# Sorting out left-nested conditionals[1]

Daniel LASSITER — *University of Edinburgh*

To appear in *Proceedings of Sinn und Bedeutung 2024*.

**Abstract.** Left-nested conditionals — those with another conditional in the antecedent — have largely been ignored in the semantic and philosophical literature. When discussed, they are usually treated as marginal or even ill-formed, even though linguistic theories of conditionals predict that they should be readily interpretable. This paper attempts to explain why they are special, and to draw out consequences for how they can be used to inform semantic theories of conditionals. Using a number of diagnostics, I show that bare left-nested conditionals are preferentially interpeted as *premise conditionals*. Premise conditionals are syntactically and semantically distinct from the hypothetical conditionals that the semantic literature has focused on, and they show severe restrictions in terms of the discourse contexts in which they can occur. Left-nested conditionals show the same behavior on this and a number of other diagnostics, including overt markers in Japanese and German. The paper concludes with a brief discussion of how these puzzling patterns could be explained from various theoretical perspectives, and some methodological lessons.

**Keywords:** premise conditionals, hypothetical conditionals, nested conditionals, epistemic conditionals, trivalent conditionals

## 1. Nested conditionals, right and left

Right-nested indicative conditionals—those with a conditional in their consequent — have played a key role in the semantic and philosophical literature. For instance, many authors have discussed the apparent equivalence of sentences of the form in (1) and the various puzzles that plague a logic for conditionals that would validate their equivalence ("Import-Export": see, e.g., McGee 1985; Fitelson 2015; Khoo and Mandelkern 2019).

(1) a. If $A$, (if $B$, $C$).
    b. If ($A$ and $B$), $C$.

(2) a. If Alf comes soon, then if Barbara agrees to play, we'll have enough for spades.
    b. If Alf comes soon and Barbara agrees to play, we'll have enough for spades.

The ready interpretability of right-nested conditionals is also a puzzle for non-propositional theories of conditionals (Adams, 1965, 1975; Edgington, 1995). These accounts hold that indicative conditionals denote a different type of semantic object from other declarative sentences: essentially, they have probabilities but not truth-values, and so do not pick out a possible-worlds proposition. The puzzle for such theories is to give a compositional semantics for *if* that can handle something non-propositional as its second argument—i.e., *if B, C*, the consequent of (1a).

Theories that treat conditionals as denoting ordinary propositions, such as the well-known Stalnaker 1968 and Kratzer 1991, have no similar difficulty. Indeed, they predict that conditionals should embed freely. The difficulties around right-nested conditionals, discussed especially in philosophical literature, involve issues such as whether particular theories predict the right

[1]Thanks to Wataru Uegaki and Maik Thalmann for the Japanese and German data, and to Paul Pietroski and the SuB 2024 audience for discussion.

truth-conditions, or how one can assign them sensible probabilities without falling afoul of Lewis 1976-style triviality results.

While the prediction of unrestricted embedding is welcome in the case of right-nested conditionals, it is less clear whether propositional theories are on the right track when it comes to left-nested conditionals (LNCs): those with another conditional in their antecedent.

(3) If (*B* if *A*), *C*.

If conditionals denote ordinary propositions, there is no reason that they should not appear in the antecedent of a conditional as well. However, Gibbard (1980) points out in defense of non-propositional theories that LNCs are often difficult to interpret:

> Many embeddings of indicative conditionals, after all, seem not to make sense. Suppose I tell you, of a conference you don't know much about,
>
> (4) If Kripke was there if Strawson was, then Anscomb was there.
>
> Do you know what you have been told? [p.235; example number changed]

(4) does indeed seem like an odd utterance out of the blue, and LNCs in general seem to be a fairly marginal sentence type. This may well explain why they have received so little attention in the empirical and formal literature on conditionals. But if they are so marginal, propositional theories face a challenge—the mirror image of the challenge that RNCs pose to non-propositional theories. Every theory in which *If A, C* denotes a proposition predicts that *If (B if A), C* should have a definite interpretation. Left-nested conditionals ought to feel ordinary, as right-nested conditionals like (2b) do. Why, then, are they frequently weird?

This puzzle is a very general one, affecting propositional theories—including all major theories in the formal semantics literature—regardless of their specific predictions about the interpretation of conditionals. Because of this generality, it will not be necessary to examine the predictions of specific semantic theories in much detail here.[2] The proposal in this paper is similarly general: I will provide a discourse-based account of the oddness of out-of-the-blue LNCs that is in principle compatible with any propositional theory of their semantics. In brief, the claim is that there bare LNCs are generally interpreted as *premise conditionals* (PCs), which have different syntactic, semantic, and pragmatic behavior from the *hypothetical conditionals* (HCs) on which the semantic literature has focused attention. With this distinction in hand, it is easy to explain why (4) is odd out of the blue: premise conditionals are picky about the discourse contexts they can occur in, and (4) does not provide the right kind of context. This account predicts, correctly, that (4) will be much more acceptable in a slightly different context; we'll see shortly that this prediction is correct.

