Antecedent uncertainty and conditional 'iffiness': evidence from Bangla *jodi*-conditionals

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Abstract

This paper revisits the debate between 'operator' and 'restrictor-only' analyses of conditionals, asking whether conditional connectives in natural language contribute a distinctive 'conditional' meaning or merely signal a restriction on the domain of independently introduced quantifiers. In particular, I reexamine arguments for the former view based on the observation that *if* appears to contribute an invariant meaning of antecedent uncertainty across constructions where it is arguably restricting different kinds of quantifiers (Von Fintel and Iatridou, 2002). The paper has two main aims. First, I provide a detailed empirical characterization of the Bangla conditional *jodi* in its indicative use, showing that it imposes a uniform restriction on its antecedent regardless of the quantificational domain of the consequent: the antecedent proposition must be presumed 'undecided' by the speaker at evaluation time in the sense of Kaufmann (2005). This requirement captures a range of otherwise disparate distributional patterns and constitutes a precise notion of uncertainty that is more stringent than that contributed by *if*. Second, I argue that these findings bear on the broader theoretical debate: an operator-based analysis derives the differences between *if* and *jodi* while maintaining a unified semantics across conditional constructions, with variation reduced to a parameter governing antecedent uncertainty. This also extends naturally to other recent findings of antecedent restrictions across connectives (e.g. Kaufmann et al. (2024); Arita (2009)). In contrast, a restrictor-only approach must posit substantial differences between conditionals to capture the same patterns. I conclude that antecedent uncertainty is a locus of cross-linguistic variation among conditionals and outline a formal implementation of this parameter for *jodi* within a framework building on Gillies (2010) and Kaufmann (2005).

Keywords: indicative conditional, tense-aspect, historical modality, Bangla

1 Introduction

1.1 What conditionals mean

In the philosophical literature, conditionals have usually been modeled as two-place connectives relating sentences or propositions.[1][2] For example, *If Ali was sick, he left* might

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[1]Glosses: 1 = first person, 3 = third person, ACC = accusative, CLF = classifier, COP = copula, DAT = dative, FUT = future, GEN = genitive, IMP = imperative, INF = infinitive, IPFV = imperfective, LOC = locative, NEG = negative, PRF = perfect, PROG = progressive, PRS = present, PST = past.

[2]All Bangla judgments are based on intuitions of the author, who is a first-language speaker, and cross-checked with three other first-language speakers. Some of the patterns have been noted in existing research, and this is indicated at the relevant points in the text.

be translated as *sick*→*left*, with → encoding the contribution of the word *if*. In contrast, following Kratzer (1986) (who builds on Lewis and Keenan (1975)), the dominant view in linguistics has been to treat natural language conditional connectives as markers of restriction: the antecedent narrows the domain of evaluation for a modal (or non-modal) quantifier whose prejacent is the consequent. On this view, *If Ali was sick, he left* might correspond to $\Box_{epis \cap sick} left$, where an independently introduced covert necessity modal $\Box_{epis}$ quantifies over relevant epistemic possibilities restricted to worlds in which Ali was sick, and *if* merely signals this restriction. The connective itself contributes no additional meaning. Following Gillies (2010), I call these the 'operator view' and the 'restrictor view' respectively.

Both approaches admit multiple interpretations, the details of which affect what they can predict. Abstracting away from implementation details, the operator view assumes that there is some core invariant 'conditional' meaning contributed by an operator whose morphological exponent is the natural language conditional connective. Thus, the various natural language constructions where this connective appears have some meaning in common. On the other hand, the restrictor approach in its strongest form (i.e. that marking a restriction is *all* the conditional connective does) does not predict this, since the meanings of different constructions where the connective appears depend solely on the (overt or covert) quantifiers that are being restricted. As noted by Gillies (2010), there is no conflict per se between expressing an operator and restricting the domain of quantifiers, and therefore assuming that the connective is a restrictor does not automatically entail the strong version of the claim I sketched above. I use the term 'restrictor-only approach' for this claim, which appears to be the view intended in Kratzer (1986)'s well-known assertion that "The history of the conditional is the story of a syntactic mistake. There is no two-place *if* . . . *then* connective in the logical forms of natural languages. *If*-clauses are devices for restricting the domains of various operators."

While the advantage of one approach over the other is not decisively established (see Gillies (2010), Kaufmann (2005) for discussion), one relevant data-point in the debate is the observation that conditionals appear to convey a meaning of uncertainty about the antecedent, regardless of the quantificational domain of the consequent, which is not paralleled by syntactically similar non-conditional structures. Authors such as Von Fintel and Iatridou (2002) have forwarded this as evidence in favor of an operator approach. The dialectic of the argument is that with a pure-restrictor view where the connective does not contribute any meaning, it is not obvious where to locate the source of such uncertainty, but within an operator view, a simple approach is to treat uncertainty as one element of the 'conditional' meaning contributed by the conditional operator.

This is the facet of the argument that I am concerned with in this paper. I present data from the conditional connective *jodi* in Bangla (Bengali; Eastern Indo-Aryan), which shows various restrictions on the antecedent clauses that can appear under it, regardless of the consequent. An illustrative example is shown in (1), with the complete pattern described in section 2.

(1) a. jodi o aj oshudh kha-ϕ-e, agami kal khabe na
if she today medicine eat-PRS-3, tomorrow eat.FUT.3 NEG
If she takes the medicine today, she will not take it tomorrow.

b. ?? jodi o goto kal oshudh khe-l-o, agami kal khabe na
?? if she yesterday medicine eat-PST-3, tomorrow eat.FUT.3 NEG
Intended: If she took the medicine yesterday, she will not take it tomorrow.

The first aim of this paper is to characterize the restriction on *jodi* antecedents. I propose that the best generalization for the patterns is in terms of a specific modal property: *jodi* requires the antecedent to be 'presumed undecided' at evaluation time, in the sense of Kaufmann (2005). This translates to a restriction on its status in the speaker's epistemic modal base. While a precise implementation has to wait until section 2.2, the intuition is as follows: our beliefs are governed by an assumed asymmetry between a fixed past and an open future (Kamp, 1979; Thomason, 1970), such that (i) if we believe a proposition, we also believe that the question of its truth or falsity is 'decided', that is, fixed in some objective sense; and (ii) if a proposition is about the past, then too, we believe that the question of its truth or falsity is decided, even if we might not know which way (that is, whether it is true or false). Believing that the truth or falsity of a proposition is decided constitutes a specific attitude towards the proposition that lies between ignorance and belief, termed 'presumption of decidedness' by Kaufmann (2005). Informally, this is an attitude we bear towards things that we either know, or are in the past. The converse is the belief that the truth or falsity of a proposition is *not* decided, and this attitude is reserved for propositions that are both unknown and in the future. I propose that *jodi* only admits antecedent clauses that are presumed undecided by the speaker at the evaluation time. This unifies various restrictions on the antecedent clause that otherwise appear disparate.

The second aim is to examine how the restriction on *jodi*-antecedents bears on the long-standing restrictor-vs-operator debate. I revisit an argument for the operator view based on the observation that *if* contributes an invariant meaning of uncertainty about the antecedent (Von Fintel and Iatridou, 2002), and propose that the constraints on *jodi* also demonstrate an invariant meaning contribution of uncertainty about the antecedent. However, the notion of uncertainty involved in *jodi* is more stringent than that reported for *if*. Specifically: whereas *if* requires the speaker to be ignorant about the truth of the antecedent, *jodi* requires the speaker to believe that the truth or falsity of the antecedent is yet undecided. Believing that a proposition is undecided entails ignorance about its truth, but not vice-versa, making the former a stronger requirement. This adds empirical support to the proposal that conditional connectives contribute an invariant meaning that comprises (at least) of uncertainty about the antecedent proposition. Moreover, an operator-based approach can derive the differences between *if* and *jodi* while maintaining a unified semantics for conditional constructions, with variation reduced to a parameter governing the precise notion of antecedent uncertainty. This extends naturally to recent findings of antecedent restrictions across conditional connectives (e.g. Kaufmann et al. (2024); Arita (2009)). In contrast, a strict restrictor-only approach must posit substantial differences between the constructions to capture the same patterns. The data here adds to growing evidence that antecedent uncertainty is a parameter along which indicative conditionals vary, and I suggest that treating this as a component of conditional meaning (either through an operator analysis, or a weakened version of the restrictor view on which conditional connectives have a representation in the formal language that allows them to contribute presuppositional meaning), is more empirically adequate if we want to make conservative assumptions about how conditional expressions within and across lan-

guages differ. Finally, I make a proposal for the implementation of this parameter for *jodi* within a framework drawing on Gillies (2010) and Kaufmann (2005).

The rest of the paper is structured as follows: Section 1.2 introduces the existing proposals about antecedent uncertainty in *if*-conditionals. In Section 2, I present the core generalization about *jodi*-conditionals, which is supported by three empirical patterns described in sections 2.2.2, 2.2.3, and 2.2.4. Section 2.3 presents facts about statives antecedents under *jodi*. Section 3 situates the proposal within the broader debate of operator vs restrictor approaches to conditionals by discussing recent proposals about various antecedent uncertainty requirements in conditional constructions across languages. The formal analysis is developed in Section 4, and Section 5 concludes.

