

Implicative verbs and their presuppositions*
7th California Universities Semantics and Pragmatics Workshop
November 8, 2014

Prerna Nadathur
Department of Linguistics, Stanford University

1 Introduction

Two-way **implicative** verbs in English and Finnish entail the truth of their infinitival complements (Karttunen 1971). The polarity of the implication reverses with upstairs negation.

- (1) a. Hän **onnistu-i** kuitenkin pakenema-an.
 he-NOM succeed-PST.3sg however flee-3INF.ILL
 ‘He succeeded in fleeing’
 b. He **managed** to flee.
 c. \vdash He fled.
- (2) a. Hän e-i **onnistu-nut** kuitenkaan pakenema-an.
 he-NOM neg-3sg succeed-PP.sg however flee-3INF.ILL
 ‘He didn’t succeed in escaping’
 b. He didn’t **manage** to flee.
 c. \vdash He didn’t flee.

The problem (cf. Karttunen) is to explain what blocks the “intuitively unacceptable conclusion” that the implicative sentences are logically equivalent to the assertion of their complements.

2 The contribution of the implicative verb

2.1 Presuppositions

Given an implicative I , and a downstairs event X , the following relationships hold:

- (3) $I(X) \vdash X$
- (4) $\neg I(X) \vdash \neg X$
- (5) $X \not\vdash I(X)$

The “upwards” entailment in (5) is thought to be blocked by presuppositional content attached to I (e.g. *manage to X* presupposes trying to X or difficulty in doing X ; Karttunen 1971, Bhatt 1999). Since X need not validate the presuppositions of I , $I(X)$ does not follow from X .

*Thanks are due to Lauri Karttunen, Itamar Francez, and Stanley Peters for helpful discussion of these ideas. Additional thanks go to three anonymous non-linguist informants, and to Ida Toivonen and Karoliina Lohiniva for some last-minute assistance with glossing (and case). All errors are, as usual, mine.

English	Finnish	Examples
dare	<i>uskaltaa</i>	<i>Hän uskals-i avat-a ove-n</i> he.NOM dare-PST.3sg open-INF door-GEN/ACC He dared to open the door
bother	<i>viitsiä</i>	<i>Hän e-i viitsi-nyt vastast-a</i> he.NOM neg-3sg bother-PP.sg answer-INF He didn't bother to answer
condescend	-	He condescended to meet the petitioners
-	<i>iljetä</i>	<i>Hän e-i iljen-nyt katso-a</i> he.NOM neg-3sg bring.self*-PP.sg look-INF 'He couldn't bring himself to look'

The examples above support the presupposition argument:

- *dare (uskaltaa) to X* presupposes a need for courage in doing *X*
- *condescend to X* presupposes disdain for doing *X* (see Karttunen 2012)
- *iljetä* presupposes (the speaker's opinion) that there should be aversion towards *X*

In each case, the presupposed content of *I* bears some relationship to the accomplishment of *X*.

2.2 The ingredients of an analysis

What are the necessary components of the utterance *I(X)* (or its negation)?

- *I(X)* conditions the accomplishment of *X* (in some way) on the validity of the presupposition(s) of *I* (blocking “upwards” entailment)
- This conditioning relationship involves both necessity and sufficiency: *I (managing, bothering, daring)* is both necessary and sufficient for *X*
- An assertion of *I(X)* or its negation informs us (somehow) as to whether or not *X* occurred.

Presupposed content and asserted content will work together to give us these outcomes.

3 *Manage* and causal dependence

Departing from a view on which the assertion of *manage to X* is trivially just *X*, Baglini & Francez (2013) propose:

- (6) A statement *manage to X*:
 - a. presupposes the existence of a *causally necessary but causally insufficient* “catalyst” for the accomplishment of *X*¹
 - b. asserts that the catalyst *actually caused X* in the relevant context

¹Baglini & Francez provide arguments, cf. Coleman (1975), that the presupposition of *manage* must be less specific than either difficulty or unlikelihood, since it can be realized as either.

Causal necessity is presupposed, but sufficiency in context follows only from the assertion (which is therefore non-trivial).