[2] As Gibbard points out, the theory that *if* is the material conditional makes a plainly incorrect prediction about LNCs: sentences with the form in (3) should be equivalent to $(A \wedge \neg B) \vee C$. Popular propositional theories such as Stalnaker 1968; Kratzer 1991 and the strict conditional theory (e.g., Lycan 2001) make specific predictions about the interpretation of LNCs, which have not been scrutinized in detail to my knowledge. Trivalent truth-functional theories inspired by de Finetti 1936 also make definite predictions: for example, de Finetti's original theory predicts that (3) should be equivalent to both (1a) and (1b). The empirical adequacy of this prediction is controversial (Douven, 2016; Lassiter and Baratgin, 2021; Khoo, 2022), but it won't be necessary to resolve this controversy here. In any case, other, perhaps better-motivated trivalent theories make different predictions about LNCs (cf. Égré et al. 2021).

In §2 I'll show that bare LNCs pattern with PCs, and not HCs, in terms of overt marking and Japanese and German, and on six further empirical diagnostics drawn from the syntactic and pragmatic literature on PCs. §3 turns to a crucial exception: LNCs whose embedded conditional contains certain generic, quantificational, or modal operators freely allow a HC interpretation. §4 briefly discusses how theories of conditional semantics might account for the lack of a HC reading of bare LNCs, as well as the exceptions noted in §3. §5 sums up and draws out some methodological consequences.

## 2. Bare left-nested conditionals are premise conditionals

Most semantic work on conditionals has focused on hypothetical conditionals, whose interpretation involve supposing that something is true and drawing out consequences (see a.m.o. Ramsey 1929; Ducrot 1972; Mackie 1973). In general, it is not felicitous to use a conditional if the supposition—i.e., the antecedent—is already known to be true. As a result, indicative conditionals are usually conversationally acceptable only if the truth-value of their antecedent is unknown (Stalnaker, 1975; von Fintel, 1998; Leahy, 2011, 2018).

(5) If Mary left early, the party was a disaster.

Someone who asserts (5) would normally be taken to be unsure whether Mary left early, but confident that—*if* she did—the party did not go well. This makes good sense: after all, if the speaker of (5) were certain that Mary left early, and were also in a position to assert (5), they could have asserted something more informative such as *Mary left early, and the party was a disaster*. Conditionals that behave in this way are hypothetical conditionals (HCs).

While almost all work on conditionals in formal semantics has focused on HCs, another type of conditional—the *premise conditional*—has received some attention in the syntax literature. Other than occasional acknowledgements in earlier work (e.g., Haiman 1978; Comrie 1982), the first extended treatment of PCs was Iatridou 1991, who called them "Factual conditionals" and argued that they are syntactically, semantically, and pragmatically distinct from HCs. Important subsequent work on PCs includes Haegeman 2003; Haegeman and Schönenberger 2023; Castroviejo and Mayol 2024. These authors disagree on whether the PC/HC distinction is fundamentally syntactic, or the syntactic pecularities of PCs derive from their special discourse status. Our arguments here will not depend on which approach is ultimately correct. Instead, we will use diagnostics from these papers along with the uncontroversial observation that PCs have a special and restricted discourse status. What, then, is this discourse status?

### 2.1. Diagnostics 1-2: Discourse anaphora and antecedent uncertainty

In general, a PC interpretation is available for a conditional *If A, C* only when the antecedent *A* echoes, explicitly or implicitly, information that is already available in the discourse. For instance, Iatridou (1991: p.93) gives the example in (6).

(6) a. **Alf**: Bill is unhappy here.
b. **Barbara**: If he is so unhappy, he should leave.

Barbara's response has two notable features. First, the antecedent directly echoes Alf's assertion. Second, it lacks the implication of antecedent uncertainty that is normally associated with HCs. If Barbara's reply *did* have this implication, then it would be felt as fairly aggressive,

casting doubt on Alf's reliability. This is indeed the effect of a variant with focused *if*: "**If** he is so unhappy, ...", with the implication "(and I doubt it)". By contrast, the unmarked interpretation of Barbara's reply in (6) is simply to draw out a consquence of Alf's assertion. Notably, the *if* in Barbara's reply could be replaced with presuppositional *given that* or *since* with little change to its overall effect. This would presumably not be the case if (6b) cast doubt on *Bill is unhappy*.

(7) a. **Alf**: Bill is unhappy here.
b. **Barbara**: Given that/Since he is so unhappy, he should leave.

The naturally-occurring example in (8) makes the same point even more clearly (from a letter to the *Guardian* cited by Haegeman and Schönenberger (2023: p.289)).

(8) We are seeing a fall in the incidence of crime, particularly serious crime, and I think we're right to say, 'What's going on?' If crime is falling, why are we seeing a continuing rise in the prison population.

Clearly, the author of this passage does not wish for their second sentence to cast doubt on the veracity of their first. Under a HC construal, the second sentence would therefore be infelicitous since it occurs in a context which entails the antecedent *crime is falling*. But this is not a HC: it is a PC in which the antecedent is not supposed, but merely used to explicitly state a piece of information from which the question in the consequent naturally follows. Here again, a variant of (8) with *given that* or *since* replacing *if* conveys essentially the same thought.[3]

(9) We are seeing a fall in the incidence of crime ... Given that/Since crime is falling, why are we seeing a continuing rise in the prison population?

Example (8) also illustrates the fact that PCs do not always echo the precise form of a previous utterance. Rather, the requirement is that the antecedent expresses the same content as something in the previous discourse, or (as in this case) content that is readily inferred from previous discourse. In general, then, a PC interpretation is available only when the antecedent can be anaphorically linked to an overt or inferred discourse antecedent.