1.2 Antecedent uncertainty and iffiness of *if*

In this section, I set intuitions about what an invariant meaning contribution of 'antecedent uncertainty' amounts to, introduce the relevant observations about *if* from existing literature, and highlight certain properties of the kind of meaning that *if* has been argued to contribute. Recall that the operator approach assumes that natural language conditional expressions encode a core invariant 'conditional' meaning. One kind of evidence forwarded in favor of this is that conditional constructions appear to differ in meaning from syntactically similar adverbial constructions such as *when p,q*. If *if* and *when* uniformly mark antecedent restriction and do nothing else, we would expect identical behavior when they restrict the same quantificational domain. However, pairs like (2a) and (2b) suggest otherwise.

(2) a. When Peter wakes up, he will make coffee.
b. ?? If Peter wakes up, he will make coffee.

Given that the only difference between sentences (2a) and (2b) is the connective, the contrast arguably arises from the semantics of *if* (vs *when*). This view is articulated in Von Fintel and Iatridou (2002). Alongside *when*, the authors examine contrasts between *if*-constructions and other non-conditional constructions such as relative clauses while restricting the same quantifiers, and conclude that across all relevant uses, *if*-constructions have some meaning in common. This leads them to propose that conditionals are 'iffy': *if* adds some meaning akin to the speaker's uncertainty about the antecedent.[3] The contrast between (2a) and (2b) is diagnosed as follows: the *if*-construction, but not the *when*-construction, seems to suggest that there is uncertainty about whether or not Peter will wake up. In an ordinary context, given our world knowledge that waking up each day is not open to question, the *if*-construction is odd.

[3] A note on terminology: the term *iffiness* has been used slightly differently by different authors. While Gillies (2010) uses it as a proxy for the operator view, Von Fintel and Iatridou (2002) use it to also signal a certain kind of semantic property that they take to be contributed by the connective. To say that *if*-conditionals are 'iffy' by this use amounts to saying that *if* contributes a meaning related to uncertainty about the antecedent. This of course entails that the connective contributes *some* meaning, which is the premise of the operator view. In this paper, I use the term 'iffiness' in the narrower sense, to signal a specific kind of meaning contribution relating to uncertainty. I use the term *operator view* in place of Gillies (2010)'s broader use.

The following pair of sentences from Gillies (2010), with an overt epistemic modal in the consequent, illustrates a similar contrast between *if* and *when*, this time resulting in an acceptable reading with *if* but an odd reading with *when*:

(3) Context: The Chicago Cubs have not been performing well in the season so far.
   a. If the Cubs get good pitching and timely hitting after the break, they might win it all.
   b. ? When the Cubs get good pitching and timely hitting after the break, they might win it all.

Gilles diagnoses the contrast as follows: 'I can say something true-if-hopeful with [3(a)]. But [3(b)] passes optimistic and heads straight for delusional.' Here, the relevant world-knowledge (for those who possess it) makes the antecedent clause uncertain (and perhaps even unlikely). In a neutral context, the *if*-construction is perfectly acceptable, whereas the *when*-construction is odd. Of relevance to us is the fact that once again, the use of *if* somehow conveys that the speaker is uncertain about the truth of the antecedent clause, a meaning that is lacking in the construction with *when*.

Together, the contrasts in (2) and (3), with further evidence from Von Fintel and Iatridou (2002) that is not reproduced here, suggest that an antecedent clause is acceptable under *if* iff it expresses a proposition whose truth or falsity the speaker does not already know. That is, the speaker holds an attitude of ignorance towards the proposition at the evaluation time. The extent to which the use of *if* is acceptable depends on the extent to which such an attitude is justified. To reinforce this, consider the following example, differing minimally from (2b):

(4) If Peter wakes up early, he will make coffee.

While waking up does not admit ignorance in most neutral contexts, waking up early is more easily construed as admitting ignorance, making the use of *if* acceptable. This is the relevant idea of 'antecedent uncertainty' argued to be contributed by *if*, articulated in Von Fintel and Iatridou (2002)'s idea that *if*-conditionals are 'iffy'.

Here, it will be useful to highlight two further properties of this meaning contribution. First, context plays a role: (2b) is odd because in most neutral contexts there is no reason to doubt whether Peter will wake up, but it becomes acceptable in a context where Peter is known to be on his deathbed. Second, the sharpness of the acceptability judgments is related to how conventionalized the relevant knowledge about the antecedent is: people waking up every morning is more conventionalized than the Chicago Cubs being unlikely to improve, resulting in a sharper contrast and lesser contextual support required in (2) compared to (3).

In the following sections, I show that the constraints on *jodi*-antecedents have similar properties, subsume the requirement for speaker ignorance described above, and further require the antecedent clause to express a proposition about the future. As described informally in section 1.2, propositions that are both unknown to the speaker and about the future admit an attitude that signals a stronger form of uncertainty, i.e. the presumption that the truth of the antecedent proposition is undecided at the evaluation time.

2 Antecedent restrictions in *jodi*-conditionals

2.1 Scope of data

I focus on indicative conditionals. Like *if*, *jodi* can also form counterfactual conditionals (the antecedent is implicated to be false), and relevance conditionals (the consequent is not truly conditional on the antecedent being true). I put aside these uses here. Moreover, in addition to *jodi*, Bangla has at least two other ways of expressing conditional meaning: the conditional participial *-le*, and the discourse particle *toh*. Since I am interested in the potential semantic contribution of conditional connectives, I focus on *jodi* constructions in the rest of the paper. See Guha (2022) and Bagchi (2005) for an overview of different types of conditionals with *jodi*, and other ways of expressing conditional meaning in Bangla.

The empirical pattern of interest here is partly about the interpretation of tense and aspect markers in the antecedent of indicative *jodi* conditionals. As noted in previous research, the stativity of a clause affects its temporal interpretation in modal environments (see, for example, Condoravdi 2002 on modal auxiliaries, and Copley 2008 on stative antecedents in conditionals). In the antecedent of *jodi*, a class of stative clauses pattern separately from all others: these involve so-called K-state predicates (Maienborn, 2005), which include lexical statives (*know French, like coffee, resemble John*), and copular predicates (*be tall, be busy*). Owing to known peculiarities of these predicates, and Bangla-specific facts of multiple copula verbs corresponding to English *be*, K-state predicates in the antecedent introduce additional complexity. I therefore present facts about these predicates separately in section 2.3.

Finally, I limit my primary focus to non-quantified or 'one-case' conditionals (Rumberg and Lauer, 2023), where the conditional claim pertains to a particular situation, rather than a regularity or law. The contrast is sketched below, where sentences (a-c) constitute one-case conditionals, whereas (d-e) do not.

(5) a. If he wakes up early tomorrow, he will make coffee.
b. If he drinks coffee, he will enjoy this tour.
c. If he likes coffee, he must own an espresso machine.
d. If he wakes up early, he makes coffee .
e. If a person likes coffee, they own an espresso machine.

(d-e), but not (a-c), can be understood as: *usually/always,(if p, then q)*. Note that this is independent of whether the antecedent clause itself expresses something generic (e.g. in b, c, e) or particular (e.g. in a). The relevant contrast is whether the conditional claim as a whole is taken to be law-like.

2.2 Restrictions on *jodi* eventive antecedents

I now present facts about *jodi* conditionals. These pertain to the kinds of antecedent clauses that are acceptable under *jodi*, which I show are a subset of those acceptable under *if*. As far as I am aware, there are no antecedent clauses that can appear under *jodi* whose translation-equivalents are disallowed with *if*. As discussed informally in section 1, *if* is acceptable with antecedents that express propositions towards which the speaker holds an attitude

of ignorance at evaluation time, whereas *jodi* is acceptable with antecedents that express propositions towards which the speaker holds an attitude of presumed undecidedness. I now spell out this attitude in greater detail, and show that for any agent, the set of propositions that admit it is a subset of those that admit ignorance.

While Von Fintel and Iatridou (2002)'s proposal is novel in identifying that the meaning of antecedent uncertainty persists across a broad range of *if*-constructions, the idea that indicative conditionals express or require uncertainty about the antecedent is not without precedence. For example, Stalnaker (1976) takes indicative conditionals to presuppose that the antecedent is compatible with the context set (the set of propositions that conversational participants take to be mutually believed). Although Von Fintel and Iatridou (2002) discuss the idea of *iffiness* at an intuitive level, by taking *if* to presuppose that the antecedent is compatible with a contextually-given domain of worlds, they do not explicitly characterize what the relevant domain is, and stop short of providing a formally explicit treatment of the notion. To enable a thorough comparison with the *jodi* facts, let us cast the meaning contribution proposed by Von Fintel and Iatridou (2002) for *if* into a familiar Katzerian system of modal logic (Kratzer, 1981), which will then be used to define the constraint of *jodi*.

Section 1.2 identified that this meaning: (i) can be characterized as an attitude of ignorance towards the proposition expressed by the antecedent, echoed in Von Fintel and Iatridou (2002)'s diagnosis that *if*-clauses somehow express that there is a 'question of whether p'; (ii) is sensitive to information and assumptions in the conversational context; (iii) is sensitive to how conventionalized the relevant antecedent fact is. These suggest that the meaning relates to the knowledge of the speaker (or conversational participants) in a given context. Following Kratzer (1981), modal claims are taken to made against implicit or explicit bodies of information (conversational backgrounds):

(6) (According to the timetable) The plane must leave at 5 pm.

(7) (According to my knowledge) The plane might leave at 5:30 pm.