3.1 Causal dependence (Schulz 2011)

Causal dependence is modeled using Schulz’s (2011) notion of **causal entailment**, which is determined on the basis of:

- a **dynamics**, a contextually-manipulated parameter which represents causal relationships between a set of relevant proposition symbols

(7) A dynamics D over a set of propositions P contains:

- a set $B \subseteq P$ of background propositions (facts that are causally independent of others in P)
- the set $I = P - B$ of “inner” propositions (facts that causally depend on one another or on B)
- a function F sending any element $p \in I$ to a tuple (Z_p, f_p) where:
 - Z_p is the set of propositions which p causally depends on
 - f_p tells us how to determine a truth value for p from the values for the propositions in Z_p

- a **situation**, an assignment of proposition symbols to values from the 3-way logic $\{u, 0, 1\}$
- an **operator** \mathcal{T}_D which calculates immediate causal effects (as per D), given a situations s . \mathcal{T}_D updates the value assigned to a proposition $p \in I$ according to its function f_p iff $s(p) = u$ and f_p is defined on the settings for the relevant symbols in s .

(8) Given a dynamics D and a situation s , $\mathcal{T}_D(s)$ is defined, for all $p \in P$, as

- If $p \in B$, then $\mathcal{T}_D(s)(p) = s(p)$
- If $p \in I$ and $Z_p = \{q_1, \dots, q_n\}$, then
 - If $s(p) = u$ and $f_p(s(q_1), \dots, s(q_n))$ is defined (is 0 or 1), then $\mathcal{T}_D(s)(p) = f_p(s(q_1), \dots, s(q_n))$
 - If $s(p) \neq u$ or $f_p(s(q_1), \dots, s(q_n))$ is undefined, then $\mathcal{T}_D(s)(p) = s(p)$

A set Σ of literals then *causally entails* a proposition ϕ in a dynamics D ($\Sigma \models_D \phi$) if some number of iterations of applying \mathcal{T}_D to the situation s_Σ (which validates the propositions in Σ and leaves all others undetermined) results in the assignment of ϕ to 1.²

Given D and an initial setting s we have the following:

- C is **causally necessary** for X iff $\neg C \models_D \neg X$
- C is **causally sufficient** for X iff $C \models_D X$

²This iterative process always has a fixed point, so causal entailment is well-defined.

3.2 How the account works

Baglini & Francez additionally define:

- A proposition C **actually causes** X in a world w (a situation where all variables are assigned to either 0 or 1) iff $C \in Z_X$ and $C, X = 1$ in w

Consequently:

- Since *manage to X* asserts that the catalyst C *actually caused* X , we have $C, X = 1$. This gets us the positive entailment.
- On the other hand, $\neg(\textit{manage to } X)$ asserts that C did not *actually cause* X . Since $C \in Z_X$ is presupposed to be 1,³ X must be 0. This gets us the negative entailment.
- The bleached nature of the presupposition allows context to supply the inferences to trying, difficulty, and unlikelihood that have all been argued to come along with *manage* (e.g. Coleman 1975)
- The content of the assertion provides an explanation for the interaction of *manage*-sentences with *because*-clauses (and certain other modifiers):

- (9) a. John **managed** to buy the ring because it was cheap.
b. John bought the ring because it was cheap.

In each case, the *because*-clause modifies the assertion: in the first case, *because* explains how the catalyst caused X , and in the second why John bought the ring.

4 Some complications

4.1 The existence of one-way implicatives

It is not clear whether this account extends to implicative verbs as a class, and in particular if it can capture one-way implicatives:

- (10) a. John **was able** to solve the problem.
b. \nVdash John solved the problem.
- (11) a. John **was not able** to solve the problem.
b. \vdash John did not solve the problem.
- (12) a. Hãn **jakso-i** noust-a
he.NOM have.strength-PST.3sg rise-INF
‘He had sufficient strength to rise’
b. \nVdash He rose.

³For Baglini & Francez, the presupposition of the *existence of a catalyst* C apparently also means that the value of C in the current situation is set to 1.

- (13) a. Hän e-i **jaksa-nut** noust-a
 he.NOM neg-3sg have.strength-PP.sg rise-INF
 ‘He did not have the strength to rise’
 b. \vdash He did not rise.

