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Abstract: It is a common intuition that the antecedent of an indicative conditional should have something to do with its consequent, that they should be somehow connected. In fact, many conditionals sound unacceptable precisely because they seem to suggest a connection which is not there. Although the majority of semantic theories of conditionals treat this phenomenon as something pragmatic, for instance, something that is conversationally implicated, no one has offered a full-fledged pragmatic explanation of why missing-link, and, in particular, false-link conditionals strike us as odd. The aim of this paper is to explore the possibility that the link is an example of a conversational implicature. We discuss possible tests one can employ to identify conversational implicatures, and, ultimately, we show that the connection between a conditional's antecedent and consequent fails them all.

Keywords: indicative conditionals; conversational implicature; pragmatics.

1 Odd conditionals

It is a common intuition that antecedents of indicative conditionals should have something to do with their consequents, that they should be somehow connected. Conditionals that lack a connection, so called missing-link conditionals, tend to strike us as defective (see, e.g., Douven 2017; Skovgaard-Olsen et al. 2017). Moreover, an assertion of "if φ then ψ" usually communicates that φ and ψ are related.[1] Few philosophers or linguists would openly disagree with this statement, given that its loose formulation does not commit one to any particular view on the nature of such a link.

But what if a purportedly true conditional conveys a connection, but it is a kind of connection whose existence would be rational to deny? Consider the sentence:

(1) *If dolphins have fins, then they can't breathe under water.*

In this example, both the antecedent, "dolphins have fins," and the consequent, "dolphins can't breathe under water," are true, hence the most prominent theories of conditionals render the conditional true (e.g., Stalnaker 1968; Jackson 1987; Grice 1989), or, if they deny that conditionals can have true values at all, highly acceptable (e.g., Adams 1975; Edgington 1995; Bennett 2003).[2] Yet we may be inclined to reject the conditional because it suggests some sort of an evidential or inferential relation between having fins and the inability to extract oxygen from water – a relation which, we may believe, does not hold. We will call this subspecies of missing-link conditionals *false-link conditionals*.

One way to account for the oddity of false-link conditionals is to demand the presence of, e.g., an inferential or causal relation between antecedents and consequents for conditionals to be true or acceptable (e.g., Douven 2008; Krzyżanowska et al. 2014; Skovgaard-Olsen 2016; Douven et al. 2018; van Rooij and Schulz

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[1] For a discussion of different ways such a connection can be understood, see, among others, Declerck and Reed 2001; Bennett 2003; Verbrugge 2007; Krzyżanowska et al. 2013; Skovgaard-Olsen 2016.

[2] See Bennett (2003) for a comprehensive introduction to different philosophical theories of conditionals, and Unterhuber (2013) for a discussion of different logics of conditionals.

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2018). The connection is then understood as a part of *what is said* – a conventional, or even truth-conditional content of a conditional, hence sentences such as (1) come out as unacceptable or false. The majority of theories, however, exclude the connection from the realm of semantics, and relegate the explanation of the oddity of missing-link conditionals to pragmatics. On those accounts, if we find (1) odd, it is not because it is false or unbelievable. It is because it would be a truly bizarre thing to say.

Grice (1989) famously proposed an account of the unassertability of missing-link conditionals in which the missing link plays no explanatory role. Although aimed at defending the material account, Grice's argument can be easily applied to serve all theories that validate an inference of a conditional from the truth of its clauses (such as Stalnaker's or the Suppositional Theory), consequently rendering sentences such as (1) true or highly acceptable. Grice's argument hinges on an observation that in such cases, the speaker is warranted to assert something more informative than the conditional, for instance, the conditional's consequent alone, or the conjunction of the antecedent and consequent. Uttering a conditional is then a violation of one of the maxims of good conversation, the first Maxim of Quantity: "Make your contributions as informative as required for the current purposes of the exchange."[3]

Grice's account, although successfully preventing us from asserting conditionals which are indeed strange, forces us to reject many sentences that appear perfectly appropriate, such as:

(2) *If dolphins have no gills, then they can't breathe under water.*

Since both (1) and (2) have a true antecedent and a true (shared) consequent, on Gricean grounds, they should be equally unassertable. But, unlike (1), (2) seems fine. After all, we can imagine a classroom context in which a teacher utters this conditional to make their pupils understand the relationship between the anatomy and physiology of dolphins. The only difference between these two sentences is that the antecedent and consequent of (2) are reasonably connected while in (1) they are not: there is a clear link between having no gills and the inability to breathe under water, but having fins, if anything, could be taken as (moderately strong) evidence for an animal's being able to breathe under water. Therefore, someone asserting (1) would suggest a wrong relationship. Any satisfactory account of the oddity of missing-link conditionals needs to be able to explain the difference between such sentences. To achieve that, we need to explain why conditionals seem to convey a connection in the first place.

