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.[1]

Roadmap:

§2: Defining ToughPreds                      §5: Conclusion: cross-linguistic speculations
§3: Two properties: events and subjectivity   §6: Appendices
§4: Relation to for-CPs (events and modality)

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. \( \not\Rightarrow ?? \) 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.

[1] 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
   c. ¬ ?? 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

4. **worth it/worthwhile**

   (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.

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2 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.

3 Bayer and Jacobson also includes dialectal worth Ving:

   (i) %It's worth cleaning that sweater
   (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**: 
   
   (7) a. It makes sense (for John) to mow the lawn first.
   b. The lawn makes sense (for John) to mow first.
   c. $\not\Rightarrow$ ?? 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.
   c. $\not\Rightarrow$ ?? The fence took a week.

   (9) a. It takes three steps to reach the door.
   b. The door takes three steps to reach.
   c. $\not\Rightarrow$ ?? 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.
   c. $\not\Rightarrow$ 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.
   c. $\not\Rightarrow$ ?? 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).[^5]

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[^5]: 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.

[^5]: 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?


2. They are all subjective.

2.1 ToughPreds and events

- ToughPreds are predicates of events:

\begin{align*}
(12) \text{Biking to school} & \begin{align*}
\text{is easy/difficult/important.} & \quad \text{tough-As} \\
\text{is a pain/a joy/a bitch.} & \quad \text{tough-Ns} \\
\text{frightens/amuses/depresses me.} & \quad \text{psych-Vs} \\
\text{takes a while/a lot of energy.} & \quad \text{TTC} \\
\text{costs a lot/$1000.} & \quad \text{cost} \\
\text{makes sense.} & \quad \text{make sense} \\
\text{is worth it/worthwhile.} & \quad \text{worth it}
\end{align*}
\end{align*}

(13) The destruction of the city

\begin{align*}
\text{was easy/difficult/important.} & \quad \text{tough-As} \\
\text{was a pain/a joy/a bitch.} & \quad \text{tough-Ns} \\
\text{frightened/amused/depressed me.} & \quad \text{psych-Vs} \\
\text{took a while/a lot of energy.} & \quad \text{TTC} \\
\text{cost a lot.} & \quad \text{cost} \\
\text{made sense.} & \quad \text{make sense} \\
\text{was worth it/worthwhile.} & \quad \text{worth it}
\end{align*}

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

(14) The tree/the car/the lake

\begin{align*}
\text{*was easy/difficult/important.} & \quad \text{tough-As} \\
\text{*was a pain/a joy/a bitch.} & \quad \text{tough-Ns} \\
\text{✓frightened/amused/depressed me.} & \quad \text{psych-Vs} \\
\text{*took a while/a lot of energy.} & \quad \text{TTC} \\
\text{✓cost a lot.} & \quad \text{cost} \\
\text{*made sense.} & \quad \text{make sense} \\
\text{*was worth it/worthwhile.} & \quad \text{worth it}
\end{align*}
Many classes have some ambiguous members. There are predicates that describe properties of individuals in addition to describing events:

\[
\begin{align*}
\text{is (being) difficult.} \\
\text{is (being) a pain.} \\
\text{is annoying me.} \\
\text{is making sense.} \\
\text{costs $100.}
\end{align*}
\]

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.

\[\Rightarrow \text{To be a ToughPred, the predicate must describe a property of an event.}\]

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:

– 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).

\[
\begin{align*}
\text{(16) a. } & \text{“This cake is vegan.”} & \text{(17) a. } & \text{“This cake is tasty.”} \\
\text{b. } & \text{“No it’s not.”} & \text{b. } & \text{“No it’s not.”}
\end{align*}
\]

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6 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.

7 See (Keine and Poole 2017) for discussion and (Fleisher 2008) for a similar claim.
(18)  a. “It \Big\{
        \begin{align*}
         & \text{is easy/difficult/important} \\
         & \text{is a pain/a joy/a bitch} \\
         & \text{makes sense} \\
         & \text{is worth it/worthwhile}
        \end{align*}
 \Big\} \text{ (for John) to read this book.}
 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. 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.

(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, we can state concisely the natural class of ToughPreds:

\[ \text{To be a ToughPred, the predicate must describe a subjective event.} \]

• 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) \[ \text{ToughPred}^j = \lambda e \lambda w. \text{ToughPred}(e) \text{ in } w \text{ relative to } j. \]

• Note that (23) also subsumes purely modal tough-predicates like, crucial, illegal, impossible, . . . .