We get the negative entailment as before, but it seems like we can’t avoid the positive one:

- We can’t decrease the presupposed content substantively without losing the negative entailment (and validating the incorrect “upwards” entailment)
- Reducing the assertion to the trivial case (X) doesn’t help

4.2 Catalysts and actual causes

Several things follow from the interaction of the causal presuppositions and the *actually caused* relation:

- The presupposition holds that $\neg C \models_D \neg X$ and $\neg(C \models_D X)$
- Causal insufficiency, on this framework, requires that Z_X contains at least one variable that is neither C nor causally dependent on C .
- In particular, there must be at least one proposition Y s.t. $C \neq Y$ and $\neg Y \models_D \neg X$
- *Actually causes* means that C is contextually sufficient to ensure X ; thus any other causally necessary conditions for X must be assumed to be met.
- For the negative assertion, Baglini & Francez use the presupposition that C holds to conclude that X does not; this requires that some Y does not hold

The last point doesn’t seem right for arbitrary implicatives:

- (14) a. Hän **henno-i** tappa-a kissa-n
 he.NOM have.the.heart-PST.3sg kill-INF cat-GEN/ACC
 ‘He had the heart to kill the cat’
 b. \vdash He killed the cat.
- (15) a. Hä e-i **henno-nut** tappa-a kissa-a
 he.NOM neg-3sg have.the.heart-PP.sg kill-INF cat-PART
 ‘He did not have the heart to kill the cat’
 b. \vdash He did not kill the cat

In (14) it seems correct that the specified catalyst (“heart” or resolve) was present, but in (15) the assertion seems to say precisely the opposite: that the catalyst was not present.

5 A revised proposal

5.1 The changes

Manage is a special case, and this makes the notion of a catalyst (or causal condition) hard to grasp. More prototypical/less bleached examples like (14)-(15) provide a better view of the big picture.

(16) **Claim 1:**

Implicative verbs (both one-way and two-way) presuppose⁴ the existence of a causally necessary condition C for X .

(17) **Claim 2:**

$I(X)$ asserts that C was met in the situation at hand; $\neg I(X)$ asserts that it was not.

(18) **Claim 3:**

Two-way implicatives have a second, *circumscriptive*, presupposition: the invoked condition C is the only thing in question for the accomplishment of X in the situation at hand.

Crucially:

- The presupposition that C exists does not presuppose that it holds; rather it serves the purpose of highlighting that a causally necessary condition is in question
- Whether or not C holds is established by the assertion, as (14)-(15) suggest
- X is a logical consequence of presuppositions plus assertion; it is not asserted directly
- Sufficiency, when it holds, is *not at issue*

Slightly more formally, the presupposition here informs us about the structure of the relevant dynamics, and the assertion sets certain proposition values in it:

- The presupposition tells us that Z_X contains at least one variable which is either C or causally dependent on it, such that $\neg C \models_D \neg X$.
- It does not tell us what else X may (or may not) depend on (D is underdetermined)
- The assertion either sets $C = 1$ or $C = 0$
- If $C = 0$, we can conclude that $\neg X$. This gets us the negative entailment for both one-way and two-way implicatives.
- For one-way implicatives, this is all we have: since we only know that C is necessary for X but don't know what else may or may not be, we can't conclude anything from C
- Two-way implicatives also presuppose that only C is in question; all other causally necessary conditions have been met; C therefore licenses the conclusion X .

⁴I use “presuppose” here loosely, as do Baglini & Francez; the content described as presuppositional is projective and not-at-issue, but I do not intend to exclude other possible classifications of such content (cf. Tonhauser et al 2013).