What are our options if we do not want to endorse a semantics on which the presence or absence of a connection determines a conditional's acceptability or truth value? As we have mentioned, a common strategy is to view the link, however we construe it exactly, as a pragmatic phenomenon. But this, on its own, is not an explanation yet. Unless we want to treat pragmatics as a dustbin into which we throw everything that does not accord with our theories, we need to have a story explaining why conditionals seem to communicate the existence of a connection between their clauses and why, when no such link can be established, the conditional appears defective.

2 Under the rug of pragmatics

One of the problems with the strategy of sweeping the link between antecedents and consequents under the rug of pragmatics is that it is not entirely clear where the boundary between the rug and the rest of the floor actually is. In fact, it has been observed that the binary distinction between semantics and pragmatics seems too simplistic to capture the complexity of linguistic meaning.[4] Nevertheless, most linguists, philosophers, and psychologists of reasoning seem to agree that, among the potentially many aspects of meaning, there is something that could be considered the conventional, *core*, or *semantic* content of a sentence, that is, what is literally said, which might be different than what a speaker *conversationally implicates* by uttering given

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3 For a detailed introduction to Grice's theory and its more recent developments, see, e.g., Levinson (2000); Birner (2013).
4 For more complex models of meaning, see, e.g., Levinson (2000); Jaszczolt (2005); Pagin and Pelletier (2007); Recanati (2010).

sentence in a particular context. The existence of phenomena such as *conventional implicatures* or *presup-positions* complicates the matter. While they do not contribute to the truth-conditional content of sentences they appear in, they are carried by particular linguistic expressions and thus are conventional in nature: they might be construed as belonging to what is said (Bach 1999; Beaver and Geurts 2014).

The claim that the oddity of missing-link conditionals is a pragmatic phenomenon may therefore mean different things. In this paper, we will limit our consideration to one possibility. Since the classification of the conversational implicatures as pragmatic is relatively uncontroversial, we will focus here on a suggestion that what is wrong with false-link conditionals is that they carry false conversational implicatures.[5]

3 Testing for conversational implicature

Grice (1989) introduced the notion of a conversational implicature to denote the kind of information that does not belong to the literal meaning of an expression, but it is something a given speaker may want to communicate by means of that expression in a particular context. But what exactly distinguishes conversational implicatures from other linguistic phenomena? The literature suggests a number of characteristics that could serve as tests for recognising if an aspect of meaning conveyed by an expression is conversationally implicated. Sadock (1978) and Birner (2013: Ch. 2.3) list the following features:

(i)   calculability
(ii)   cancellability
(iii)   reinforceability
(iv)   indeterminacy
(v)   nondetachability
(vi)   nonconventionality
(vii)   "not [being] carried by what is said, but only by the saying of what is said."

However, as pointed out by Sadock (1978), of these characteristics only calculability is a necessary property of conversational implicatures. But it is also "trivially necessary since nearly anything can be 'worked out' with the aid of the Cooperative Principle on the basis of nearly any meaning in some context" (Sadock 1978: 295). It cannot then serve as a test for recognising conversational implicatures.

Indeterminacy, by contrast, seems entirely inadequate, since some conversational implicata seem to be determinate while there are indeterminate aspects of conventional meaning, such as the reference of pronouns or demonstratives.

Another candidate for a test, nondetachability, devised to distinguish between conversational and conventional implicatures, turns out to require presupposing what it is supposed to be a test for (Sadock 1978: 287–290). In particular, a meaning M conveyed by an expression X is conventionally implicated if it is not conveyed by Y, a paraphrase of X. But the observation that Y does not carry M might be used as evidence that Y is not a paraphrase of X at all. Consequently, to apply the nondetachability test to the connection in (1) we would need to establish what counts as its paraphrase, and to achieve that, we would have to know if the connection belongs to its conventional meaning. And if we knew that, we would not need any tests. Moreover, if we find a candidate paraphrase of (1) that does not commit the speaker to there being a connection between having fins and breathing under water, we could argue that the two phrasings are not equivalent at all. In other words, trying to apply the test means running round and round in circles.