The absence of an antecedent-uncertainty inference is also crucial in explaining the use of PCs in chains of reasoning. For example, it is natural in mathematical reasoning to state an already-proven conclusion in an *if*-clause, in order to indicate that the next step of reasoning will make crucial use of it.

(10) a. Let $x = 5$, and solve for $z$: (a) $x + y = 8$; (b) $z = x^2 - y$.
b. If $x = 5$, then $y = 3$. If $x = 5$ and $y = 3$, then $z = 22$. So, $z = 22$.

The felicity of (10b) clearly does not require its author to be uncertain about the antecedents of its first and second sentences.

[3]The interchangeability of *if* and *given that* in PCs is reminiscent of Haiman's (1978) claim that "Conditionals are topics". As a general claim, this suggestion seems to have been decisively refuted by von Fintel's (1994) observation that *if A* can be focused in *if A, C*, and can respond to a question of the form *Under what conditions does C hold?*. The appeal of Haiman's claim may be due to the fact that it is frequently correct for premise conditionals. In PCs, the antecedent is always discourse-given and frequently topical, cannot be focused, and cannot respond to a question like *Under what conditions does C hold?* (Haegeman and Schönenberger, 2023: p.288-9).

For our purposes, the crucial observation is that LNCs with a bare conditional in the antecedent behave like PCs on these empirical diagnostics. While Gibbard's example (4) is indeed odd in the out-of-the-blue context that he constructs, its felicity improves dramatically when the antecedent echoes a previous assertion of a conditional.

(11) a. **Alf**: Kripke was there if Strawson was.
b. **Barbara**: If Kripke was there if Strawson was, then Anscomb was there too.

This suggests that the oddity of Gibbard's (4)/(11b) is not really due to this sentence being a LNC. Rather, the oddity is primarily due to its being a premise conditional occurring in an inappropriate discourse environment—one that does not provide the right kind of antecedent for the premise. If we modify the context to provide such an antecedent, it is much more acceptable, and readily interpretable: Barbara's reply is read as drawing out a consequence from the conditional that Alf asserted. Furthermore, Barbara's reply does not indicate any doubt about the correctness of Alf's original assertion—another hallmark of PCs, and a crucial difference from HCs.

Admittedly, Barbara's reply in (11) retains a hint of oddity. This can be attributed to the fact that a PC indicates that the consequent follows from the antecedent. The context in (11), however, does not provide enough information to allow the reader to reconstruct how Barbara could plausibly infer the location of one philosopher from some conditional information about two others. We can remove this confound with a similar example in which it is clear how the consequent can be inferred from the antecedent. For instance, suppose that neither Alf not Barbara were present at a party, and they are talking about people who may have been:

(12) a. **Alf**: Mary came to the party if John did.
b. **Barbara**: Aha. If Mary came if John did, they are friends.

(13) makes a similar point. Here, the LNC in (13b) does not express doubt about whether Carl has accurately reported his plans in (13a). It merely draws out an inference that Dana has made from the conditional plan that he has expressed, and one which she presumably fully believes.

(13) a. **Carl**: We'll cancel the camping trip if it rains.
b. **Dana**: If you'll cancel the camping trip if it rains, you're not from Scotland.

And, here again, replacing *if* with presuppositional *given that/since* conveys approximately the same thought.

(14) **Dana**: Given that/Since you'll cancel the camping trip if it rains, you're not from Scotland.

Diagnostics 1 and 2 provide evidence that, at least in some contexts, LNCs have a PC interpretation and cannot be interpreted as HCs. This explains why they are odd out of the blue; why their felicity improves when a discourse antecedent is provided; and why they lack the implication of antecedent uncertainty associated with HCs. And it sharpens the puzzle that we posed for semantic theories of conditionals in §1: if the semantics delivers ordinary truth-conditions for LNCs as hypothetical conditionals, why would this interpretation not be available in the examples we have seen, alongside a PC interpretation?

Note that the claims in this section are restricted to "bare" LNCs — those whose embed-

ded conditional does not contain a modal or quantificational adverb, and does not have a generic/habitual interpretation. LNCs with these features are readily interpreted as HCs, as we will see later on (§4).

### 2.2. Diagnostics 3-4: Japanese and German conditionals

Japanese and German make an overt distinction between PCs and HCs: both languages have a general conditional marker, alongside a marker that is possible in HCs and impossible in PCs. In both cases, informants report that bare LNCs can only be formed with the general marker, and are impossible with the marker that is specialized for HCs. This suggests that bare LNCs are PCs in these languages as well.

In Japanese, conditionals can be marked with the complementizers *ra* and *nara*. HCs can be formed with either marker. However, a PCs interpretation is only possible with *nara*, which also functions as a topic marker (Akatsuka, 1986: p.348). For instance, a HC-favoring context like (15) allows either marker.[4]

(15) [Context: We have no idea whether Mary came to the party.]
  a. mosi meari-ga kita-{ra/nara}, kanojo-to jon-wa tomodati-da.
  if Mary-Nom came-RA/NARA she-Comitative John-Top friend-Cop
  b. "If Mary came, she and John are friends"

However, in a context in which the antecedent is discourse-anaphoric and presumed true, only *nara* is possible.

