

Towards a Solution to the Proviso Problem

Julia Zinova, Moscow State University

1. Presupposition

A sentence A presupposes a proposition p if p must be true in order for A to have a truth-value. Presuppositions are preserved under negation, in questions and *if*-clauses (“S-family” sentences).

Some examples of presupposition under different triggers (definite descriptions, factive verbs, aspectual verbs/adverbs):

- (1) a) John knows that it's raining.
- b) John doesn't know that it's raining.
- c) Does John know that it's raining?

Presupposition: It's raining.

- (2) a) John will bring his laptop.
- b) John won't bring his laptop.
- c) Will John bring his laptop?

Presupposition: John has a laptop.

- (3) a) John stopped smoking.
- b) John didn't stop smoking.
- c) Did John stop smoking?

Presupposition: John used to smoke.

A sentence with presupposition p is uttered felicitously if and only if p is in the common ground.

But when it is not so, an accommodation can happen: an additional inference (p is true) will arise. Example:

- (4) John's sister will pick him up at the airport.

Presupposition: John has a sister.

A hearer may be unaware of that John has a sister, so the presupposition of the sentence won't be satisfied by common ground, but there won't be a failure: the hearer will immediately add the information about John's sister in his world knowledge and it will become a part of the common ground. Compare this situation to one where the hearer knows that John doesn't have a sister: uttering (4) will cause a presupposition failure and won't be interpreted. A possible reaction of the hearer in this situation can be

- (5) Wait a minute! John doesn't have a sister!

Sentences like (5) are used to test (together with the S-family sentences) if some part of the meaning is a presupposition (it's called a “Wait a minute!” test). They can not be uttered with a negation of the assertive component of the sentence:

- (6) *Wait a minute! She won't pick him up!

2. The Projection Problem

The Projection Problem is a problem of predicting the presupposition of a complex sentence in a compositional way from the presuppositions of its parts. Simple example:

- (7) a) The king has a son.
- b) The king's son is bald.
- c) If the king has a son, his son is bald.

All of (7a), (7b), (7c) presuppose that there is a king, but (7c) doesn't presuppose that the king has a son (a presupposition of the right-hand constituent). What are the general rules that account to this and analogous cases?

3. The Proviso Problem

Let's look at some examples:

- (8) a) If the problem was difficult, somebody solved it.
- b) If the problem was difficult, it wasn't John who solved it.
- c) I know that if the problem was difficult, somebody solved it.

(8a) has no presupposition, (8b) presupposes that somebody solved the problem, (8c) presupposes that if the problem was difficult, somebody solved it, but does not presuppose that somebody solved the problem.

This Proviso Problem initially was raised in connection with Heim's account, which predicted the same presupposition for (8b) and (8c).

Some more examples:

- (9) If John is a scuba diver, he'll bring his wet suit. \neq John has a wet suit.
- (10) If the weather is good, John will bring his wet suit. Presupposition: John has a wet suit.
- (11) I know that if John is a scuba diver, he'll bring his wet suit. Presupposition: If John is a scuba diver, he has a wet suit.
- (12) I know that if the weather is good, John will bring his wet suit. Presupposition: John has a wet suit.

There are different possible ways to explain such examples. Let's look at them carefully.

4. Previous accounts

4.1. Karttunen's (1973, 1974) approach

Karttunen's approach is semantic and trivalent. That means that presupposition is a semantic relation between propositions and must be backgrounded for sentence to have a truth-value.

In his 1973's paper he proposes a solution to the Projection Problem by defining special rules of keeping and filtering presuppositions of the parts to get the presupposition of the whole sentence. These rules form part of the meaning of a word. In particular, he thinks that such connectives as *if ... then* do not introduce any new presuppositions, and gives the following projection rule:

- (13) The presuppositions of "If A then B" (with respect to context X) consist of
- a) all of the presuppositions of A (with respect to X) and
 - b) all of the presuppositions of B (with respect to $X \cup A$) except for those entailed by the set $X \cup A$ and not entailed by X alone.

In the 1974 paper, Karttunen reformulates the question; instead of compiling the presuppositions of the complex sentence, he suggests to find out what a context should look like to satisfy these presuppositions. So he elaborates the notion of satisfaction:

- (14) Context X *satisfies-the-presuppositions-of* A just in case X entails all of the basic presuppositions of A (that is, $P_A \subseteq E_X$).

As for the conditionals, he gives the following rule:

- (15) Context X *satisfies-the-presuppositions-of* "If A then B" just in case
- a) X *satisfies-the-presuppositions-of* A, and
 - b) $X \cup \{A\}$ *satisfies-the-presuppositions-of* B.