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5 Grice himself was of the opinion that the link, or, as he puts it, "relations of inferrability" between a conditional's antecedent and consequent is not a part of the conventional meaning of a conditional, but it is *nonconventionally implicated* (Grice 1989: 76–78). Similar suggestions have been made by psychologists of reasoning such as Over et al. (2007: 92) or Johnson-Laird and Byrne (2002: 651).

The circularity of nonconventionality, when construed as a test for conversational implicature, is even more blatant (Sadock 1978: 284–285): if we knew whether a meaning M conveyed by an expression X belongs to the conventional meaning of X, we would not need to test if M is nonconventionally, that is, conversationally implicated – we would have known it already. Hence, for the nonconventionality test to tell us anything about the connection between antecedents and consequents, we would have to know beforehand if it is an aspect of the conventional meaning of the conditional, or if it is a conversational implicature. Finally, Sadock takes the characteristic (vii) to be a version of nonconventionality. However, in Section 6 we will show how it can be turned in a practical test after all.

The only characteristics that are viable candidates for practical tests are *cancellability* and *reinforceability*, and, as we will show later, a version of (vii). These three tests do not bear the marks of circularity, but neither seems to be sufficient for determining whether a meaning is an aspect of what is said or whether it is merely conversationally implicated. Nonetheless, these tests seem to be the best we have got. Surely, if the connection is a conversational implicature, it should be possible to demonstrate that it has at least some of these properties. In what remains, we will investigate if the connection is cancellable and reinforceable, and if it is carried by "the saying of what is said."

4 Cancellability

Grice (1989: 44) emphasised that conversational implicatures are defeasible, that is, they can be cancelled explicitly by a speaker or by a context. A meaning M conveyed by X is cancellable if a speaker can assert "X but I didn't mean to imply that M" and such an assertion does not sound contradictory, for example:

(3) *Some of my students passed the exam. Oh, I didn't mean to imply that some of them didn't, I just haven't checked all the exams yet.*

By contrast, a speaker cannot cancel what belongs to the semantics of their assertions or is by it semantically entailed:

(4) a. ∗ *John's brother is a dentist. Actually, John doesn't have a brother.*
    b. ∗ *Susan and Steve left the party. Oh, I didn't mean to imply that Susan left the party.*

It goes without saying that the examples in (4) are unacceptable. A speaker attempting to cancel an entailment or to deny what semantically follows would strike us as incoherent or linguistically incompetent, or, in the most charitable interpretation, as withdrawing whatever they said before. If someone actually says (4a), to make sense of the situation, we may imagine that the speaker is talking about a dentist who they used to think was John's brother, but who is in fact John's best friend. This would not be an attempt to *cancel* an entailment, however, but rather a form of an *erratum*; a statement that what they said before was wrong. We could easily imagine (4a) being followed by "I keep forgetting that the guy is not John's brother, but just his friend. They do look alike though!"

Cancellability is by far the least controversial characteristic of conversational implicatures (Sadock 1978; Blome-Tillmann 2008), although, since it applies also to other types of pragmatic inference, it does not make a decisive test. Whether it is necessary is more controversial,[6] yet it seems safe to assume that it should not be possible to cancel what an expression literally means or what it semantically entails. For this reason, finding out that the link conveyed by a conditional can be cancelled would be sufficient to support the view that it does not belong to the semantics of a conditional, but, instead, it is an aspect of its pragmatics – be it a conversational implicature, presupposition, or something different entirely.

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6 See Lauer (2013: Ch. 9) on non-optional and thus non-cancellable implicatures.