On this view, the notion of a catalyst is set aside for a more general notion of a highlighted causal condition. Implicative verbs vary (and may be expected to vary) as to the nature of *C*, and its degree of specificity:

- *dare*, *bother*, *be able* and the Finnish *iljetä*(=bring.self*), *hennoa*(=have the heart), *jaksaa*(=have sufficient strength) are quite specific, whereas *manage* and *onnistua*(=succeed) are vague
- the vagueness of *manage* makes it a two-way implicature almost by default:
 - *manage* “bundles” conditions; it simply presupposes that *X* is not causally independent in *D*
 - the positive assertion sets any causally necessary condition in *D* to 1, licensing the conclusion that *X* (circumscription does not apply here)

We preserve the benefits (modifiers, contextually varying realizations of the condition) of Baglini & Francez’s analysis, but now as a special case in a more general theory of implicatives

5.2 Supporting evidence and implicatures

The following contextualized examples support treating sufficiency/circumscription as presuppositional on two-way implicatives:

- (19) A hunter in the forest lost count of the number of times he had fired his gun and was not sure if he had used all of the bullets or not. He decided to check the gun after eating something, and put it down to get some food from his pack. While he had both hands in the bag, he caught sight of a bear coming towards him. We are wondering if he shot it.

Hän **eht-i** ampu-a karhu-n
 he.NOM have.time-PST.3sg shoot-INF bear-GEN/ACC

‘He had enough time to shoot the bear’

The example is infelicitous⁵ because *D* contains a second contextually-specified necessary but undetermined condition for *X*. Similarly:

- (20) Two versions of a survey were prepared for a policy consultant to take door to door. One version had an unusually detailed question about sexual preferences which was not on the other. The policy consultant was only given one version, but we don’t know which. We are wondering whether he asked the personal question.

Hän **kehtas-i** kysy-ä niin henkilökohtais-i-a asio-i-ta
 he.NOM unashamed-PST.3sg ask-INF such personal-PL-PART thing-PL-PART

‘He was unashamed to ask something so personal’

Question: Are the negative cases also infelicitous?

⁵One informant said “I would not use *ehä* here because, if he didn’t have bullets, he could not have shot the bear.”

One-way implicatives often conversationally implicate the non-entailed direction (Karttunen 2012):

- (21) a. John **was able** to solve the problem.
b. \leadsto John solved the problem.
- (22) a. Hän **mahtu-i** kulke-ma-an ove-sta
he.NOM fit-PST.3sg go-INF-ILL door-ELA
'He was small enough to go through the door.'
b. \leadsto He went through the door.

On the proposal outlined here, this is predictable behavior. Circumscription, or the inference that only the invoked (mentioned, highlighted) condition is in question, can easily be licensed contextually. The implicature is blocked when the context supplies other possible obstacles (e.g. fear of going through the door, John's lack of interest in the problem).

6 Polarity-reversing implicatives and other questions

There are also two- and one-way polarity-reversing implicatives :

- (23) a. Hän **laiminlö-i** korjat-a virhee-n
he.NOM neglect-PST.3sg repair-INF error-GEN/ACC
He **neglected** to correct the error
b. \vdash He did not correct the error
- (24) a. Hän e-i **laiminlyö-nyt** korjat-a virhe-ttä
he.NOM neg-3sg neglect-PP.sg repair-INF error-PART
He did not **neglect** to correct the error
b. \vdash He corrected the error
- (25) a. Hän **epärö-i** otta-a osa-a kilpailu-n
he.NOM hesitate-PST.3sg take-INF part-PART race-ILL
He **hesitated** to take part in the race
b. \nvdash He didn't take part in the race
- (26) a. Hän e-i **epäröi-nyt** otta-a osa-a kilpailu-n
he.NOM neg-3sg hesitate-PP.sg take-INF part-PART race-ILL
He did not **hesitate** to take part in the race
b. \vdash He took part in the race
- (27) a. John **was too shy** to speak up in class.
b. \vdash John did not speak up in class.
- (28) a. John **was not too shy** to speak up in class.
b. \nvdash John spoke up in class.