(16) [Context: Alf has just said "Mary came to the party." Barbara replies:]
  a. mosi meari-ga kita-nara, kanojo-to jon-wa tomodati-da.
  if Mary-Nom came-NARA she-Comitative John-Top friend-Cop
  b. "If Mary came, she and John are friends"

(17) [Context: Alf has just said "Mary came to the party." Barbara replies:]
  a. # mosi meari-ga kita-ra, kanojo-to jon-wa tomodati-da.
  if Mary-Nom came-RA she-Comitative John-Top friend-Cop
  b. Intended: "If Mary came, she and John are friends"

The crucial datum is that the LNC in (18) can only have the PC-compatible *nara* as the main complementizer. The variant with *ra* in (19a) is unacceptable.

(18) a. Moshi meari-ga kita-{nara/ra} jon-ga kita-nara karera-wa
  If M-NOM came-{NARA/RA} J-NOM came-NARA they-TOP
  tomodati-da
  friends-COP
  b. 'If Mary came if John did, they are friends'

(19) a. # Moshi meari-ga kita-{nara/ra} jon-ga kita-ra karera-wa tomodati-da
  If M-NOM came-{NARA/RA} J-NOM came-RA they-TOP friends-COP
  b. Intended: 'If Mary came if John did, they are friends'

[4] thanks for Wataru Uegaki (p.c.) for the Japanese data.

This suggests that the LNC in (18) can only be interpreted as a PC. Notice that both *ra* and *nara* are possible in the conditional embedded in the antecedent; this is because the echoed conditional can be a HC with *ra*. However, the main conditional marker of the LNC can only be *nara*—the same restriction that we see in PCs.

German shows a similar pattern with the conditional markers *wenn* and *falls*. *Wenn* is acceptable in both PCs and HCs. In contrast, *falls*-marked conditionals are not acceptable in contexts that require a PC interpretation—those where the antecedent is discourse-given and not in doubt.[5] Assuming we know nothing about what the weather will be like:

(20) a. Wenn/Falls es regnet, ist das Spiel abgesagt.
WENN/FALLS it rains, is the game canceled.
b. 'If it's raining, the game is canceled.'

If the truth of *It's raining* is already established, then *wenn* is acceptable but *falls* is unacceptable.

(21) [Context: Alf has just asserted "It's raining."]
a. **Barbara**: Wenn es regnet, ist das Spiel abgesagt.
**Barbara**: WENN it rains, is the game canceled.
b. 'If it's raining, the game is canceled.'

(22) [Context: Alf has just asserted "It's raining."]
a. **Barbara**: # Falls es regnet, ist das Spiel abgesagt.
**Barbara**: FALLS it rains, is the game canceled.
b. Intended: 'If it's raining, the game is canceled.'

Given this, the theory proposed here predicts that *wenn* should be acceptable as the main complementizer of a LNC, while *falls* should be unacceptable in the same position. Both should be acceptable in the embedded conditional. These predictions are borne out:

(23) a. Wenn ihr das Spiel absagt, wenn/falls es regnet, seid ihr keine echten
WENN you the game cancel WENN/FALLS it rains are you no true
Göttinger.
Göttinger
b. 'If you cancel the picnic if it rains, you aren't real Göttingers.'

(24) a. # FALLS ihr das Spiel absagt, wenn/falls es regnet, seid ihr keine echten
FALLS you the game cancel WENN/FALLS it rains are you no true
Göttinger.
Göttinger
b. Intended: 'If you cancel the picnic if it rains, you aren't real Göttingers.'

In sum, German and Japanese make an overt distinction between PCs and HCs in terms of the embedding complementizer. Both languages have a general conditional marker, and a marker that is restricted to HCs. In both languages, LNCs pattern with PCs: they are acceptable when

[5] I'm grateful to Maik Thalmann (p.c.) for bringing the relevance of German to my attention and providing the data. Recently Kaufmann et al. (2024) have independently observed that *falls* is not possible in PCs. They suggest that this restriction can be explained if *falls* presupposes that the speaker is in a state of inquisitiveness regarding the antecedent.

formed with the general marker, but unacceptable with the HC-only marker. This provides further evidence that left-nested conditionals are premise conditionals, and are not naturally interpreted as hypothetical conditionals.

### 2.3. Diagnostics 5-6: Negative and positive polarity items

The next set of diagnostics involves the fact that HCs allow negative polarity items (NPIs), but not positive polarity items (PPIs), in their antecedents. Polarity items have the opposite distribution in PCs: they allow PPIs, but not NPIs, in the antecedent. LNCs pattern with PCs again here.

One of our first examples of a PC, taken from Iatridou (1991), was (6), repeated here as (25). This example uses anaphoric *so* to force a PC reading.

(25) a. **Alf**: Bill is very unhappy here.
b. **Barbara**: If he is so unhappy, he should leave.

By contrast, *so* is distinctly unnatural in examples like (6b) in a context where only a HC interpretation is available.

(26) a. **Alf**: I have no idea how Bill is doing — is he enjoying the party?
b. **Barbara**: I don't know. # But if he is so unhappy, he should leave.

The reason that *so* forces a PC construal is that it is a PPI. HCs readily allow NPIs but do not license PPIs. Conversely, as Iatridou (1991: p.88-9) notes, PCs allow PPIs, and do not license NPIs in their antecedents. Some of Iatridou's original examples are in (27).

(27) a. # If he (indeed) lifted a finger to help you should pay him.
b. # If you're so mad at anybody you should show it.
c. # If he will lift a finger to help you should pay him.