For bare indicative conditionals (i.e. those lacking an overt modal in the consequent), this is often understood as the epistemic state of the speaker— the set of propositions that the speaker believes at evaluation time and context (Gillies, 2010). [4] Von Fintel and Iatridou (2002)'s notion of there being a 'question of whether p' can be made concrete as a presupposition of the speaker's ignorance towards the proposition expressed by the antecedent, modeled as a constraint on the status of the antecedent with respect to the conversational background:

(8) a. **Von Fintel and Iatridou (2002)'s iffiness for *if***: Given a context c, *if p, then q* evaluated at a world w and time t presupposes that the speaker of c bears an attitude of ignorance towards p at t in w.

b. **Ignorance**: An agent in a context c bears an attitude of ignorance towards a proposition p at a world w and time t iff the agent's epistemic modal base in c,w,t contains at least one p world and at least one $\neg p$ world.

[4] Throughout the paper, I use 'epistemic' to signal a non-root modality that concerns the speaker's knowledge or beliefs. This is not necessarily factive.

Once we assume that conditionals can specify constraints on the status of the antecedent clause in the speaker's epistemic state, it raises the question of whether the constraint in (8a) is the only possible constraint that can be specified. I suggest that the answer is 'no': *jodi* involves a parallel constraint, only differing in the exact restriction that is specified on the speaker's epistemic state.

To build towards a definition of this restriction, consider the pair of conditionals below, from Kaufmann (2005). The relevant observation is that even though both constructions convey that the speaker is uncertain about the truth of the antecedent, there is some difference in the nature of this uncertainty between the two cases:

(9) a. If he submits his paper to a journal, we will not include it in our book.
b. If he submitted his paper to a journal, we will not include it in our book.

The intuition is articulated in Funk (1985): 'In the case of [a] the uncertainty is largely due to the fact that the state-of-affairs described and predicated does not yet exist, i.e., is still subject to manifestation (so that it cannot be affirmed or denied– it is unverifiable) at the moment of the sentence being uttered. In [b], however, the state-of-affairs does exist at the time of speaking (either in the positive or negative sense—it is 'manifested' and could thus be verified), but the speaker has not got enough information (or is otherwise not disposed) to be sure about it and hence to affirm or deny it.' This expresses the idea that there is some non-accidental link between our attitude of uncertainty towards a proposition, and how the facts relevant to verifying its truth unfold in time. Under *jodi*, antecedents like (9a) are acceptable, but antecedents like (9b) are unacceptable:

(10) a. jodi o paper-Ta-ke journal-e paTha-ϕ-e, tahole ar amader
if she paper-CLF-ACC journal-LOC send-PRS-3, then anymore our
boi-te publish korbo na
book-LOC publish do.FUT.3 NEG
If she submits the paper to a journal, we will not publish it in our book.
b. ?? jodi o paper-Ta-ke journal-e paTha-l-o, tahole ar amader
?? if she paper-CLF-ACC journal-LOC send-PST-3, then anymore our
boi-te publish korbo na
book-LOC publish do.FUT.3 NEG
Intended: If she submitted the paper to a journal, we will not publish it in our book.

The intuitive link between uncertainty and time described by Funk (1985) can be made precise by translating these ideas into notions from modal logic. I follow the strategy used by Kaufmann (2005) to do this, by introducing a modality that makes a distinction between the past and the future, and positing a certain relation between this modality and epistemic modality.

The asymmetry between a fixed past and an open future is encoded in many tense logics where time is conceived as branching rather than linear (Kamp, 1979; Thomason, 1984). To replicate this in a modal logic where sentences are assigned truth values at a world and time, assume a historical accessibility relation such that for any world w and time t, the historical modal base from w at t has the property of 'Historicity' (formally defined in 46d

in section 4): the worlds in it agree on the truth value of all atomic sentences up until t, but can diverge at times after t. This means that for any sentence S, if its truth at t at w does not depend on facts after t, its truth value will be identical across the historical modal base. Let us say that S is 'decided' at t in w. To link this to an agent's (un)certainty, assume that the property of Historicity is known by all rational agents. This gives the following relation between the historical and epistemic modalities: for any agent, at any w and t, the agent's epistemic modal base will be such that for each world w' in it, the historical alternatives of w' at t will agree on the truth of all sentences whose truth at t does not depend on times after t. Let us make the latter idea precise by saying that the truth of a sentence S of arbitrary complexity 'depends on' times after t if evaluating S at t in w requires evaluating some constituent at a time after t in w. We now arrive at the following relation between a sentence's truth conditions and an agent's attitude towards the proposition it expresses: if evaluating S at t does not involve evaluating any constituent of S at a time after t, S is presumed decided by any rational agent.

Above, we implicitly assumed that the agent did not have any prior belief about S. Next, consider a sentence S' whose truth value is known to the agent. For example, the agent believes that S' is true. What is its status vis-a-vis the presumption of decidedness? Clearly, since the agent believes S' at t in w, S' must be true at t in all the worlds w' in the agent's epistemic modal base. With a reasonable assumption that agents cannot distinguish between worlds that differ only in the future (called 'Lack of foreknowledge' by Kaufmann 2005, formally defined in 48d in section 4), we guarantee that for each w', its historical alternatives must also be epistemically accessible to the agent. But since they are in the epistemic modal base, they must verify S'. This guarantees that for each w' in the epistemic modal base, all the historical alternatives of w' agree on the truth of S': the agent believes S' to be decided.

This gives two conditions under which a (proposition expressed by a) sentence will be presumed decided by an agent at t in w: either (i) its truth conditions at t do not involve evaluating any constituent at any time after t in w, or (ii) the agent knows the sentence to be true or to be false at t (regardless of whether its truth conditions involve evaluating a constituent in the future). Conversely, a sentence fails to be presumed decided at t if it fulfills a conjunctive condition: (i) its truth conditions involve evaluating some constituent at a time after t, *and* (ii) the agent does not know its truth value at t.

Now we are in a position to spell out the proposed constraint on the antecedent of *jodi*-conditionals: *jodi* only admits antecedent clauses that are not presumed decided by the speaker at the evaluation time:

(11) a. **Iffiness of *jodi***: Given a context c, *jodi p, then q* evaluated at a world w and time t presupposes that the speaker of c bears an attitude of presumed undecidedness towards p at t in w.

b. **Presumption of decidedness**: An agent in a context c and world w presumes a proposition p to be decided at time t iff either (i) the agent knows the truth or falsity of p at t in w, or (ii) evaluating the truth of p at t does not require evaluating any constituent of the sentence expressing p at a time after t in w. An agent presumes a proposition p to be undecided at t iff both (i) the agent does not know the truth or falsity of p in w at t, and (ii) evaluating the truth

of p at t requires evaluating some constituent of the sentence expressing p at a time t' after t in w.

In the following sections, I present evidence for this, showing that the clauses that are unacceptable as antecedents under *jodi* are precisely those that fail to be presumed undecided by the speaker at utterance time (UT). This manifests in three patterns: (i) Clauses whose truth is known by the speaker at evaluation time ae unacceptable under *jodi*, paralleling the patterns noted for *if* in section 1.2. (ii) Clauses with past, perfect, and progressive marking are unacceptable under *jodi*. As discussed further in section 2.2.5, under standard accounts all of these tense-aspect categories lead to truth conditions that do not involve future times in the evaluation world. (iii) Clauses with simple present morphology, which are ambiguous between a future interpretation and a habitual-generic interpretation under english *if*, only admit the former interpretation under *jodi*.

To enable the presentation of the data, section 2.2.1 provides some background on the verbal system and tense-aspect morphology in Bangla.

2.2.1 Verbal system of Bangla

Bangla has an inflectional system marking tense and aspect. In addition to this, it patterns with other South Asian languages in having a set of copular auxiliaries that enable further distinctions of aspectual meaning (Deo, 2024; Mahapatra, 2015). A fuller exploration of the multi-copula system and its associated aspectual contrasts is beyond the scope of this work. For present purposes, I focus on clauses with inflectional tense and aspect marking without additional auxiliaries, and assume aspect operators in the formal language: IMPF, PROG, and PERF as translations of the inflectional markers that express imperfective (i.e. habitual-generic), progressive, and perfect meanings respectively. I assume that these occupy the Aspect Phrase (AspP) in the structure.Verbal clauses have the following sequence of morphemes: [verb-aspect-tense-agreement]:

(12) likh-ch-il-am
write-PROG-PST-1
"I was writing"

Present tense (PRES) is morphologically null (ϕ), and there are two past-markers: *-t-* and *-l-*. *-t-* expresses imperfective past, most closely expressed by *used to* in English:

(13) mini henTe skul-e je-t-o
mini walking school-LOC go-*t*-3
Mini used to walk to school (in her childhood).

When *-l-* directly modifies a VP clause, it express perfective past (i.e., a single completed episode in the past):

(14) mini hente baRi ge-l-o
mini walking home go-*l*-3
Mini walked home (yesterday).

However, it can also combine with the progressive and perfect markers to express past progressive and past perfect meanings:

(15) a. mini haanT-ch-il-o
mini walk-PROG-*l*-3
Mini was walking.

(16) a. mini heNT-ech-il-o
mini walk-PRF-*l*-3
Mini had walked.

I translate *-t-* as the aspect operator IMPF modified by the tense operator PAST, and translate *-l-* simply as the past tense operator PAST, assuming that when it combines with a VP unmediated by other aspect markers, its meaning contribution defaults to a perfective past due to competition with the alternative *-t-*. The viewpoint aspect markers include the progressive (PROG: *-ch-*), and perfect (PERF: *ech*). Following a standard view in the literature, I assume that simple present sentences (e.g. the translation-equivalent of *John smokes.*) involve the imperfective aspect operator IMPF under present tense PRES (see Deo 2009; Ferreira 2016, a.o.). Present imperfective is morphologically null in Bangla.