This leads to the notion of a local context:

- (16) In compound sentences, the initial context is incremented in a left-to-right fashion giving for each constituent sentence a *local context* that must satisfy its presuppositions.

So the projection problem transforms to a problem of characterization how the context is changed by the utterances of the complex sentences, what is a contribution of each part and which stage in the context updating is relevant for the admittance conditions of each elementary constituent.

The main point which is relevant for current paper is that in both approaches Karttunen postulates that an if-sentence have only "simple", unconditional presuppositions.

4.2. Karttunen & Peters's 1979 approach

"Plugs, Holes, and Filters" approach included the following rule for conditional sentences (now and further we'll use such notation: if p is a proposition, then p' is its assertion and \underline{p} – its presupposition):

- (17) If A has p' as its content and \underline{p} as its presupposition, and B has content q' and presupposition \underline{q} , then the presupposition of *If A, B* is the proposition $\underline{p} \ \& \ (p' \rightarrow \underline{q})$.

4.3. Stalnaker's 1974 approach

Stalnaker gives a pragmatic analysis of presupposition. That means we do not have any special part of meaning, but we rather look at the situation and speaker's intentions to define the presupposition of the sentence. He provides the following notion:

- (18) A proposition P is a pragmatic presupposition of a speaker in a given context just in case the speaker assumes or believes that P , assumes or believes that his addressee assumes or believes that P , and assumes or believes that his addressee recognizes that he is making these assumptions, or has this beliefs.

As for conditional sentences, Stalnaker doesn't provide new predictions but rather explains Karttunen's rule in a pragmatic way.

4.4. Gazdar's 1979 approach

Gazdar attempts to build a more explanatory but semantic theory: he claims that we don't need to keep the projection rule as a part of the meaning of a word. So he proposes an approach, based on

cancellation:

- (19) a) any sentence, whatever its complexity and its structure, simply presupposes all the presuppositions of its elementary constituent sentences;
- b) if adding a presupposition to the common ground leads to a contradiction, it must be canceled.

4.5. Heim's 1983 approach

In her 1983 paper, Heim criticizes Gazdar's results for presupposition projection, providing the following examples:

(20) If John has children then Mary will not like his twins.

(21) If John has twins then Mary will not like his children.

(21) seems to presuppose nothing, while (20) is strange unless we assume that if a person has children, he must have twins. Gazdar's theory, however, doesn't give any presupposition for (20) and predicts that (21) must presuppose that John has children. So Heim admits that Karttunen & Peters's approach predict the right result ($\underline{p} \ \& \ p' \ \rightarrow q$), but wants to build a theory that has an explanatory power. She adopts the notion of local context (16), used in (Karttunen 1974) and postulates that every lexeme has a Context Change Potential (henceforth CCP) which cannot be derived from other properties of a lexeme, but on the basis of which the truthconditional aspect of the meaning can be predicted. So far the CCP of "if" is like in (22).

(22) $c + \text{If } A, B = c \cap (c + A \cap c + A + B)$

4.6. Singh's 2007 approach

Singh proposes a solution to the Proviso Problem in terms of not what a presupposition will be like, but what accommodation we will make if it is not satisfied. He observes that "Satisfaction theories" do not predict unconditional presuppositions while "Cancellation theories" never get a conditional one and formulates the Proviso Problem as a problem of characterization of strengthening mechanism (function P):

(23) When the semantics generates conditional presuppositions [if f, then X], is there a characterization of P that can predict when conditional presuppositions can and cannot be strengthened and, when they can, when they will and when they will not be strengthened and, when they are be strengthened, what exactly they will be strengthened to?

He constructs a mechanism that generates Hypotheses Space:

(24) Suppose that complex sentence S contains embedded in it sentence $y(X)$, and that S is uttered in context c. Suppose further that $L(y(X), S, c) = c[f_1]...[f_k]$, where $k \geq 0$. Then the hypothesis space for accommodation (into c) is: {if f_1 and ... and f_k then X, if f_1 and ... and f_{k-1} then X, ..., if f_2 and ... and f_k then X, ..., if f_k then X, X}.

After getting the Hypotheses Space he simply takes the more plausible variant.

4.7. Conclusion

I did not describe many other theories, but they are in essential part identical. The main thing remaining through years: satisfaction theories start from conditional presupposition and have a strengthening mechanism, binding/cancellation theories have only unconditional presuppositions which can be canceled and placed in the different places inside the sentence.

From all this I adopt two main points:

- 1) we start with something conditional;
- 2) the presupposition is really a bounded thing.