Is it possible then to assert a conditional and cancel the connection between its clauses? Consider the earlier discussed example of a false-link conditional:

(5) ∗ *If dolphins have fins, then they can't breathe under water. Oh, I didn't mean to imply that fins have anything to do with the ability to breathe under water.*

Here, the speaker's attempt to cancel the connection appears awkward. Not knowing the truth values of the clauses of the conditional, or not having an opinion about the truth value or the acceptability of the conditional does not make a difference either. To see that, consider the following dialogue:

(6) A: *If Bobby is fond of drawing, he will be good at mathematics when he goes to school.*
     B: *Why do you think that drawing a lot would help him with learning mathematics?*
     A: ∗ *Oh, I didn't mean to imply that it is because he draws a lot he will be good at mathematics. These abilities are independent.*

In this scenario, A first suggests that there is some kind of a link, possibly causal, between children's fondness of drawing and their mathematical skills. A's attempt to withdraw from this suggestion seems incoherent. One could easily imagine B responding with: "So why did you say that Bobby will be good in mathematics *if* he likes drawing?" Or even: "But this is exactly what you've just said!" If A did not mean to say that there is a connection, they should have better not used a conditional, as one cannot assert "If φ, ψ" and insist that they do not want to commit themselves to any connection between φ and ψ.[7]

One could object, nonetheless, that it is possible for a speaker to cancel the connection, if after asserting "If φ, ψ," they add "If not φ, ψ." Consider the following variant of (6):

(7) A: *If Bobby is fond of drawing, he will be good at mathematics when he goes to school.*
     B: *Well, Bobby will be good at mathematics if he is fond of drawing, and he will be good at mathematics if he is not fond of drawing.*

In the above dialogue, while B might agree with A that Bobby's fondness of drawing is a good reason to believe that he will be good at mathematics, the second conditional turns the whole statement into an assertion of the consequent.

Is that an instance of a cancellation? Clearly, B believes that Bobby is a talented kid and will be good at mathematics no matter what. What they said could be rephrased as:

(8) *Whether or not Bobby is fond of drawing, he will be good at mathematics.*

One could argue that non-interference conditionals, that is, sentences whose subordinate clauses can be introduced by "whether or not" or "even if," do not require any link between their clauses (e.g., Woods 2003: 16). But then it should be possible to say that Bobby will be good at mathematics whether or not Donald Trump is awarded the Nobel Prize in Literature, or whether or not London is the capital of the UK, and so on, but this is, as argued by Declerck and Reed (2001: 20), not the case. Furthermore, it is not uncommon to maintain that these conditionals require a separate analysis (Lycan 2001; Douven 2016).[8] In that case, if B's assertion in (7) is indeed equivalent to (8), we have no reason to consider it to be an instance of a cancellation.

Note, also, that the second conditional in B's response in (7) may only occur after the first conditional has been asserted, they only work together. B might be said to disagree with A regarding the degree to which Bobby's future mathematical abilities depend on his fondness of drawing, but they do not necessarily deny that there is some connection between the two. The second conditional only indicates that there are also other,

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7 A recent experiment by Skovgaard-Olsen et al. (2019) confirms this observation by showing that participants perceive speakers attempting such a cancellation as contradicting themselves.
8 In fact, empirical studies on non-interference conditionals in natural language give credit to such an approach (see, e.g., Declerck and Reed 2001; Douven and Verbrugge 2012).

independent reasons to believe the consequent. By contrast, if, in (7), B responded with "Bobby will be good at mathematics if he is not fond of drawing," we could talk about a genuine disagreement: B might indeed believe that, say, kids interested in visual arts tend to dislike formal sciences. Such a disagreement would not be possible if the connection communicated by a conditional was merely a conversational implicature.

5 Reinforceability

Although not discussed by Grice at all, reinforceability makes another practical test for the presence of a conversational implicature. As explained by Sadock (1978: 294), "since conversational implicatures are not part of the conventional import of utterances, it should be possible to make them explicit without being guilty of redundancy." Consequently, the implicatures from the example (3) can not only be cancelled, but also reinforced:

(9) a. *Betty and Mike have a son. In fact, he is their only child.*

   b. *Some of my students passed the exam. Not all of them did though.*

In both of the above examples, the second sentence states something that is already implicated by its predecessor. Yet spelling out these implicatures does not give rise to an impression that the speaker repeats themselves. By contrast, sentences that are semantically entailed by the preceding elements of discourse seem redundant:

(10) a. ∗ *John's brother is a dentist. Actually, John has a brother.*

   b. ∗ *Susan and Steve left the party. In fact, Susan left the party, too.*

Can the connection be reinforced? Take an example of a conditional that conveys a reasonable link between its clauses:

(11) ∗ *If Dolphins have no gills, then they can't breathe under water. Actually, dolphins inability to breathe under water is related to their having no gills.*

A speaker trying to make the connection explicit sounds like they are repeating themselves.[9] We can also envisage a version of (6) developing as follows:

(12) A: *If Bobby is fond of drawing, he will be a good student when he goes to school.*
   B: *Oh?*
   A: *Yes, Bobby's fondness of drawing is why he will be a good student.*
   B: *Well, I heard what you said, but why do you think so?*

Note that the sentences meant to reinforce what a conditional already conveys sound somewhat clumsy. That may be because a conditional itself is the best way to express that there is a connection between two propositions; it is unsurprising then that any other way to state that there is such a connection sounds less felicitous.

6 "Not being carried by what is said…"

The connection between a conditional's antecedent and its consequent is neither cancellable, nor reinforceable. Moreover, we followed Sadock in claiming that no other property of conversational implicatures makes

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9 This observation has been confirmed in an empirical study by Rostworowski et al. (2016).

a practical test for detecting their presence. With one exception: the property of "not [being] carried by what is said, but only by the saying of what is said."

According to Sadock (1978: 285), this is just a version of nonconventionality, and as such, it is circular and therefore useless. But one could read the passage as a suggestion of a thought experiment that could be performed to establish if an aspect of meaning *M* conveyed by an expression *X* only arises when someone asserts *X* in a particular context, or if it accompanies *X* outside of any context of utterance, too. Such a thought experiment, of course, is only a way to examine our linguistic intuitions, but so is, after all, any other test we discussed.

Let us explain how such a test could work. Consider the sentence:

(13)   *Betty and Mike have a son.*

As we showed earlier, (13) can implicate that Betty and Mike's son is their only child. But imagine that you find this sentence written on a slip of paper. You do not know who wrote it, for whom it was meant, and what was the context in which it has been produced. How would you interpret it then? Most likely, you would read the sentence as communicating that Betty and Mike, whoever they are, have at least one child, and that their child is a boy, but you would not infer that they have no other children. They might have a daughter, but in the context in which the sentence has been written, only male offspring might have been relevant. Or maybe they even have more sons, but the slip of paper is meant to announce the sex of their newborn. The possibilities abound.

By contrast, if we find an anonymous note saying *Alice is poor but honest*, we might wonder why the author of the note sees a tension between being poor and honest. We do not need to know anything about the context the note was produced in to understand the conventional meaning of *but*, as we do not need to know the circumstances in which the sentence *Susan and Steve left the party* was asserted to get the information that Susan left the party.

Now, let us see if this test teaches us anything about conditionals. Imagine, as above, that we find the following anonymous message:

(14)   *If Bobby is fond of drawing, he will be good at mathematics when he goes to school.*

Even if we do not know who Bobby is and what talents he is likely to develop, the sentence does not remain completely uninterpretable. What we learn from (14) is precisely that the writer believes in a connection between children's artistic interests and the development of mathematical skills later in their lives. In fact, if we are ourselves of the (popular if unjustified) opinion that people have either artistic or scientific predispositions, but rarely both, we may find ourselves strongly objecting to the conditional. This suggests that the connection is not something that is conveyed only by saying that if φ then ψ. The link seems to be communicated, too, out of any context of utterance, that is, it seems to belong to what is said.[10]

7 Conclusion

The connection between a conditional's antecedent and its consequent, whatever it is, cannot be a conversational implicature. It is neither cancellable, nor reinforceable. Moreover, a conditional does not need to be uttered in any particular conversational context to communicate that there is a connection between its clauses. Needless to say, blaming the unacceptability of false-link conditionals on false conversational implicatures is not the only possible pragmatic take on the problem: the possibility that it is due to a conventional implicature or presupposition failure is still to be explored.[11] Admittedly, our investigations do not

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10 See Krzyżanowska (2018) for a more detailed discussion of the interpretation of conditionals whose context of utterance is unknown.

11 Though see recent work by Skovgaard-Olsen et al. (2019).

offer conclusive evidence that the connection belongs to what we could call semantics of conditionals, at least when understood as the truth-conditional content. Nevertheless, since the most salient alternatives, conventional implicatures and presuppositions, are more closely tied to particular linguistic forms, we have good reasons to believe that the connection is a part of the conventional meaning of conditionals – of what conditionals are literally about.

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