Laiminlyödä/neglect in (23)-(24) is a two-way polarity-reversing implicative (23)-(24); *epäröidä/hesitate* in (25)-(26) and *be too shy* in (27)-(28) are both one-ways. Note that one-way polarity reversing implicatives come in two types:

- the *hesitate* or “-+” type, where a negative assertion entails the complement, but not the reverse, as in (25)-(26)
 - These presuppose that their highlighted condition is causally necessary for the negation of the complement: $C \models_D \neg X$
 - A negative assertion tells us $\neg C$, so we are forced to conclude $\neg\neg X$, and $\neg I(X) \vdash X$
 - If C is met, we don’t learn anything about X
- the *too Y to X* or “+-” type, where a positive assertion entails negation of the complement, as in (27)-(28)
 - These presuppose that the absence of C is causally necessary for the complement: $\neg C \models_D X$
 - A positive assertion gives us C , which precludes X , so $I(X) \vdash \neg X$
 - $\neg C$ does not inform us about X

The two-way polarity-reversers can, in theory, be captured by adding a circumscriptive presupposition as before (to either case). There is some evidence that we should take the +- type as “basic”:

- (29) John **was** not **too embarrassed** to ask for help.
 \leadsto *John asked for help.*

Where the negation “+-” implicative (like the “-” *be able*) often/typically implicates X (in the absence of a blocking context), positive assertions of the “-+” types in (30)-(31) seem almost to default in the other direction.

- (30) John **hesitated** to ask for help
 a. \leadsto *John asked for help (after some time).*
 b. \leadsto *John didn’t ask for help (because he lost the opportunity).*
- (31) Hän **ujostel-i** näyttä-ä kuva-a-nsa minu-lle
 he.NOM shy-PST.3sg show-INF picture-POSS-PART* me-ILL
 ‘He was shy of showing his picture to me’
 a. \leadsto *He showed me his picture (reluctantly).*
 b. \leadsto *He didn’t show me the picture (because of his shyness).*

We can get either the a or b implicatures by supplying the right sort of context – the former seem slightly more dominant without context.

These extensions are formally neat, but what do they mean?

- As “-” implicatives are often about attributes or resources that must be present in sufficient quantity to enable X , “+-” implicatives are about attributes that must not exceed a certain quantity (*too Y to X*)

- Circumscribing specifies that the only open question regarding X was whether or not the quantity of Y exceeded this limit (conceptually similar to the non-reversing cases)
- Is this a reasonable description of two-way polarity reversers like *neglect*? (*Fail* may be the converse of *manage* and a special case)

Relatedly, what is different about the “-+”/*hesitate* implicatives?

- Examples in Finnish include *ujostella*(=be.shy), *häikäillä*(=have.scruples), and *empiä*(=be of two minds)
- These seem to be about attributes which *could* present an obstacle, but don’t carry with them a notion of threshold

The causal framework adopted by Baglini & Francez and used here seems insufficiently fine-grained as formulated to capture these generalizations.

Final points:

- Some simple modifications of the basic proposal in Baglini & Francez allow us to capture non-reversing implicatives as a class, and this is supported by data from Finnish and English
- The framework and modifications seem promising with respect to capturing polarity-reversing implicatives as well
- Polarity-reversing implicatives open up some interesting questions about how specific we can be about the content of conditions (and the logical consequences of this specificity)
- Can we/ought we to include the details of these generalizations (once we are clear on them) in an account of implicatives as a whole?

References

- [1] Baglini, Rebekah and Itamar Francez. 2013. The implications of managing. Ms, University of Chicago.
- [2] Bhatt, Rajesh. 1999. Ability modals and their actuality entailments. In *Proceedings of WCCFL 17*. Stanford: CSLI.
- [3] Flint, Aili. 1980. Semantic structure in the Finnish lexicon: verbs of possibility and sufficiency. PhD, Columbia University.
- [4] Karttunen, Lauri. 1971. Implicative verbs. *Language* 47: 340–358.
- [5] Karttunen, Lauri. 2012. Simple and phrasal implicatives. In *Proceedings of *SEM: The first joint conference on lexical and computational semantics*: 124–131.
- [6] Kiparsky, Paul and Carol Kiparsky. 1970. Fact. *Progress in linguistics*, ed. by Bierwisch & Heidolph. The Hague: Mouton.
Potts, Christopher. 2005. *The logic of conventional implicatures*. Oxford: Oxford University Press.
- [7] Tonhauser, Judith, David Beaver, Craige Roberts, and Mandy Simons. 2013. Toward a taxonomy of projective content. *Language* 89: 66–109.
- [8] Schulz, Katrin. 2011. If you’d wiggled A, then B would’ve changed. *Synthese* 179: 239–251.