Note that these examples are not meant to be unacceptable in *every* context. The intended interpretation is that they are unacceptable as PCs, i.e., in a discourse context in which the addressee has just asserted the content of the antecedent, and the speaker is not trying to cast doubt on its truth. The unavailability of NPIs in PCs is not unexpected, given their other similarities to presuppositional operators like *since* and *given that*. These operators also fail to license NPIs:

(28) a. # Since he lifted a finger to help you should pay him.
b. # Given that you're so mad at anybody you should show it.

For PCs and *since/given that* alike, this distribution could be explained, for example, by sensitivity of polarity items to (non-)veridicality (Giannakidou, 1998).

LNCs are similar to PCs in a specific way: they license PPIs, but not NPIs, in the *consequent* of the embedded conditional. For instance, (29) is most naturally read as an echoic PC, and (30) is quite odd.

(29) If Mary was rather pleased if Bill was involved, her expectations are too low.

(30) # If Mary lifted a finger if Bill was involved, the job got done.

The oddity of (30) makes sense given that that it attempts to echo something with the form of (31), which is unacceptable on its own:

(31) # Mary lifted a finger if Bill was involved.

NPIs are, however, acceptable in the *antecedent* of the embedded conditional. This too is unsurprising, since the antecedent of a LNC can echo a HC with an NPI in its own antecedent.

(32) a. Mary was pleased if Bill lifted a finger to help.
b. If Mary was pleased if Bill lifted a finger to help, her expectations are too low.

In sum, the distribution of NPIs and PPIs in LNCs is what we we would expect if LNCs are quite generally restricted to a PC interpretation.

### 2.4. Diagnostic 7: Coordinations of antecedents

Haegeman and Schönenberger (2023: p.284ff.) show that conditionals with coordinated antecedents cannot mix antecedent types. Either both antecedents must receive a PC interpretation, or both must be hypothetical. Supposing Ed and Fran have no idea whether Mary's job is at risk, the following is infelicitous:

(33) a. **Ed**: Bill is very unhappy here.
b. **Fran**: # If Bill is so unhappy, and if Mary loses her job, they'll be in trouble.

Combining this restriction with the fact that LNCs are naturally read as PCs, we predict that a LNC with conjoined antecedents *If (B if A) and if C, then D* should be acceptable only when *if C* can receive a PC interpretation in context. This seems to be correct. For instance, the conjoined-antecedent LNC in (34c) is readily acceptable in an echoic context. For instance, suppose that Mary is great fun at parties, but she and John always fight when they are together. So the best kind of party is one where she comes alone, but this time the host wasn't so lucky:

(34) a. **Alf**: John came to the party if Mary did.
b. **Barbara**: The food wasn't very good.
c. **Carl**: If John came if Mary did, and if the food was bad, it was a lousy party.

This example is rather less acceptable in a context that favors a HC interpretation of the simple antecedent—one that does not provide the information that the food was bad, or even explicitly generates doubt about its truth.

(35) a. **Alf**: John came to the party if Mary did.
b. **Barbara**: I have no idea about the food—sometimes it's great, sometimes it's terrible.
c. **Carl**: ?? If John came if Mary did, and if the food was bad, it was a lousy party.

The oddness of (35c) in the modified context provides support for the prediction generated by Haegeman and Schönenberger (2023) together with the current theory: a LNC can be coordinated with a simple conditional antecedent only if the latter receives a PC interpretation.

2.5. Diagnostic 8: *Only* and inversion

Hypothetical conditionals show subject-aux inversion triggered by an initial *only* binding into the antecedent (Haegeman and Schönenberger, 2023: p.288).

(36) Only if you have the courage to follow your heart will you succeed on the path of love.

Haegeman and Schönenberger argue that this is not possible in PCs. For example, their example (37a) can only be read as a PC in context. A HC construal is impossible because the context conflicts with the antecedent uncertainty implication of HCs. With *only* and subject-aux inversion, though, the sentence is simply infelicitous: a PC interpretation is no longer possible, and the HC interpretation is nonsensical.

(37) a. The chocolate manufacturers looked with pleasure at the statistics. If the chocolate manufacturers are pleased, they are not satisfied.
b. Only if the chocolate manufacturers are pleased are they not satisfied.

This argument provides a subtle syntactic diagnostic for HC/PC status in English. Following it, we expect that LNCs should be unacceptable with initial *only* and inversion of the main subject and aux. This prediction seems to be correct:

(38) a. If Mary was distressed if Bill left, Sue will be annoyed.
b. # Only if Mary was distressed if Bill left will Sue be annoyed.

(39) a. If the game is canceled if it rains, the organizers are too nervous.
b. # Only if the game is canceled if it rains are the organizers too nervous.

## 3. A key exception: LNCs with certain operators can be HCs

The observation that LNCs are generally (always?) interpreted as PCs is subject to a systematic exception: a HC construal is possible when the embedded conditional contains certain adverbs of quantification (40), modals (41), or when it has a generic/habitual construal (42).

(40) [I don't know how things work in my new workplace, but I hope people are kinder than in my previous one.] If the boss rarely yells at employees if they make a mistake, I'm going to be happier working here.

(41) [I don't know what the rules of this test are, but it seems like something's not right here.] If Bill is obliged to stop writing if the timer has gone off, he's breaking the rules by continuing.