Finally, Bangla has an inflectional future-marker (*-b-*), which has limited acceptability under *jodi*. Since the oddness of future-markers in conditional antecedents is a cross-linguistically common phenomenon and its cause an open question, I will treat it as an independent fact and not attempt to account for it here (for discussions see Cariani and Santorio 2018; Kaufmann 2005 and references therein).

2.2.2 Constraint A: epistemic status of antecedent clause

Just like *if*, *jodi*-conditionals are unacceptable with antecedents that express propositions whose truth or falsity is known by the speaker at evaluation time. This was demonstrated for *if* in section 1.2 based on observations from Von Fintel and Iatridou (2002). All the relevant patterns are replicated for *jodi*-conditionals. First, recall the contrast between *if* and *when* in (2), repeated below:

(17) a. When Peter wakes up, he will make coffee.
b. ?? If Peter wakes up, he will make coffee.

In a similarly neutral context, a parallel contrast is seen between *jodi* and *jokhon* (the translation-equivalent of *when*):

(18) a. jokhon Peter ghum theke uth-b-e, o coffee banabe
when peter sleep from rise-FUT-3, he coffee make-FUT-3
When Peter wakes up, he will make coffee.

b. ?? jodi peter ghum theke oth-ϕ-e, o coffee bana-b-e
?? if peter sleep from rise-PRS-3, he coffee make-FUT-3
?? If Peter wakes up, he will make coffee.

Unlike English *when*, Bangla *jokhon* requires the future-marker in the antecedent for future reference, but this notwithstanding, the intuitions underlying the contrast are exactly the same. Just like its English translation-equivalent in (4), the *jodi*-construction improves

when the temporal modifier 'early' results in a clause that is more easily conceived as admitting speaker ignorance:

(19) jodi peter taratari ghum theke oth-ϕ-e, o coffee bana-b-e
if peter early sleep from rise-PRS-3, he coffee make-FUT-3
If Peter wakes up early, he will make coffee.

2.2.3 Constraint B: tense-aspect marking

jodi is more restricted than *if* in the tense-aspect markers that are permitted in its antecedent clause. To set intuitions, consider the following conditionals with *if*, all of which are acceptable:

(20) Context: Mini is prescribed medication that needs to be taken only once a week. It is the middle of the week now.
   a. If she takes the medicine today, she will not take it tomorrow.
   b. If she took the medicine yesterday, she will not take it tomorrow.
   c. If is taking the medicine now, she will not take it tomorrow.
   d. If she has taken the medicine already this week, she will not take it tomorrow.
   e. If she used to take the medicine before food last year, she will continue to do the same now.

While the corresponding *jodi* conditional is acceptable with an antecedent clause paralleling (a), antecedent clauses paralleling (b; perfective past), (c; progressive), (d; perfect), and (e; imperfective past) are all unacceptable:

(21) a. jodi o aj oshudh kha-ϕ-e, agami kal khabe na
if she today medicine eat-PRS-3, tomorrow eat.FUT.3 NEG
If she takes the medicine today, she will not take it tomorrow.

   b. ?? jodi o goto kal oshudh khe-l-o, agami kal khabe na
?? if she yesterday medicine eat-PST-3, tomorrow eat.FUT.3 NEG
Intended: If she took the medicine yesterday, she will not take it tomorrow.

   c. ?? jodi o ekhon oshudh kha-ch-ϕ-e, agami kal khabe na
?? if she now medicine eat.PROG-PRS-3, tomorrow eat.FUT.3 NEG
Intended: If she is taking the medicine now, she will not take it tomorrow.

   d. ?? jodi o ei soptahe oshudh khe-ech-ϕ-e, kal khabe na
?? if she this week.LOC medicine eat-PRF-PRS-3, tomorrow eat.FUT.3 NEG
Intended: If she has taken the medicine this week, she will not take it tomorrow.

   e. ?? jodi o goto bochhor khawar aage oshudh khe-t-o, ekhon-o
?? if she last year eat.INF.GEN before medicine eat-IPFV.PST-3, now-too
tai korbe
that do.FUT.3
Intended: If she used to take the medicine before food last year, she will continue to do the same now.

The temporal adverbials *today, tomorrow, now, last year* serve to reinforce the intended interpretation but are optional in all cases for both *jodi* and *if*; the contrast persists regardless of adverbial modification. This shows that while simple present morphology can appear in the antecedent of *jodi*, the morphological markers that express past tense, progressive aspect, perfect aspect, and imperfective aspect in unembedded clauses are unacceptable under *jodi*. Past-inflected progressive and perfect marking are likewise unacceptable. This pattern of restricted tense-aspect marking under *jodi* has been noted before in Bagchi (2005) and Bhattacharya (1998). Both authors have different aims than the current paper. Bagchi (2005) is concerned with the syntactic properties of conditional constructions, and takes the restricted tense-aspect marking in the antecedent to be evidence for its syntactic status as a subordinate clause. However, she does not attempt to explain the restrictions or discuss their connection to the meaning of the clause. Bhattacharya (1998) is concerned with arguing for the presence of subjunctive mood in Bangla. The observation about restricted tense-aspect marking in *jodi* antecedents is among a larger set of observations about environments which he identifies as potentially licensing the subjunctive. The focus is on properties of subjunctive mood and its syntactic licensing, rather than the meaning of the conditional or of the tense-aspect categories that are disallowed.

Finally, note that the restrictions in tense-aspect marking do not reflect a ban against specific morphemes. The markers for perfective past, progressive, perfect, imperfective past are not disallowed simpliciter in the antecedent of *jodi*. They can appear in *jodi*-antecedents if they are in a clause that is embedded under a clause-embedding verb in the antecedent. This fact has not been noted in the existing reports of these restrictions. Contrast the following with their unacceptable counterparts in (21b-d) (the consequents are modified to make plausible utterances; the relevant data is the content of the antecedent clause):

(22) a. jodi ami jante par-ϕ-i je [o oshudh khe-l-o], tahole amar chinta
if I know.INF can-PRS-1 that [she medicine eat-PST-3], then my worry
kombe
reduce.FUT.3
If I learn that [she took the medicine], then I'll stop worrying.

b. jodi dekh-ϕ-o je [o ekhon oshudh kha-ch-ϕ-e], amay bolo
if see-PRS-3 that [she now medicine eat.PROG-PRS-3], I.ACC tell.IMP
If you see that [she is taking the medicine now], let me know.

c. jodi daktar shon-ϕ-e je [o ei soptahe oshudh khe-ech-ϕ-e],
if doctor hear-PRS-3 that [she this week.LOC medicine eat-PRF-PRS-3],
tahole kal khete baron korbe
then tomorrow eat.INF forbid.FUT.3
If the doctor hears that [she has taken the medicine this week], (s)he will advise her not to take it tomorrow.

d. jodi o bOl-ϕ-e je [o goto bochhor khawar aage oshudh
if she say-PRS-3 that [she last year eat.INF.GEN before medicine
khe-t-o], tahole ekhon-o tai korte bolo
eat-IPFV.PST-3], then now-too that do.INF tell.IMP
If she says that [used to take the medicine before food last year], ask her to do the same now.

These conditionals above are acceptable in spite of containing the 'disallowed' markers in the antecedent clause. I take this to show that it is not the presence or absence of certain morphemes, but rather the meaning of the entire antecedent clause, that is relevant for acceptability under *jodi*. Intuitively, the antecedents of (22a-d) are about seeing, hearing, and saying events in the future, unlike the antecedents of (21b-e), which are express episodes or habits of medicine-taking at or before utterance time. As I will discuss more fully in section 2.2.5, the truth conditions of the latter preclude expressing propositions towards the which the speaker can bear an attitude of presumed undecidedness at the utterance time.

2.2.4 Constraint C: interpretation of simple present morphology

In unembedded clauses, simple present morphology with eventive predicates (e.g. *run, drink coffee*) produces a habitual-generic interpretation in both English and Bangla. For example, *Mini drinks coffee* expresses a habit or disposition of Mini. When such clauses appear in the antecedent of an indicative *if*-conditional in English, however, they can express a single future eventuality:

(23) If Mini drinks coffee (tomorrow), she will be jittery during the meeting.

This behavior of simple present clauses in the antecedent of *if*-indicatives has been the subject of much research vis-a-vis understanding the behavior of tense in conditionals (see Kaufmann 2005; Rumberg and Lauer 2023; Williamson 2021; Mendes 2025 a.o. for discussion). Crucially for us, this future-referring behavior is an additional interpretation that is available in the conditional antecedent, but not obligatory. Simple present clauses under *if* can also retain their habitual-generic interpretation, and the two are disambiguated by adverbial modification or context. While reasoning about Mini's behavior during tomorrow's meeting, for example, her specific coffee-drinking episode tomorrow is relevant. In contrast, in a context where we are trying to decide whether Mini might enjoy coffee tours, it is her disposition towards coffee that is relevant, reinforcing the habitual-generic reading of the clause:

(24) If Mini drinks coffee (in general), she will enjoy the coffee tour in Medellin.

Under *jodi*, simple present eventive clauses can likewise get a future interpretation. However, unlike (24), their habitual-generic interpretation is hard to access even with contextual support:

(25) a. Context preferring future interpretation of simple present antecedent

jodi mini (kal) coffee kha-ϕ-e, meeting.er somoy osthir hObe
if mini (tomorrow) coffee eat-PRS-3, meeting.GEN time agitated be.FUT.3

If Mini drinks coffee (tomorrow), she will be agitated during the meeting.

b. Context preferring habitual-generic interpretation of simple present antecedent

?? jodi mini coffee kha-ϕ-e, o medellin.er coffee tour pochhondo
?? if mini coffee eat-PRS-3, she medellin.GEN coffee tour like
korbe
do.FUT.3

Intended: If Mini drinks coffee (in general), she will enjoy the coffee tour in Medellin.