But in my opinion all existing theories have the wrong notion of what a conditional presupposition is.

5. My proposal

5.1. Intuition

We have a sentence *If p(a), q(a)*. What does it mean that context, updated with $p(a)$, entails $q(a)$? This means that we already have in mind the notion of some relation between p and q , and here comes what is essential: this relation must be not between $p(a)$ and $q(a)$, but rather between the very p and q , which can be expressed in the following form: $\forall x (p(x) \rightarrow q(x))$. Why? Consider, for example, sentence (9)

(9) If John is a scuba diver, he will bring his wet suit.

It seems very strange to accommodate (if the presupposition is not satisfied) that it is John who, if he is a scuba diver, has a wet suit. A much more natural statement is “if someone is a scuba diver, he must have a wet suit” (and this together with local update that John is a scuba diver will give us a fact that he must have a wet suit – like Modus Ponens rule). This reasoning works also for sentences where this implication is not an ordinary fact about the world which everyone knows. Consider (25)

(25) Mary is 64 years old and her boss knows that she can / cannot be fired.

If we don't know anything else about Mary (if we know, we will add it; also we can add gender information **if** we know that (26) it is not true for men) (26) is a more plausible thing to accommodate than “If Mary is 64, she can/ cannot be fired”

(26) $\forall x (x \text{ is 64 years old} \rightarrow x \text{ can/cannot be fired})$

I argue that there exist two types of conditional presuppositions: universal and individual ones. Universal presuppositions are checked before unconditional ones, while individual – after, which helps us to construct a mechanism of deriving what the presupposition of a conditional sentence is.

5.2. The Mechanism

So far, we get that presuppositions of conditional sentences (*If p(a), q(a)*) can be of three different types:

1. Universal Conditional Presupposition (UCP): $x (p(x) \rightarrow q(x))$

1'. If there is some additional information about a , it must be true for x . For example, if $c \models g(a)$, then after checking a simple UCP (if it contradicts the world knowledge) we should check a UCP': $\forall x ((p(x) \& g(x)) \rightarrow q'(x))$ and so on.

2. Individual Unconditional Presupposition (IUP): $q(a)$

3. Individual Conditional Presupposition (ICP): $p(a) \rightarrow q(a)$

So the mechanism goes through alternatives from the strongest (universal statement about the world) to the weakest (conditional statement about one individual).

In a simple case when we don't know anything about an individual a , the mechanism is the following: UCP is preferable (because it's stronger) but if it contradicts what is entailed by the context, we abandon it and say that it is an IUP that is indeed presupposed. If IUP contradicts what is entailed/conversationally implicated by the sentence, our last chance to save the sentence is to suggest that it's presupposition is conditional and individual one. If this also contradicts world knowledge (for example, if $c \models \forall x (p(x) \rightarrow \sim q(x))$ we get a failure (#). The more accurate version (if we have some additional information) involves applying rule (1') all the way before we reach an IUP and can stop on any step.

Note, that for sentences with conjunction the mechanism is the same except that we never need the last step.

5.3. How it works

Let me illustrate my claim using all previous and some new (borrowed from different literature) examples of conditional sentences:

(7c) If the king has a son, his son is bald.

+ Potential UCP: $\forall x (x \text{ has a son} \rightarrow x \text{ has a son})$ – this is a tautology \rightarrow we accept it \rightarrow no presupposition.

- Potential IUP: the king has a son (not used because UCP is accepted).

- Potential ICP: if the king has a son, he has a son.

(8b) If the problem was difficult, it wasn't John who solved it.

- Potential UCP: $\forall x (x \text{ is a difficult problem} \rightarrow x \text{ was solved})$ – this contradicts our world knowledge ($c \models \exists x (x \text{ is a difficult problem} \ \& \ x \text{ was not solved})$).

+ Potential IUP: somebody solved the problem – this is the presupposition we get.

- Potential ICP: if the problem was difficult, somebody solved it.

(9) If John is a scuba diver, he'll bring his wet suit.

+/- Potential UCP: $\forall x (x \text{ is a diver} \rightarrow x \text{ has a wet suit})$ – this is a part of our world knowledge, so it has to be not contradictory. There is also another reading available: we can assume that this sentence means something like "If John goes for this trip to dive and not to lie in the sun, he will bring his wet suit." Under this reading UCP is accepted if we don't have more information, but if we know, for example, that there is a rent office working where people take wet suits to go diving, UCP becomes contradictory to the context and we pass to the IUP.

-/+ Potential IUP: John has a wet suit (accepted under second reading with additional information).

-/- Potential ICP: If John is a scuba diver, he has a wet suit.