(42) If a female bear attacks if a human approaches, she has cubs.

These LNCs behave like HCs, rather than PCs, on the diagnostics discussed in §2. Most obviously, the antecedents of (40)-(42) do not need to be discourse-given, and these LNCs can be used in the contexts where there is explicit uncertainty about the truth of the antecedent.

Outside of Gibbard's infelicitous (4), most examples of LNC discussed in the semantic/philosophical literature fall into this exceptional category. This makes sense, given that these are the LNCs that are most felicitous in out-of-the-blue contexts, and that do not require accommodating any elaborate discourse context. For example, the conditional in the antecedent of (43a) (from Kaufmann 2009: p.18) describes a disposition of the switch in question to fail in a certain

class of situations; *will* is a modal here. (43b) (from Douven 2016) has a generic interpretation, describing a tendency of the material in question to respond in a certain restricted class of situations (cf. Lassiter and Baratgin 2021).

(43) a. If this switch will fail if it is submerged in water, it will be discarded.
b. If this material becomes soft if it gets hot, it is not suited for our purposes.

It's not immediately obvious why conditionals with a modal, quantificational, or generic interpretation should be exceptions to the general LNC/PC correlation established in §2. However, certain theories of conditionals may have the resources to give some insight here. In the next section we will discuss the prospects.

## 4. Why? Some options

Many conditionals can be interpreted either as HCs or as PCs, depending on context. Why would LNCs lack the HC interpretation? And why are embedded conditionals with certain types of modal or quantificational operators exceptional in this respect?

The main purpose of this paper has been to establish the empirical pattern: a full explanation of exactly why it holds would require more space, and more knowledge, that I currently have available. However, I can sketch briefly a few directions that such an explanation, depending on details of the semantic theory of HCs.

Many theories of conditionals hold that bare conditionals have an epistemic intepretation, whether provided by *if* itself or by a silent epistemic operator. For an advocate of these theories, a promising direction would be to reduce the restriction to the general unavailability of speaker-oriented epistemics in a conditional antecedent (Bellert, 1977; Nilsen, 2004). Example (44) illustrates:

(44) ?? If Stanley possibly ate his Wheaties, it was a good morning.

Examples like (44) are not really *unacceptable*, as sometimes claimed. What is special about them is that they lack a HC interpretation, and so require the special discourse context associated with a PC interpretation. If that context is provided—viz., someone has just said "Stanley possibly ate his Wheaties"—they are fine.

This line of attack predicts that LNCs whose antecedent contains a speaker-oriented epistemic should be an exception to the exception: that is, speaker-oriented epistemics should *not* rescue the HC interpretation of a LNC. This seems to be correct.

(45) ?? If Stanley possibly ate his Wheaties if his brother did, it was a good morning.

Admittedly, this style of explanation involves reduction to an unsolved problem: we don't, to my knowledge, have a totally satisfying explanation of why conditionals dislike speaker-oriented epistemics in their antecedents. Nilsen (2004) claims that the restriction holds because speaker-oriented epistemics are PPIs. This may be correct, but it raises the further question of why these modals would be PPIs while others are not. In any case, if an epistemic conditional is semantically analogous to a speaker-oriented epistemic operator in whatever way is responsible for the restriction illustrated by (44), then we have the beginnings of an explanation of the main patterns discussed in this paper.

Rather than appealing to a stipulation that certain epistemic operators are PPIs, an alternate line of attack might be to suppose that there is something pragmatically strange about a speaker making a supposition about her own epistemic state. Combined with an epistemic theory of conditionals and spelled out in convincing detail, such a theory would have the advantage of giving a unified explanation of the unavailability of a HC reading of three sets of facts: the lack of a HC reading of bare LNCs, the lack of a HC reading of conditionals with speaker-oriented epistemics in the antecedent, and the fact that LNCs with non-epistemic conditionals in the antecedent can be HCs (§3).

A recently popular alternative to an epistemic theory of conditionals is the trivalent, truth-functional approach pioneered by de Finetti (1936). This theory and variants have been quite successful in explaining various puzzles around the logical and probabilistic behavior of conditionals (e.g., Cantwell 2006; Huitink 2008; Rothschild 2014; Lassiter 2020; Égré et al. 2021; Égré et al. 2025; Santorio and Wellwood 2023). Crucially, conditional sentences do not have a modal interpretation in trivalent theories. It is rather less obvious how to explain the unavailability of a HC reading of LNCs from this perspective. In de Finetti's original theory, a conditional with a true antecedent and consequent is true; one with a true antecedent and false consequent is false; and the conditional is otherwise undefined. On this semantics, a bare LNC *If (B if A), C* should have a straighforward HC interpretation equivalent to both *If (A and B), C* and *If A, (if B, C)*. This is because the conditional receives a truth-value only if the antecedent is true; and in each case, this holds only if both *A* and *B* are true. These predicted equivalences are actually plausible in many cases, once we ensure that we are not dealing with conditionals with an extra layer of generic/habitual interpretation (Lassiter and Baratgin, 2021). But this only makes it more difficult to explain the lack of a HC reading of LNCs.