Again, temporal adverbials serve to reinforce the intended interpretation but are not essential to generating the contrast. I provide another pair of examples below. In the future-preferring context, we are reasoning about what effect rains will have on the roads. In the generic-preferring context, we are reasoning about the likelihood of water shortage in a town given its usual weather patterns. We see that while both are equally acceptable with *if* (26), the latter is much less acceptable with *jodi* (27):

(26) a. Unembedded clause: generic reading only
It rains a lot here

b. Conditional antecedent with future-preferring context
If it rains a lot here (next year), these roads will wear out.

c. Conditional antecedent with generic-preferring context
If it rains a lot here (in general), there is probably no water shortage during summers.

(27) a. Unembedded clause: generic reading only

ekhane khub brishti pOR-ϕ-e
here much rain fall-PRS-3

It rains a lot here

b. Conditional antecedent with future-preferring context

jodi (porer bochhor) ekhane khub brishti pOR-ϕ-e, ei rasta-gulo kharap
if (next year) here much rain fall-PRS-3, this road-COP bad
hoye jabe
happen.go.FUT.3

If it rains a lot here (next year), these roads will wear out.

c. Conditional antecedent with generic-preferring context

?? jodi ekhane khub brishti pORe, nishchoi gorom-kaale jol-er
?? if here much rain fall.PRS.3, likely summer.GEN water-GEN
somosshya hOye na
problem happen.NEG

Intended: If it rains a lot here (in general), there is probably no water shortage during summers.

These show that while the conditional antecedent under *jodi* patterns with *if* in licensing a future-referring interpretation of simple present clauses it diverges in disallowing habitual-generic interpretations of simple present clauses. The lack of habitual-generic readings in the antecedent of *jodi* has been noted in Simpson and Syed (2014), although their concerns are very different, investigating negation and finiteness in a variety of constructions.

As with the tense and aspect markers in section 2.2.3, habitual-generic readings of simple present clauses are not banned simpliciter in the antecedent, and can be accessed if the clause in question is embedded further by a clause-embedding verb under *jodi*:

(28) jodi ami shuni je [mini coffee kha-ϕ-e], ami or jonno coffee tour-Ta book
if I hear that [mini coffee eat-PRS-3], I for.her coffee tour-CLF book
korbo
do.FUT.1
If I hear that [Mini drinks coffee (in general)], I'll book the coffee tour for her.

Here, the simple present clause [*she drinks coffee*] receives a habitual-generic interpretation, just like its translation-equivalent with *if*.[5] (28) parallels the pattern in (22) from section 2.2.3 in suggesting that it is the meaning of the entire antecedent clause that is relevant for acceptability under *jodi*: (28), unlike (25b), is about a knowing event in the future, and therefore expresses a proposition towards which the speaker can bear an attitude of presumed undecidedness.

2.2.5 Discussion of generalization: historical modality and attitudes towards the future

The last three sections presented restrictions on the antecedent of *jodi* indicatives, relating to (A): whether the speaker knows the truth or falsity of the proposition at utterance time, (B): the tense and aspect markers that can appear in the clause, and (C): the possible interpretations of simple present morphology in the antecedent. For each, I suggested that the difference between the allowed and disallowed clauses intuitively map on to the property of presumed (un)decidedness at evaluation time. As defined in (11b), to admit an attitude of presumed undecidedness a proposition must satisfy a conjunctive requirement: it must be unknown by the agent at evaluation time, and its truth conditions must depend on a future time in the evaluation world. Intuitively, the antecedents ruled out by Constraint A fail to satisfy the first conjunct, whereas the antecedents ruled out by Constraints B and C fail to satisfy the second conjunct. In this section, I examine the truth conditions of the relevant clauses and show how the constraint as defined in (11b) applies to the examples.

Constraint A (epistemic status) is the simplest to account for: by definition of the presumption of decidedness in (11b), a clause whose truth or falsity is known by the speaker fails to be presumed undecided in the speaker's epistemic state, and is therefore unacceptable under *jodi*. This derives the contrast between pairs like (18b) and (19), repeated below:

(29) a. ?? jodi peter ghum theke oth-ϕ-e, o coffee bana-b-e
?? if peter sleep from rise-PRS-3, he coffee make-FUT-3
?? If Peter wakes up, he will make coffee

b. jodi peter taratari ghum theke oth-ϕ-e, o coffee bana-b-e
if peter early sleep from rise-PRS-3, he coffee make-FUT-3
If Peter wakes up early, he will make coffee

Recall that these contrasts are discourse-sensitive and become sharper as the antecedent fact becomes more conventionalized. Capturing this requires a context-sensitive notion of

[5]Note that in this further-embedded clause, the future-referring interpretation of the simple present is no longer available. This is the case for both *if* and *jodi*-antecedents. As discussed above, there is a substantial body of work on future-referring interpretations of the simple present in conditional antecedents, and its distribution being limited to the clause immediately under *if* has been noted in earlier work (Williamson, 2021).

speaker knowledge, so that, for instance, the proposition that Peter will wake up tomorrow can be 'known' in a neutral context via conventionalized world knowledge. In other words, contextual information (e.g. world knowledge and shared assumptions) directly feeds into the epistemic modal base, which can be implemented by indexing the epistemic modal base not only to a world, time, and agent, but also a context. This further interacts with the attitude of decidedness: if a speaker knows a proposition to be true or false, she presumes that it is decided, regardless of its truth conditions, as captured by the disjunctive definition of decidedness.

This setup allows us to distinguish between two propositions that are both about the future, such as (a) that Peter wakes up tomorrow and (b) that Peter wakes up early tomorrow: in a neutral context, the speaker knows the former (via conventionalized knowledge) but not the latter. The former is therefore presumed decided and ruled out as an antecedent under *jodi*, deriving the unacceptability of (a), while the latter, being unknown as well as future-dependent, is presumed undecided, deriving the acceptability of (b).

Constraints B (tense-aspect marking) and C (interpretation of simple present clauses) concern the second conjunct in the definition of (un)decidedness. Explaining the patterns in sections 2.2.3 and 2.2.4 require some preliminaries and assumptions about tense and aspect. I outline these below and show that, if the presumption of undecidedness is taken to constrain acceptability under *jodi*, standard accounts of tense-aspect categories correctly predict how the clauses pattern under *jodi*.

Two preliminaries are in order. First, I make a simplifying assumption that the truth at t of an untensed VP (which will correspond to atomic sentences in the formal analysis) never depends on times after t.[6] Second, following Deo (2009); Ferreira (2016), I assume that unembedded simple present clauses in English and Bangla have imperfective aspect, yielding habitual-generic readings. The unavailability of this reading in *jodi* antecedents therefore indicates that the constraint rules out present imperfective clauses.

Constraints B and C together predict that past (perfective and imperfective), present perfect, present progressive, and present imperfective clauses are unacceptable as *jodi*-antecedents, while future-referring simple present clauses are acceptable. Intuitively, only the latter require evaluating some constituent at a future time. We now turn to the truth conditions to make this precise.

I assume that tense is existential: the operators PRES and PAST existentially quantify over times that are identical to UT (for PRES) or before UT (for PAST). The operators by themselves do not contribute any meaning-component that makes reference to future times. I diverge here from theories of conditionals that take the present tense to have a non-past semantics and therefore shift the evaluation time to the future in conditional antecedents, e.g. Kaufmann (2005); Rumberg and Lauer (2023); Schulz (2008). Instead, I follow a recent line of work which has argued on independent grounds that when simple present clauses have future-reference in the antecedent of conditionals, this is facilitated by a future-shifting aspectual operator (Williamson, 2021; Matthewson et al., 2022; Mendes, 2025). For

[6]This means that individual lexical items that appear to encode 'futurity' are not treated compositionally. For example, *This is my last cigarette* has a truth value at t given directly by the model and does not require evaluation at later times, despite the reasonable intuition that it's truth might somehow depend on future smoking events due to the meaning of 'last'. The *jodi* patterns in section 2.2.3 do not track this type of futurity.

concreteness, I take this to be prospective aspect (Matthewson, 2012; Matthewson et al., 2022), and assume that it occupies the aspect phrase AspP in the tree.[7]

Turning now to viewpoint aspect, aspect operators introduce a reference time and constrain the embedded VP to be true a time bearing a specific relation to the reference time.

I assume an extended-now account of the perfect operator PERF (Iatridou et al., 2001):

(30) PERF(p) (w,t) = 1 iff $\exists$t' [t$\subseteq_{fin}$t' & p(w,t') = 1]; $\subseteq_{fin}$ gives a final subinterval of t'

A perfect clause such as *Mini has taken medicine* is true at reference time if there is an interval stretching to the left of the reference time during which Mini takes medicine. As the truth conditions show, no times after t in w are involved in evaluating PERF(p) at t in w.

The case of the progressive (PROG) and imperfective (IMPF) requires some more discussion. The semantics of PROG and IMPF has generated a substantial body of research, and accounts differ in whether times after t play any role in determining the truth of a present-tensed progressive or imperfective clause at t. I will argue that, despite these differences, most modern theories converge on the fact that evaluating PROG(p) or IMPF(p) at t in w does not require evaluating the embedded constituents at any future time *in w*.