(10) If the weather is good, John will bring his wet suit.

- Potential UCP: $\forall x (\text{the weather is good} \rightarrow x \text{ has a wet suit})$ – this is contradictory.

+ Potential IUP: John has a wet suit – this is the presupposition we get

- Potential ICP: If the weather is good, John has a wet suit.

(20) If John has children then Mary will not like his twins.

- Potential UCP: $\forall x (x \text{ has children} \rightarrow x \text{ has twins})$ – this contradicts our world knowledge,

so we pass to the IUP.

- Potential IUP: John has twins – this contradicts the conversational implicature that the speaker does not know whether John does or does not have children.

+ Potential ICP: if John has children, he has twins – this is the presupposition we get. It is a very weak statement, that's why it's hard to accept the whole sentence.

(21) If John has twins then Mary will not like his children.

+ Potential UCP: $\forall x (x \text{ has twins} \rightarrow x \text{ has children})$ – this is a tautology, so we accept it and end up with no presupposition.

- Potential IUP: John has children.

- Potential ICP: If John has twins, he has children.

(25) Mary is 64 years old and her boss knows that she can / cannot be fired.

+/- Potential UCP: $\forall x (x \text{ is 64 years old} \rightarrow x \text{ can/cannot be fired})$ – this is not contradictory – we accommodate it (but if we have some other relevant facts in the context which lead to the contradiction, we can obtain the IUP).

-/+ Potential IUP: Mary can/cannot be fired.

(27) If John flies to Toronto, his sister will pick him up at the airport.

- Potential UCP: $\forall x (x \text{ flies to Toronto} \rightarrow x \text{ has a sister})$ – this is contradictory, so we pass to the IUP.

+ Potential IUP: John has a sister – this is the presupposition we get.

- Potential ICP: if John flies to Toronto, he has a sister.

(28) Fred hates sonnets and so does his wife

- Potential UCP: $\forall x (x \text{ hates sonnets} \rightarrow x \text{ has a wife})$ – this is contradictory, so we pass to the IUP.

+ Potential IUP: John has a wife – this is the presupposition we get.

(29) If none of Mary's friends come to the party, she'll be surprised that her best friends aren't there.

+ Potential UCP: $\forall x (\text{none of } x\text{'s friends come to the party} \rightarrow x\text{'s best friends are not at the party})$ – this is a tautology \rightarrow no presupposition.

- Potential IUP: Mary's best friends are not at the party.

- Potential ICP: If none of Mary's friends come to the party, Mary's best friends are not at the party.

(30) If John is munching his way through a packet of biscuits, then Bill will be glad that John is eating something.

+ Potential UCP: $\forall x (x \text{ is munching a packet of biscuits} \rightarrow x \text{ is eating something})$ – this is a tautology \rightarrow no presupposition.

- Potential IUP: John is eating something.

- Potential ICP: If John is munching a packet of biscuits, he is eating something.

(31) If John is incompetent, he knows that he is.

+ Potential UCP: $\forall x (x \text{ is incompetent} \rightarrow x \text{ is incompetent})$ – this is a tautology \rightarrow no

presupposition.

- Potential IUP: John is incompetent – we do not reach this.

- Potential ICP: If John is incompetent, John is incompetent.

(32) If John is realistic, he knows that he is incompetent.

- Potential UCP: $\forall x (x \text{ is realistic} \rightarrow x \text{ is incompetent})$ – this contradicts with $c \rightarrow$ we move to the IUP.

+ Potential IUP: John is incompetent – this is the presupposition we get.

- Potential ICP: If John is realistic, he is incompetent.

(33) John works for Morgan Stanley and his limo is parked outside.

+/- Potential UCP: $\forall x (x \text{ works for Morgan Stanley} \rightarrow x \text{ has a limo})$ – this is generally acceptable, we can accommodate this, but if we don't believe such a fact, we pass to the IUP.

-/+ Potential IUP: John has a limo – this is the presupposition we get in this case.

(34) It's sunny in Stanford and John's limo is parked outside.

- Potential UCP: $\forall x (\text{it's sunny in Stanford} \rightarrow x \text{ has a limo})$ – this is contradictory.

+ Potential IUP: John has a limo – this is the presupposition we get.

(35) If Bill Gates collects cars, he will take a good care of his Rolls Royces.

-/- Potential UCP: $\forall x (x \text{ collects cars} \rightarrow x \text{ has Rolls Royces})$ – this is contradictory, but we can add information we know about Bill Gates.

+/- Potential UCP': $\forall x ((x \text{ collects cars} \ \& \ x \text{ is very rich}) \rightarrow x \text{ has Rolls Royces})$ – we can accommodate this or pass to the IUP.