One option for a trivalent theorist would be to argue that the HC reading of a LNC is unavailable for pragmatic reasons. For instance, the problem might be that a hypothetical LNC can always be phrased in a semantically equivalent and more perspicuous way—namely, *If (A and B), C*. Such an account could appeal further to the fact that this equivalence holds only in bare conditionals, and is broken when there are modals, adverbs of quantification, or generic/habitual operators in the antedentent conditionals. For instance, consider example (40): *If (rarely B if A), C* is not semantically equivalent to *If (A and rarely B), C* or any straightforward variant. However, much more work would be needed to make good on this suggestion. To pick just one problem, it is not obvious on the trivalent semantics why a LNC should be "less perspicuous" than the conjunctive equivalent, or why being less perspicuous would lead to strong unavailability of the HC reading rather than a weak preference for the other phrasing.

Choosing between these two options, then, the epistemic theory appears to be at an advantage. But the trivalent semantics may still be in the game. One of the leading motivations for the trivalent approach is to give a precise treatment of the intuition that the evaluation of a conditional involves making a *supposition*. Indeed, in the psychological literature on conditionals the trivalent approach is usually referred to as "the suppositional theory" (e.g., Evans and Over, 2004; Over and Evans, 2024). One possibility is that the trivalent theory is essentially correct as a logic, but it is semantically derivative from more basic discourse-based considerations. (Lassiter (2025) proposes a theory along these lines, building on Kaufmann 2000.) Suppositional theories may have the resources to explain the oddness of LNCs on a HC construal. The intuition is that there is something incoherent about the HC construal of *If (B if A), C*: it amounts to

a supposition that a certain supposition is in play, and it is not clear what this would even mean. If a discourse-based theory can deliver this result while also accounting for the rescuing effects noted in §3, this would be a substantial argument in its favor. But this challenge remains for future work.

## 5. Summary and consequences

Left-nested conditionals frequently sound odd, but this isn't a reason to embrace non-propositional theories of conditionals. Standard semantic theories of conditionals do, however, owe us an explanation of *why* they are sometimes odd, and of the contexts in which various types of LNCs are acceptable after all. This paper takes steps toward this goal, showing that bare LNCs are usually read as *premise conditionals*, an understudied type of conditional that is syntactically, semantically, and pragmatically distinct from the hypothetical conditionals targeted by nearly all work in formal semantics. On eight diagnostics from three languages, §2 shows that LNCs pattern with PCs against HCs. Among other things, this explains why they frequently sound odd out of the blue: a PC interpretation requires a special discourse context, and PCs are often felt as odd without the right context. However, §3 motivates a systematic exception to this generalization. LNCs whose antecedent contains certain modals, adverbs of quantification, or generic/habitual operators freely allow a HC construal.

The main challenge to semantic theories of conditionals is to explain these patterns. While §4 takes a brief stab, there is clearly much more to be done before we can confidently use the empirical patterns in this paper to adjudicate among theories.

This discussion also brings out a broader issue about LNCs: it is difficult to use them to motivate semantic claims about theories of hypothetical conditionals, because in most cases our intuitions about LNCs are generated by a premise-conditional interpretation. The latter is semantically different from a hypothetical conditional, and so intuitions are untrustworthy if we are trying to theorize about HCs. When LNCs can be read as HCs, it is because there is another operator in the mix—a modal, a quantificational adverb, or generic operator whose lack of overt realization can mislead us (Lassiter and Baratgin, 2021). In addition, it has been noted that intuitions about the probabilities of LNCs are often unclear. This is unsurprising, given that they are usually PCs, and as a result their assertion is contextually equivalent to an assertion of their consequent. In any case, the data in this paper problematize efforts to use data around LNCs to argue for or against theories of the semantics and probabilities of HCs, including Gibbard 1980; Kaufmann 2009; Lassiter and Baratgin 2021; Khoo 2022 among others.

Zooming out even further, it is surprising that formal theories of the semantics and pragmatics of conditionals have almost completely ignored the existence of premise conditionals, despite their being featured prominently in influential work such as Iatridou 1991. This neglect introduces a major empirical confound into our understanding of the behavior of conditionals. Careful attention to the numerous differences between hypothetical and premise conditionals will be crucial in future work if we wish to have a complete understanding of the linguistic behavior of this complex and fascinating sentence type.

## References

Adams, E. (1965). The logic of conditionals. *Inquiry 8*(1-4), 166–197.
Adams, E. W. (1975). *The Logic of Conditionals: An Application of Probability to Deductive*

*Logic*. Springer.

Akatsuka, N. (1986). Conditionals are discourse-bound. In E. C. Traugott, A. T. Meulen, J. S. Reilly, and C. A. Ferguson (Eds.), *On conditionals*, pp. 333–352. Cambridge University Press.

Bellert, I. (1977). On semantic and distributional properties of sentential adverbs. *Linguistic Inquiry 8*(2), 337–351.

Cantwell, J. (2006). The laws of non-bivalent probability. *Logic and Logical Philosophy 15*(2), 163–171.

Castroviejo, E. and L. Mayol (2024). Premise conditionals are echoic thematic conditionals. *Journal of Pragmatics 225*, 34–47.

Comrie, B. (1982). Future time reference in the conditional protasis. *Australian Journal of Linguistics 2*(2), 143–152.

de Finetti, B. (1936). La logique de la probabilité. In *Actes du congrès international de philosophie scientifique*, Volume 4, pp. 1–9. Hermann Editeurs Paris.