This conclusion emerges from data concerning the so-called progressive paradox (and its counterpart, the imperfective paradox), which has motivated much of the contemporary research on PROG and IMPF. The paradox arises because the eventuality denoted by an uninflected accomplishment predicate (e.g. *cross the road*; Vendler (1957)) appears to include its culmination: *# She crossed the road but did not reach the other side.* Yet a progressive or imperfective-marked accomplishment predicate can be true even when the culmination never occurs, as in *She was crossing the road at 5pm when she got hit by a bus.* Intuitively, *She was crossing the road* seems true of 5pm regardless of what happens at 5:01. Early extensional accounts of the progressive (e.g. Bennett 1972) incorrectly predicted that facts about the evaluation world after 5pm should affect truth at 5pm, rendering such examples problematic. At the same time, some connection to culmination is clearly required: without it, the truth conditions for *She is crossing the road* would be far too weak. Much of the literature can be understood as an attempt to reconcile these two demands.

One influential response has been to give PROG and IMPF an intensional semantics. On these accounts, culmination must occur at a later time, but only in those modal alternatives that are appropriately related to the utterance time—for example, inertial or otherwise normal continuations (Dowty, 1979a; Deo, 2009; Asher, 1992; Landman, 1992; Bonomi, 1997;

[7] A detailed discussion of the reasons for this choice would lead us far afield from the main argument of the paper, but these include:

i. Non-past PRES accounts like Kaufmann (2005); Rumberg and Lauer (2023) are premised on the assumption of a deep connection between 'scheduled future' readings of the simple present in unembedded clauses (*She leaves tomorrow.*) and future reference in conditional antecedents (*If she leaves tomorrow, ...*). However, Bangla does not allow future readings of simple present unembedded clauses.

ii. Locating the source of future-reference in the tense wrongly predicts that present progressive/perfect clauses should be acceptable under *jodi* with future-progressive/future-perfect readings. However, such clauses are simply unacceptable, suggesting that future-reference in the antecedent is unavailable when AspP is occupied by another aspect operator. This suggests that the source of future-reference is aspectual.

Zucchi, 1999). These theories differ in how they characterize the relevant alternatives, but they share the idea that the facts at the evaluation time are sufficient to determine them.

A second family of approaches retains an extensional semantics for PROG and IMPF, while revising the semantics of accomplishment predicates so that the truth of PROG(P) at t can be determined solely based on facts at evaluation time as long as they stand in the right relation to a completed P-event. Examples include Nadathur and Siegal (2022), Parsons (1990), Szabó (2008).

Abstracting away from the details, these approaches converge on a single prediction: the truth of PROG(p) at a time t in w does not depend on future times *in w*. Whether or not future times enter into the semantics, the truth conditions fail to be future-dependent. Thus, PROG(p) and IMPF(p) fail to satisfy the second conjunct of the definition of presumed undecidedness. This makes it natural to group PROG and IMPF with PAST and PERF, which exhibit the same modal profile. I take this to be a virtue of the generalization: it identifies a natural class for the disallowed clauses under *jodi* while remaining compatible with most contemporary analyses of the progressive and imperfective.

As mentioned above, I assume that simple present antecedents with future-reference involve prospective aspect, which simply shifts the evaluation time of the embedded VP forward:

(31) $F(p)\ (w,t) = 1$ iff $\exists t'$: $t < t'$ & $p(w,t') = 1$

The truth conditions above are a simplification. Since simple present clauses can have future reference only in specific environments, a fully adequate semantics of this aspect must constrain its distribution appropriately. However, since I am only concerned with conditional antecedents here, I limit myself to the simplified truth conditions above, which suffice to show that the truth of a future-referring antecedent clause at evaluation time will require evaluating the embedded VP at a future time in the evaluation world. For a fuller discussion of the distribution of this operator, see Williamson (2021) and Mendes (2025). A simple present antecedent with future reference, such as *Peter wakes up early*, has the following LF:

(32) $_{\text{TP}}$ PRES [$_{\text{AspP}}$ F [$_{\text{vP}}$ Peter-wake-up-early]

Given the denotation of F above, as long as the truth is not already known at evaluation time, this clause is correctly predicted to be acceptable under *jodi*.

2.3 Restrictions on *jodi* stative predicates

Verb phrases are often taken to denote sets of eventualities. Based on their behavior across a range of linguistic environments, Maienborn (2005) distinguishes between predicates that denote (sets of) events, Davidsonian (D-)states, and Kimian (K-)states. The latter include lexical statives (*know French, like coffee, resemble John*), and copular clauses (*be tall, be busy*). When we consider K-state predicates under *jodi*, independent facts about these clauses introduce additional complexities. According to definition (11b), to be presumed undecided a clause must satisfy a conjunctive requirement, being (i) unknown to the speaker at evaluation time, and (ii) dependent for its truth or falsity on future times in the evaluation world. K-state predicates are straightforwardly subject to the first conjunct: a K-stative

clause whose truth or falsity is known by the speaker at evaluation time is unacceptable as a *jodi*-antecedent. However, their interaction with the second conjunct is less clear. Let us consider lexical statives and copular clauses in turn.

Recall from section 2.2.3 that clauses with perfective past, imperfective past, progressive, and perfect marking are unacceptable under *jodi*. This carries over to lexical stative clauses. Whereas lexical statives are generally unacceptable with progressive, perfect, and perfective past marking even in unembedded clauses (c.f. parallels in English: *?? Mini is knowing French*), they can be inflected with imperfective past to express that the state held at a past time, as in (33a). However, (33b) shows that the same clause is unacceptable in the antecedent of *jodi*:

(33) a. mini french jan-t-o
mini French know-IPFV.PST-3
Mini used to know French (as a child).

b. ?? jodi mini french jan-t-o, tahole abar sikhte parbe
?? if mini French know-IPFV.PST-3, then again learn.INF can.FUT.3
Intended: If Mini used to know French (as a child), she will be able to learn it again.

This shows that the temporal properties of the clause still matter for acceptability under *jodi*, as expected. This picture is complicated when we consider simple present clauses. Simple present lexical statives under *jodi* can express future-referring meanings like their counterparts in section 2.2.4:

(34) Context: Mini is considering moving to Nepal next year.

jodi mini nepali jan-ϕ-e, tahole or kono osubidha hObe na
if mini Nepali know-PRS-3, then she.GEN any discomfort happen.FUT.3 NEG

(By the time she moves) If Mini knows Nepali, she won't have any trouble.

However, lexical statives with simple present morphology under *jodi* are also compatible with a reading where the VP is already true at evaluation time:

(35) a. jodi mini french jan-ϕ-e, tahole o chhoto belay sikhechhe
if mini French know-PRS-3, then she childhood.LOC learn.PRF.PRS.3
If Mini knows French, she learnt it as a child.

b. jodi mini coffee pochhondo kO-ϕ-re, or kachhe nishchoi espresso
if mini coffee like do-PRS-3, she.GEN near surely espresso
machine ache
machine COP
If Mini likes coffee, I bet she owns an espresso machine.

Unlike other predicate-types, therefore, simple present lexical statives appear to be optionally, rather than obligatorily, future-referring under *jodi*. A somewhat similar (though not identical) contrast between stative and eventive clauses in their temporal interpretation in a modal environment has been noted under English modal auxiliaries by Condoravdi (2002):

(36) a. He may win.
b. He may be sick.

The observation is that under *may*, the eventive prejacent in (36a) is obligatorily future-referring (no interpretation where he is currently in the act of winning), whereas the stative prejacent in (36b) is optionally future-referring (there is an interpretation where he is currently sick). For Condoravdi (2002), such contrasts motivate a difference in what it means for stative vs eventive clauses to be instantiated at a time interval. The truth conditions of the antecedent clauses in (35a,b) thus depend on assumptions about the instantiation properties of lexical statives, and depending on details of implementation, the pattern above may motivate a refinement of the second conjunct of the definition of presumed undecidedness to accommodate simple present lexical stative antecedents.

Turning to copular clauses, the relevant fact is that in Bangla, it is not obvious if the translation-equivalents for clauses like *Mini is tall* and *Mini is busy* have the same semantic content in the antecedent of conditionals as in unembedded clauses. As a result, the truth conditions of the resulting antecedent clauses depend on ancillary assumptions. Bangla has four copula verbs that correspond to the English *be* across different linguistic environments (*hO,thak,ach,* and a null strategy Φ). These are not merely allomorphs, and encode semantic differences. Three facts about the distribution are important for our purposes: (i) the clauses that translate to *Mini is tall* and *Mini is busy* in unembedded clauses are unacceptable in the antecedent of *jodi*. This is demonstrated in the contrast between the pairs below, where the conditionals in (b) have as their antecedent the clause in (a):

(37) a. Unembedded clause: Φ

mini lOmba Φ
mini tall Φ

Mini is tall.

b. *jodi*-antecedent: Φ: unacceptable

?? jodi mini lOmba Φ, o baksho-ta namate parbe
?? if mini tall COP-PRS-3, she box-CLF lower.INF can.FUT.3

Intended: If Mini is tall, she will be able to retrieve the box (from the top shelf).

(38) a. Unembedded clause: *ach*

mini byasto *ache*
mini busy *ach*.PRS.3

Mini is busy.

b. *jodi*-antecedent: *ach*: unacceptable

?? jodi mini byasto *ache*, o tomader sathe kotha bolte parbe na
?? if mini busy *ach*.PRS.3, she you.GEN with talk.INF can.FUT.3 NEG

Intended: If Mini is busy, she won't be able to talk to you.