-/+ Potential IUP: Bill Gates has Rolls Royces.

-/- Potential ICP: If Bill Gates collects cars, he has Rolls Royces.

(36) If John collects cars, he takes a good care of his Rolls Royces.

- Potential UCP: $\forall x (x \text{ collects cars} \rightarrow x \text{ has Rolls Royces})$ – this is contradictory and we don't have any information to add.

+ Potential IUP: John has Rolls Royces.

- Potential ICP: If John collects cars, he has Rolls Royces.

(37) If the thief stole his Mac, John will ensure his next one.

+/- Potential UCP: $\forall x (x\text{'s Mac is stolen} \rightarrow x \text{ will have a new Mac})$ – we can accommodate this. But suppose we know Bill that has a Mac but hates it and never will buy a new one. Then we can pass to the IUP.

-/- Potential IUP: John will have a new Mac – this contradicts the implicature that we don't know if John's Mac was stolen or everything is ok and he doesn't need a new one. So we pass to the ICP.

-/+ Potential ICP: If the thief stole his Mac, John will have a new one.

6. Remarks

This is a very rough version of my account, much more needs to be said and clarified, the rules must be written more formally and accurate. But the main point that is captured by this proposal is that in many cases conditional presuppositions are not the facts of implication, concerning one individual, but rather the general statements about the world. This property is reflected in the universal quantifier and provides an explanation why they are in fact stronger, but not weaker, than unconditional ones.

7. Literature

1. Chemla, E.: 2008a, "Presuppositions of quantified sentences: Experimental Data." Under revision for Natural Language Semantics.
2. Chemla, E.: 2008b, "Similarity: Towards a unified account of scalar implicatures, free choice permission and presupposition projection." Under revision for Semantics and Pragmatics.
3. Gazdar, Gerald, 1979. "Pragmatics: Implicature, Presupposition and Logical Form." Academic Press, New York.
4. George, B.: 2008 "Presupposition Repairs: A Static, Trivalent Approach to Predicting Presupposition." MA thesis, UCLA. Available on Semantics Archive at <http://semanticsarchive.net/Archive/2ZiYmEyN/>
5. Geurts, Bart: 1996, "Local Satisfaction Guaranteed: A Presupposition Theory and its Problems." *Linguistics and Philosophy* 19, 259–294.
6. Heim, Irene, 1982. "On the Semantics of Definite and Indefinite Noun Phrases." Ph.D. thesis, University of Massachusetts at Amherst.
7. Heim, I.: 1983. "On the Projection Problem for Presuppositions." In D. Flickinger et al. (eds), *Proceedings of the Second West Coast Conference on Formal Linguistics*, 114-125.
8. Heim, I.: 1990. "Presupposition Projection." In Rob van der Sandt (ed.), *Reader for the Nijmegen Workshop on Presupposition, Lexical Meaning, and Discourse Processes*, University of Nijmegen.
9. Karttunen, L.: 1973. "Presuppositions of Compound Sentences." *Linguistic Inquiry* 4: 169-193.
10. Karttunen, L.: 1974. "Presuppositions and Linguistic Context." *Theoretical Linguistics* 1: 181-194.
11. Karttunen, L. and Peters, S.: 1979. "Conventional Implicature." In Choon-Kyu Oh and David Dineen (eds.), *Syntax and Semantics 11: Presupposition*, 1-56, Academic Press, New York.
12. van Rooij, R.: 2007. "Strengthening Conditional Presuppositions." *Journal of Semantics* 24, 289–304.
13. Rothschild, D.: "Transparency Theory and its Dynamic Alternatives." To appear in *Theoretical Linguistics*.
14. Schlenker, P.: 2008a. "Local Contexts." Accepted for publication with revisions in *Semantics & Pragmatics*.
15. Schlenker, P.: 2008b. "Presupposition Projection: the New Debate." Manuscript, Institut Jean-Nicod & NYU.
16. Schlenker, P.: "Be Articulate: A Pragmatic Theory of Presupposition Projection."

17. Singh, R.: 2007. "Formal Alternatives as a Solution to the Proviso Problem." *Proceedings of Semantics and Linguistic Theory 2007*.
18. Soames, S.: 1982. "How Presuppositions Are Inherited: A Solution to the Projection Problem." *Linguistic Inquiry* 13, pp. 483-545.
19. Stalnaker, R.: 1974. "Pragmatic presuppositions." In Milton Munitz and Peter Unger (eds.), *Semantics and Philosophy*, pp. 197-214, New York University Press.