinds of events: events that are associated with propositional content.
  - As such they need an event with an attitude holder and a set of beliefs.
     This is what the ToughPred provides.

#### 3.1 For-CPs, propositions, and events

- For-CPs have a dual status:
  - Semantically, *for*-CPs are typically grouped together with finite CPs in that they describe "state of affairs" (Chierchia, 1990) or (modal) propositions (Bresnan, 1971; Stowell, 1982; Bhatt, 1999; Portner, 1997)
  - However, distributionally, *for*-CPs, are often grouped together with gerunds (Rosenbaum, 1967; Duffley, 2003): they appear to denote events.
- Like gerunds, and unlike finite CPs, they can refer to iterated occurrences.
- (25) a. (For John) to skip school is a frequent occurrence.
  - b. (For the magician) to make the rabbit vanish was a one-time event.
  - c. (For the Cubs) to win was a rare occurrence.

<sup>&</sup>lt;sup>10</sup>Modulo dialectal worth Ving/needs Ving discussed in footnote 3.

- (26) a. (John's) skipping school is a frequent occurrence.
  - b. (The magician's) making the rabbit vanish was a one-time event.
  - c. (The Cub's) winning was a rare occurrence.
- (27) a. \* That John skipped school is a frequent occurrence.
  - b. \* That the magician made the rabbit vanish was a one-time event.
  - c. \* That the Cubs win is a rare occurrence.
  - Similarly, they can be anaphorically referred to using *event*.
- (28) a. (For John) to open the door would startled me. Yes, that event would startle me, too.
  - b. (For the magician) to make the rabbit vanish would amaze me. Yes, that event would amaze me, too.
  - c. (For the Cubs) to win would excite John. Yes, that event would excite John.
  - They can be used predicatively to describe an event (here as a purpose clause), but not an individual-denoting nominal (Faraci, 1974; Jones, 1991).
- (29) a. The examination was [ for the teacher to assess the kids' potential ]
  - b. \* The classroom was [ for the teacher to assess the kids' potential ]
  - c. The election was [ for the country to determine its next ruler]
  - d. \* The constitution was [ for the country to determine its next ruler ]
  - So the generalization is that *for*-CPs syntactically pattern like eventive expressions, but at the same time they express (modal) propositions.

**Proposal:** *For-*CPs describe properties of *contentful events*.

## 4 Analysis

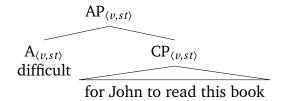
**Assumption 1:** Finite clauses headed by *that* describe *contentful individuals* whose content is the proposition denoted by *that*'s complement (Kratzer, 2006; Moulton, 2009).

- (30) a.  $[C_{that}] = \lambda P_{\langle st \rangle} \lambda x \lambda w$ . Content(x)(w) = { w' : P(w') = 1 } b.  $[that John left] = \lambda x \lambda w$ . Content(x)(w) = { w' : John left in <math>w' } c.  $[story] = \lambda x \lambda w$ . story(x)(w) d.  $NP_{\langle a,st \rangle}$ 
  - $NP_{\langle e,st \rangle}$   $N_{\langle e,st \rangle}$   $CP_{\langle e,st \rangle}$  that John left
  - e.  $[(30d)] = \lambda x \lambda w$ . story(x)(w) & CONTENT $(x)(w) = \{ w' : John left in <math>w' \}$
- **Assumption 2:** There are also *contentful events*, i.e., events which are associated with propositional content, like the event argument associated with *believe* (Hacquard, 2006; Kratzer, 2013).
  - Generalizing these two ideas, *for*-CPs are the counterpart to *that*-CPs: they are predicates of *contentful events*, equating the content of the event with the proposition denoted by the clause. (See also a similar treatment in Grano 2015.)<sup>11</sup>
  - (31) a.  $\mathbb{C}_{for}\mathbb{I} = \lambda P_{\langle v,st \rangle} \lambda e \lambda w$ . Content(e)(w) = {  $w' : \exists e'$  such that P(e')(w') = 1 } b.  $\mathbb{I}_{for} \text{ John to read this book} \mathbb{I} = \lambda e \lambda w$ . Content(e)(w) = {  $w' : \exists e'$  such that John reads-e' this book in w' }
    - (The existential quantification over events in the modal worlds is needed for reasons that are not directly relevant here.)

<sup>&</sup>lt;sup>11</sup>I'm ignoring modal bases and ordering sources, but see Grano again for related discussion. The CONTENT function employed here is consistent with FACTUALITY modal base (Kratzer, 2013). Note that this follows an established tradition of placing the modality associated with *for-CPs* on the complementizer (Pesetsky, 1992; Bhatt, 1999) (or somewhere inside of the non-finite clause Portner 1997; Wurmbrand 2014), as opposed to on the matrix predicate.

• *For*-CPs distribute like an event-denoting elements, but they can only appear in a (syntactic) context that supplies an event associated with a set of beliefs:

(32) a.



- b.  $[(32a)]^j = \lambda e \lambda w$ . difficult(e) in w relative to j & CONTENT(e)(w) = { w' :  $\exists e'$  such that John read-e' this book in w' }
- This is consistent with the noted fact that *for*-CPs are "modally restricted." They must occur in the presence of a modal operator (Faraci, 1974; Pesetsky, 1992; Portner, 1997).
- (33) a. ?? John loved for Mary visit Chicago. (ok on generic reading)b. John would love for Mary to visit Chicago.