(ii) The intended antecedent meanings can be expressed under *jodi*, but require different copula verbs:

(39) a. *jodi*-antecedent: *hO*

jodi mini lOmba hO-ϕ-e, o baksho-ta namate parbe
if mini tall COP-PRS-3, she box-CLF lower.INF can.FUT.3

If Mini is tall, she will be able to retrieve the box (from the top shelf).

b. *jodi*-antecedent: *thak*

jodi mini byasto thake, o tomader sathe kotha bolte parbe na
if mini busy *thak*.PRS.3, she you.GEN with talk.INF can.FUT.3 NEG

If Mini is busy, she won't be able to talk to you.

(iii) However, unembedded clauses corresponding to the antecedents above have a different interpretation:

(40) a. Umembedded clause: *hO*: iterated inchoative reading

mini lOmba hOye
mini tall *hO*.PRS.3

Mini (regularly/repeatedly) becomes tall.

b. Umembedded clause: *thak*: iterated reading

mini byasto thake
mini busy *thak*.PRS.3

Mini (regularly/repeatedly) remains busy.

To understand whether the behavior of copular clauses under *jodi* is captured by the current definition of presumed undecidedness, we need to know the truth conditions of the antecedents in (39a) and (39b). It is not clear what these should be, and a fuller exploration of the four-copula system of Bangla is beyond the scope of the present work. If we take the antecedents of (39a) and (39b) at face value, then copular clauses, like lexical statives, also appear to be optionally future-referring under *jodi*— they can express a reading where the relevant state holds in the future, but are also compatible with the state already holding at evaluation time. The examples below demonstrate both readings for a copular clause antecedent using *thak*:

(41) a. jodi mini ekhon byasto thake, oke disturb koro na
if mini now busy *thak*.PRS.3, she.ACC disturb do.IMP NEG
If Mini is busy now, don't disturb her.

b. jodi mini kal byasto thake, o tomader sathe kotha bolte
if mini tomorrow busy *thak*.PRS.3, she you.GEN with talk.INF
parbe na
can.FUT.3 NEG
If Mini is busy tomorrow, she won't be able to talk to you.

To summarize, the proposed constraint on *jodi* antecedents is that they must express a proposition that is presumed undecided by the speaker at evaluation time, which is defined via a conjunctive requirement: the truth or falsity of the clause should not be known by the speaker at evaluation time, and the truth conditions of the clause must involve evaluating

some constituent at a future time in the evaluation world. K-state predicates are straightforwardly subject to the first conjunct of the definition. While there are clear constraints on their possible temporal interpretations under *jodi*, however, independent properties of these predicates make it so that whether these constraints are adequately captured by the second conjunct as currently stated depends on ancillary assumptions about the instantiation properties of lexical statives (what is means for a stative to be true at a time interval) and semantic contributions of the four-copula system of Bangla. Trying to resolve these complexities would take us too far afield in the present work. To avoid this, I refrain from specifying instantiation properties based on lexical aspect, instead working with a propositional system in the formal analysis in section 4, and assume that supplementing this with an appropriate account of aktsionsart can derive the optional future-reference in simple present K-state predicates.

3 Iffiness and the operator view of conditionals

I turn now to the second aim of the paper, discussing how the facts about *jodi* above bear on the broader debate between operator vs restrictor-only approaches to conditionals. For many intents and purposes, the two can be seen as notational variants of each other (see Kaufmann and Kaufmann 2015 for discussion). They converge on the idea that a conditional without an overt modal in the consequent expresses epistemic necessity relativized to antecedent-worlds. Their primary difference boils down to the fact that an operator approach takes the epistemic necessity modal to be introduced by the conditional connective itself: each instance of the connective introduces an operator of epistemic necessity, by virtue of its meaning contribution. However, the restrictor approach takes the modal to be independent of the conditional connective. For example, Kratzer (1981) assumes that in the absence of an overt modal in the consequent, a covert epistemic necessity modal is inserted into the structure by default. As noted by Kaufmann and Kaufmann (2015), once we assume a system where covert epistemic necessity modals can be independently introduced, a conditional with an overt modal *Mod* in the consequent (*IF p, then Mod q*) is predicted to be ambiguous between two structures: (i) *Mod* is directly modified by the IF-clause; (ii) *Mod* is out-scoped by a silent epistemic necessity modal, which is modified by the IF-clause. The operator approach does not predict such ambiguity, since each occurrence of the conditional connective is accompanied by the single epistemic necessity modal it introduces. Thus when we consider conditionals with an overt modal in the consequent, only the restrictor analysis predicts a structure where the IF-clause directly modifies *Mod*. Below, I show that the patterns of restriction on *jodi* antecedents cast doubt on the availability of such a structure. This observation is similar in spirit to Von Fintel and Iatridou (2002)'s, in that the conditional appears to retain an invariant meaning across a set of constructions that is hard to reconcile with an analysis where the connective makes no meaning contribution in the structure. Finally, I outline recent work on a wider variety of conditional connectives across languages and suggest that the operator approach lends itself to a conceptually simpler account of the variation.

3.1 *jodi*-conditionals with overt modals in the consequent

The conditional constructions discussed so far did not contain any overt modals. Let us now consider conditionals with overt non-epistemic modals in the consequent. For such conditionals, the restrictor analysis predicts the possibility of a structure without any epistemic modal. Since the proposed restriction for *jodi* (11a) concerns the status of its antecedent clause in an epistemic modal base, we expect that a conditional which purportedly lacks any epistemic modal can admit a reading where the said restriction fails to hold. However, this is not borne out. Even with overt non-epistemic consequent modals, the antecedent restriction of *jodi* remains the same. For illustration, consider the analogs of examples (42) and (21) from section 2 with overt deontic necessity modals in the consequents:

(42) a. ?? jodi peter ghum theke oth-ϕ-e, oke gate-ta khulte hObe
?? if peter sleep from rise-PRS-3, he.DAT gate-CLF open *mod*
?? If Peter wakes up, he has to unlock the gate.

b. jodi peter taratari ghum theke oth-ϕ-e, oke gate-ta khulte hObe
if peter early sleep from rise-PRS-3, he.DAT gate-CLF open *mod*
If Peter wakes up early, he has to unlock the gate.

(43) a. jodi o aj oshudh kha-ϕ-e, agami kal khete hObe na
if she today medicine eat-PRS-3, tomorrow eat *mod* NEG
If she takes the medicine today, she does not have to take it tomorrow.

b. ?? jodi o goto kal oshudh khe-l-o, agami kal khete hObe na
?? if she yesterday medicine eat-PST-3, tomorrow eat *mod* NEG
Intended: If she took the medicine yesterday, she does not have to take it tomorrow.

The contrasts show that the antecedent restrictions on *jodi*-conditionals are retained even in the presence of an overt non-epistemic modal in the consequent. The pattern extends to other modal flavors. There is no reading where the antecedent restriction is obviated, or changes with the modal flavor of the consequent. This is unexpected under a restrictor-only analysis where the IF-clause is independent of the modal it quantifies over, and makes no meaning contribution beyond marking a restriction on the domain of the modal. Instead, the *jodi* patterns suggest that the conditionals above always involve a covert epistemic necessity modal, with their acceptability being mediated by the status of the antecedent clause in the quantificational domain of this modal. This idea has precedence in the literature– based on independent empirical facts, Frank (1996) proposes that deontic modals in the consequent of *if*-conditionals are never directly restricted by the *if*-clause; a covert epistemic modal always intervenes.

3.2 Iffiness-es across connectives and languages

Although research on conditionals has largely revolved around the word *if*, recent work on different conditional connectives within and across languages suggests that many of these encode lexically specific uncertainty requirements of various 'flavors'. A recent analysis of German *falls* by (Kaufmann et al., 2024), for example, proposes that *falls*(A)(B) is acceptable

only in contexts where there is some salient agent who actively entertains the question of 'whether A'. That is, *falls* presupposes that its antecedent proposition is an active open question in some agent's attitudinal state. This is again a more specific form of uncertainty than that invoked by *if*.

A constraint very similar to that proposed above has been proposed by Arita (2009) as a basis for the contrast encoded in the system of conditional connectives in Japanese. Japanese has four main conditional expressions: *-eba, -tara, -nara, -n(o)nara*. The author proposes that the choice of conditional in a given construction reflects the speaker's stance towards the antecedent: *-eba / -tara* are specified for historically unsettled antecedents, *-nara and n(o)nara* for historically settled antecedents, with *-n(o)nara* additionally marking epistemic ignorance. This shows that the constraint proposed here is paralleled in the grammar of an unrelated language. Moreover, this might hold tendentially for the connective *in the event* in English.[8]

Examining the Turkish conditional *-se* with aorist-marked antecedents, Soykan (2021) reports restrictions on the possible interpretations of the antecedent that similar to the semantics of *jodi*-conditionals. The marker *-(a/i)r-*, termed 'aorist' in Turkish linguistics, has a semantics similar to the simple present in many Germanic languages– in unembedded clauses, it can have a characterizing interpretation, or a future-referring interpretation. In the antecedent of single-case conditionals, however, the aorist-marked clauses can only be interpreted as future-referring. Although the analysis focuses on the aorist rather than the conditional connective, Soykan further points out that the conditional in Turkish is more restricted than *if* in the kinds of temporal relations that are allowed between the antecedent and consequent.