Douven, I. (2016). On de Finetti on iterated conditionals. In *Computational models of rationality: Essays Dedicated to Gabriele Kern-Isberner on the occasion of her 60th birthday*, pp. 265–279. College Publications.

Ducrot, O. (1972). *Dire et ne pas dire*. Hermann.

Edgington, D. (1995). On conditionals. *Mind 104*(414), 235–329.

Égré, P., L. Rossi, and J. Sprenger (2021). De Finettian logics of indicative conditionals part I: Trivalent semantics and validity. *Journal of Philosophical Logic 50*(2), 187–213.

Égré, P., L. Rossi, and J. Sprenger (2025). Trivalent conditionals, Kratzer style. Manuscript, École Normale Superieure and University of Turin.

Evans, J. S. B. T. and D. E. Over (2004). *If*. Oxford University Press.

Fitelson, B. (2015). The strongest possible lewisian triviality result. *Thought: A Journal of Philosophy 4*(2), 69–74.

Giannakidou, A. (1998). *Polarity sensitivity as (non)veridical dependency*, Volume 23. John Benjamins Publishing.

Gibbard, A. (1980). Two recent theories of conditionals. In W. Harper, R. Stalnaker, and G. Pearce (Eds.), *Ifs:*, pp. 211–247. D. Reidel Publishing Company.

Haegeman, L. (2003). Conditional clauses: External and internal syntax. *Mind & Language 18*(4), 317–339.

Haegeman, L. and M. Schönenberger (2023). The external syntax of conditional clauses. In S. Kaufmann, D. Over, and G. Sharma (Eds.), *Conditionals: Logic, Linguistics and Psychology*, pp. 275–319. Springer.

Haiman, J. (1978). Conditionals are topics. *Language 54*(3), 564–589.

Huitink, J. (2008). *Modals, Conditionals and Compositionality*. Ph. D. thesis, Radboud University Nijmegen.

Iatridou, S. (1991). *Topics in conditionals*. Ph. D. thesis, Massachusetts Institute of Technology.

Kaufmann, S. (2000). Dynamic context management. In M. Faller, S. Kaufmann, , and M. Pauly (Eds.), *Formalizing the dynamics of information*, pp. 171–188. CSLI Stanford, CA.

Kaufmann, S. (2009). Conditionals right and left: Probabilities for the whole family. *Journal of Philosophical Logic 38*(1), 1–53.

Kaufmann, S., M. Kaufmann, and S. Hinterwimmer (2024). In case *falls* is relevant. In *60th*

*Annual Meeting of the Chicago Linguistics Society*, pp. 26–28.
Khoo, J. (2022). *The Meaning of If*. Oxford University Press.
Khoo, J. and M. Mandelkern (2019). Triviality results and the relationship between logical and natural languages. *Mind 128*(510), 485–526.
Kratzer, A. (1991). Modality. In A. von Stechow and D. Wunderlich (Eds.), *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, pp. 639–650. Walter de Gruyter.
Lassiter, D. (2020). What we can learn from how trivalent conditionals avoid triviality. *Inquiry 63*(9-10), 1087–1114.
Lassiter, D. (2025). The temporary-context theory of conditionals. Manuscript, University of Edinburgh.
Lassiter, D. and J. Baratgin (2021). Nested conditionals and genericity in the de Finetti semantics. *Thought: A Journal of Philosophy 10*(1), 42–52.
Leahy, B. (2011). Presuppositions and antipresuppositions in conditionals. In *Proceedings of Semantics and Linguistic Theory (SALT) 21*, pp. 257–274.
Leahy, B. (2018). Counterfactual antecedent falsity and the epistemic sensitivity of counterfactuals. *Philosophical Studies 175*(1), 45–69.
Lewis, D. (1976). Probabilities of conditionals and conditional probabilities. *Philosophical Review 85*(3), 297–315.
Lycan, W. G. (2001). *Real conditionals*. Clarendon Press.
Mackie, J. L. (1973). *Truth, probability and paradox: studies in philosophical logic*. OUP Oxford.
McGee, V. (1985). A counterexample to modus ponens. *The Journal of Philosophy 82*(9), 462–471.
Nilsen, Ø. (2004). Domains for adverbs. *Lingua 114*(6), 809–847.
Over, D. E. and J. S. B. Evans (2024). Human reasoning. *Elements in Philosophy of Mind*.
Ramsey, F. P. (1929). General propositions and causality. In *The Foundations of Mathematics and other Logical Essays*, pp. 237–255. Kegan Paul.
Rothschild, D. (2014). Capturing the relationship between conditionals and conditional probability with a trivalent semantics. *Journal of Applied Non-Classical Logics 24*(1-2), 144–152.
Santorio, P. and A. Wellwood (2023). Nonboolean conditionals. *Experiments in Linguistic Meaning 2*, 252–264.
Stalnaker, R. (1968). A theory of conditionals. In N. Rescher (Ed.), *Studies in Logical Theory*, pp. 98–112. Blackwell.
Stalnaker, R. (1975). Indicative conditionals. *Philosophia 5*(3), 269–286.
von Fintel, K. (1994). *Restrictions on quantifier domains*. Ph. D. thesis, University of Massachusetts at Amherst.
von Fintel, K. (1998). The presupposition of subjunctive conditionals. In U. Sauerland and O. Percus (Eds.), *The interpretive tract*, pp. 29–44. MIT Working Papers in Linguistics #25.