#### **Takeaways:**

- A uniform denotation for all ToughPreds. There's no need to list two versions of all ToughPreds. They are always predicates of subjective events. Sometimes they have an event-denoting subject, sometimes they simply combine with a *for*-CP.
- An explanation for the connection between ToughPreds and *for*-CPs. ToughPreds provide precisely what *for*-CPs need, an event with a set of beliefs.
  - Conversely, *that*-CPs are expected not to appear with ToughPreds.
    - (34) \* It was difficult/easy/hard that John went to Chicago.

See appendix for more discussion.

• Captures dual status of *for*-CPs. The eventive/propositional nature of *for*-CPs follows from their meaning as a property of a contentful event.

# 5 On cross-linguistic variation

• It's notable that the same predicates tend to be ToughPreds cross-linguistically. But, there is also significant variation as well (Comrie and Matthews, 1990).

- German and Scandinavian languages seem to have "more" *tough*-constructions.
- Turkish seems to have none.
- Where would this variation stem from? Possibly:
  - Which predicates describes subjective events.
  - How subjectivity is syntactically/semantically encoded
  - Whether the language has the right kind of non-finite clause.

Thanks!

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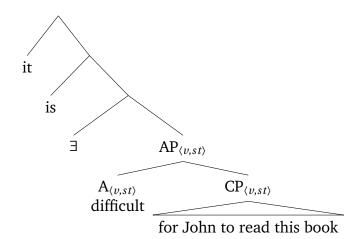
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## Appendix: Full structure

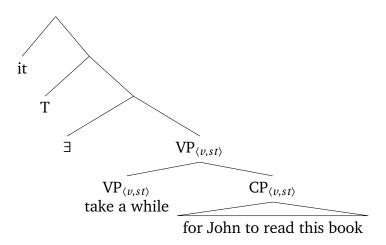
- (35) Event Closure after (Moulton, 2015, 25)  $[\![\exists ]\!] = \lambda P_{(v,st)} \lambda w$ .  $\exists e$  such that P(e)(w) = 1
- (36) It is important for John to read this book

a.



b.  $[(36a)]^j = \lambda w$ .  $\exists e$  such that e is difficult in w relative to j & CONTENT $(e)(w) = \{ w' : \exists e' \text{ in } w' \text{ such that John reads-} e' \text{ this book in } w' \}$ 

(37) a.



b.  $[(??)]^j = \lambda w$ .  $\exists e$  such that e takes a while in w relative to j & CONTENT $(e)(j)(w) = \{ w' : \exists e' \text{ in } w' \text{ such that John reads-}e' \text{ this book in } w' \}$ 

# **Appendix: Modifier status**

#### **Nominalizations**

• Nominalized ToughPreds can occur with event-nominal complements, but not *for*-CPs. (Not all ToughPreds can be nominalized.)

(38) a. The 
$$\begin{cases} \text{ difficulty amusement } \\ \text{ cost } \\ \text{ worth} \end{cases}$$
 
$$\begin{cases} \text{ of the exam } \\ \text{ of taking the exam } \\ \text{ *for the students to take the exam } \end{cases}$$
 
$$\text{b.} \quad \text{The} \begin{cases} \text{ ease } \\ \text{ pleasure } \\ \text{ cost } \\ \text{ worth} \end{cases}$$
 
$$\begin{cases} \text{ of at-home check-in } \\ \text{ of checking-in at home } \\ \text{ *for us to check-in at home } \end{cases}$$

- If the *for*-CP combined with the *tough*-predicate in the same way, i.e., by saturating the event-slot, this difference is unexplainable.
- Note that *for*-CPs can otherwise occur with nominals (Stowell, 1981; Grimshaw, 1990).

#### Clausal omission and ellipsis

- Unlike true arguments, for-CPs can be omitted if they are highly salient.
- (39) a. Did you talk to John yesterday?
  - b. No, I didn't see \*(him).
- (40) a. Did you have trouble reading those books last week?

- Similarly, *for*-CPs can be elided with ToughPreds.
- (41) a. \* That girl is quite likely to finish the exam, but her sister is almost sure.

- (42) a. \* John waited for Mary to come home, but Bill didn't wait < for Mary to come home>
  - b. \* John planned for Mary to visit Scotland, but Bill didn't plan <for Mary to visit Scotland>

## **Appendix: Ambiguous ToughPreds**

• Some ToughPreds can *only* describe contentful individuals. They don't combine with nominals expressing contentful events, nor do they express combine with *that-CPs*.

• Other ToughPreds can combine with nouns denoted contentful individuals. Precisely these predicates may also combine with *that*-CPs.

• And of course, some predicate may readily occur with contentful individuals and *that*-CPs, but not event-denoting things.

- (45) a. This fact/story/belief is obvious/evident/clear.
  - b. \* Running/the examination of the students is obvious/evident/clear.
- (46) a. It's obvious/evident/clear that John went to Sacramento.
  - b. \* It's obvious/evident/clear for John to go to Sacramento.