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8This is sometimes called faulty disagreement, as opposed to faultless disagreement.
9They 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.  

• 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.[10]

• 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.


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(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 expres-
  sions, 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).

\[ C_{that} = AP(st)Ax\lambda w. \text{CONTENT}(x)(w) = \{ w' : P(w') = 1 \} \]

\[ [\text{that John left}] = Ax\lambda w. \text{CONTENT}(x)(w) = \{ w' : \text{John left in } w' \} \]

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.)

\[ C_{for} = AP(v,st)Ae\lambda w. \text{CONTENT}(e)(w) = \{ w' : \exists e' \text{ such that } P(e')(w') = 1 \} \]

\[ [\text{for John to read this book}] = Ae\lambda w. \text{CONTENT}(e)(w) = \{ w' : \exists e' \text{ such that John reads-e' this book in } w' \} \]

- (The existential quantification over events in the modal worlds is needed for reasons that are not directly relevant here.)

\[ \text{The CONTENT function employed here is consistent with FACTUALITY modal base (Kratzer, 2013). Note that this follows an established tradition of placing the modality associated with for-CPs on the complementizer (Pesetsky, 1992; Bhatt, 1999) (or somewhere inside of the non-finite clause Portner 1997; Wurmbrand 2014), as opposed to on the matrix predicate.} \]

\[ \text{www.jgluckman.com} \]
• 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. 

\[
\text{AP}_{(v,st)} \quad \text{A}_{(v,st)} \quad \text{CP}_{(v,st)}
\]

\text{difficult} \quad \text{for John to read this book}

b. 

\[
[\text{1.2a}] = \lambda e \lambda w. \text{difficult}(e) \text{ in } w \text{ relative to } j \text{ & } \\
\text{CONTENT}(e)(w) = \{ w' \colon \exists e' \text{ such that John read-}e' \text{ this book in } w' \}
\]

• 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. \hspace{1cm} \text{(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!
References


**Appendix: Full structure**

(35) \[ \text{Event Closure} \quad \exists f = \lambda P_{(v,st)} \lambda w. \exists e \text{ such that } P(e)(w) = 1 \]

(36) It is important for John to read this book
a. 

\[
\begin{array}{c}
\text{it} \\
\text{is} \\
\exists \quad \text{AP}_{(v,st)} \\
\quad \text{A}_{(v,st)} \quad \text{CP}_{(v,st)} \\
\quad \text{difficult} \\
\quad \text{for John to read this book}
\end{array}
\]

b. 

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

(37) a. 

\[
\begin{array}{c}
\text{it} \\
\text{T} \\
\exists \quad \text{VP}_{(v,st)} \\
\quad \text{VP}_{(v,st)} \quad \text{CP}_{(v,st)} \\
\quad \text{take a while} \\
\quad \text{for John to read this book}
\end{array}
\]

b. 

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

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 \{ difficulty
amusement
cost
worth\} \{ of the exam
of taking the exam
*for the students to take the exam\}

b. The \{ ease
pleasure
cost
worth\} \{ of at-home check-in
of checking-in at home
*for us to check-in at home\}

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?

\[
\begin{cases}
\text{was easy} \\
\text{was a cinch} \\
\text{amused me}
\end{cases}
\]

b. No, it \[
\begin{cases}
\text{took no time at all} \\
\text{cost me nothing} \\
\text{made sense} \\
\text{was totally worth it}
\end{cases}
\]

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.
b. This story is easy to translate, but the other one is difficult is a pain depresses me took a while cost a lot wasn't worth it adapted from Bayer 1990, 33

(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.

(43) a. * The story/fact/rumor \quad \begin{array}{l}
\text{was difficult/easy/tough} \\
\text{was a pain/a cinch/a bitch} \\
\text{took an hour} \\
\text{was worth it/worthwhile}
\end{array}

b. It \quad \begin{array}{l}
\text{was difficult/easy/important} \\
\text{was a pain/a cinch/a bitch} \\
\text{took an hour} \\
\text{was worth it/worthwhile}
\end{array} \quad \text{that John read this book.}

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

(44) a. The story/fact/rumor \quad \begin{array}{l}
\text{was important/embarrassing/shocking} \\
\text{made sense}
\end{array}

b. It \quad \begin{array}{l}
\text{was important/embarrassing/shocking} \\
\text{made sense}
\end{array} \quad \text{that John read this book.}

- 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.