In the present work as well as the studies discussed above, a working assumption is that uncertainty is specified in some way in indicative conditional connectives, contrasting with syntactically similar adverbials like *when* in English, *wenn* in German, etc, which are underspecified in this respect. The other logical possibility is that the latter set of connectives are specified for the opposite, i.e. they require the antecedent clause to be certain some sense, deriving 'uncertainty' in conditionals as a strengthened implicature. This is the approach taken by Yeom (2004) in analyzing the semantics of two conditional markers in Korean: *-(u)myeon* and *-ta/la-myeon*. Based on restricted distribution and interpretation across indicative and counterfactual uses, the author proposes that the latter presupposes that the antecedent is historically settled at the evaluation time, whereas the former is underspecified in this respect. It is possible that one of these approaches is more empirically adequate, or that conditional connectives can in theory specify either antecedent openness or settledness against various modal bases. The relevant fact is that they uniformly show antecedent (un)certainty to be a viable dimension of contrast in the semantics of indicative conditionals.

This brief survey of connectives across languages shows an emerging typological picture: antecedent uncertainty as a linguistically-relevant dimension of contrast in indicative conditional meaning across connectives. This provides a promising direction of future work, as a point of departure in understanding the 'moving parts' of conditional meaning.

Of relevance to the operator-vs-restrictor debate, this cross-linguistic picture raises the

[8] Author's observation. A sample of 100 randomly selected occurrences of *in the event*-conditionals in the Corpus of Contemporary American English shows only four instances of ontically-settled antecedents.

following question: do these different expressions of conditional meaning have anything in common? If so, what explains the variation in their antecedent properties? We have a conceptual trade-off: under an operator view (or a weakened restrictor approach), the differences can be located in a presuppositional meaning-component, contributed by the connective as one component of 'conditional' meaning and subject to lexical variation, while maintaining a uniform assertive meaning for conditionals across languages. We can derive the observed variation by adding a parameter related to antecedent uncertainty within any existing, off-the-shelf analysis of *if*-conditionals to model the meanings of these various constructions. By contrast, a restrictor-only view must locate the variation in the modals that are restricted in each construction, and would therefore require positing different covert modals. As discussed in the previous section, moreover, this proliferation of independently-introduced covert modals over-generates, wrongly predicting structures where the antecedent restrictions are obviated.

4 Formal analysis

In this section, I outline a formal implementation of the constraint on *jodi*-conditionals within a framework building on Gillies (2010)'s operator analysis of *if*-conditionals, which assumes a 'shifty' strict conditional semantics, with the connective shifting the index as well as the context of evaluation for the consequent clause. This specific analysis of conditionals is not essential to my account, which only requires both antecedent and consequent clauses to be tensed clauses. It is used as proof-of-concept that taking antecedent uncertainty to be a parameter across indicative conditionals allows us to formalize the meaning of *jodi*-conditionals using a pre-existing analysis for *if*-conditionals and simply adding expressive resources to represent the specific 'flavor' of uncertainty that is invoked in the presuppositional meaning-component. In case of *jodi*, I have proposed that this involves the attitude of 'presumed decidedness', which interacts with both the temporal properties of the clause and its status with respect to the speaker's knowledge. To express these notions, I use the formal resources from Kaufmann (2005), allowing us to derive the meaning of *jodi* in a modular way.

4.1 The system

I use a propositional language with variables ranging over indices and sentences, constants denoting the relations in the model, and the usual logical connectives. The smallest units of analysis are sentence radicals (correspond to vPs, assuming vP-internal subjects), represented as the set of atomic sentences (At). W is a non-empty set of worlds, and T is a non-empty set of time intervals related by containment $\subseteq$ and precedence $\leq$, such that t$\leq$t' iff no part of t extends beyond t'. Let I = W$\times$T be the set of indices in the model. Ag is a set od agents. Truth is evaluated at indices (world-time pairs) and relativized to a context. I use the variables *i,j,k...* to range over indices. The context c is a tuple consisting (at least) of a unique index $\langle w_c, t_c \rangle$, where w_c and t_c are the utterance world and time (UT), the speaker sp $\in$ Ag, and a set of sentences representing the relevant world knowledge. Unembedded sentences are evaluated at $\langle w_c, t_c \rangle$ by default. The valuation V is a relation on At such that

for any p ∈ At, V(p,⟨w,t⟩) ∈ {1,0}.For any p of arbitrary complexity:

(44) if p ∈ At, p(w,t) = 1 iff V(p,⟨w,t⟩) = 1

(45) $[\![p(w,t)]\!]^c = 1$ iff $p(w_c, t_c) = 1$

4.2 Epistemic and historical modality

Following Kaufmann (2005), assume an accessibility relation R on I× I is *modal* if ⟨w,t⟩R⟨w',t'⟩ implies that t = t', and *temporal* if ⟨w,t⟩R⟨w',t'⟩ implies that w = w'. We will be concerned with the historical accessibility relation ≈, and the epistemic accessibility relation∼.

(46) Properties of the historical accessibility relation ≈

a. It is modal: ⟨w,t⟩≈⟨w',t'⟩ implies that t = t'

b. It is an equivalence relation

c. **Backward-connectedness:** if ⟨w,t⟩≈⟨w',t⟩ and t'<t, then ⟨w,t'⟩≈⟨w',t'⟩
If two worlds are historical alternatives of each other at a given time, they are historical alternatives of each other at all prior times

d. **Historicity:** if ⟨w,t⟩≈⟨w',t⟩, then for all p ∈ At, V(p,⟨w,t⟩) = V(p,⟨w',t⟩)
Historical alternatives agree on the truth values of all atomic sentences

(46c) and (46d) together capture the intuition that historical alternatives at t are completely identical up until t, and may diverge after t. Sentences are thought to be uttered against sets of background information/assumptions (*modal bases*; Kratzer (1981)). A modal base is a modal accessibility relation such that the following holds:

(47) **Consistency of modal bases**: iRj and i≈k jointly imply kRj

That is, a modal base generated in w at any given time t remains consistent across historical alternatives of w at t. The historical accessibility relation ≈ is a modal base. So is the epistemic accessibility relation ∼, to which we turn now. The relation is indexed to an agent a ∈ Ag.

(48) Properties of the epistemic accessibility relation $\sim^a$

a. It is modal: ⟨w,t⟩$\sim^a$⟨w',t'⟩ implies that t = t'

b. It is transitive, serial, and euclidean

c. **Backward-connectedness:** if ⟨w,t⟩$\sim^a$⟨w',t⟩ and t'<t, then ⟨w,t'⟩$\sim^a$⟨w',t'⟩
If two worlds are epistemically accessible from each other at a given time, they are epistemically accessible from each other at all prior times.

d. **Lack of foreknowledge:** if ⟨i⟩$\sim^a$⟨j⟩, then for all k s.t. ⟨j⟩≈⟨k⟩, ⟨i⟩$\sim^a$⟨j⟩
If i can epistemically access j, then i can also access the historical alternatives of j. This means that agents cannot know the future– the epistemic accessibility relation cannot distinguish between two worlds that differ only in the future.

To capture the context-sensitivity of the epistemic modal base as discussed ins section 2.2.5, we add the following postulate:

(49) R is an admissible epistemic modal base for a context c iff $R = \lambda i$. {j: j is compatible with the c-relevant information at i}

Necessity is defined in the usual way:

(50) **Necessity:** For any accessibility relation R, ($\Box_R$ p) (w,t) = 1 iff for all ⟨w',t'⟩ s.t. ⟨w,t⟩R⟨w',t'⟩, p(w',t').

Using these, we can formalize the presumption of decidedness as follows:

(51) **Presumption of decidedness:** ϕ is presumed decided by an agent a at i in c iff $\Box^a_\sim(\phi \rightarrow \Box_\approx\phi)$ at i in c.

As the derivations in section 4.5 show, the properties of $\approx$ and $\sim$ guarantee that ϕ will be presumed decided if either (i) a knows the truth of ϕ at i, or (ii) the truth conditions of ϕ do not depend on future times in the world of i.

4.3 Tense and aspect

Tenses modify sentence radicals (optionally modified by aspect). Present tense is vacuous, past tense is existential.[9]

(52) PRES(p) (w,t) = 1 iff p(w,t) = 1

(53) PAST(p) (w,t) = 1 iff ∃t' s.t. t'<t and p(w,t') = 1

Aspect operators are modifiers of sentence radicals. Assuming standard semantics for the categories as discussed in section 2.2.5: PERF reflects the extended-now account of Dowty (1979b) and Iatridou et al. (2001), PROG and IMPF the modal analysis of Deo (2009), who builds on Dowty (1979b), and F simply shifts the evaluation index forward.

(54) a. PERF(p) (w,t) = 1 iff ∃t' [t$\subseteq_{fin}$t' & p(w,t') = 1]; $\subseteq_{fin}$ gives a final subinterval of t'

b. F(p) (w,t) = 1 iff ∃t': t < t' & p(w,t') = 1

c. PROG(p) (w,t) = 1 iff ∀⟨w',t⟩ s.t. ⟨w,t⟩Inr⟨w',t⟩,$\forall t' \in R^c_t, p(w', t') = 1$; Inr is a modal base giving the set of inertial indices at ⟨w,t⟩, and R^c_t is a contextually-given regular partition on t.

d. IMPF(p) (w,t) = 1 iff ∃t' [t$\subseteq_{nf}$t' & ∀⟨w',t⟩ s.t. ⟨w,t⟩Inr⟨w',t⟩, $\forall t'' \in R^c_{t'}, p(w', t'') = 1$];$\subseteq_{nf}$ gives a non-final subinterval of t', Inr is a modal base giving the set of inertial indices at ⟨w,t⟩, and $R^c_{t'}$ is a contextually-given regular partition on t'.

4.4 The conditional

Since the empirical facts here don't concern the relation between the antecedent and consequent, the exact semantics for the conditional is irrelevant as long as the antecedent is a tensed clause. I treat *jodi* as a two-place predicate of propositions and assume a shifty strict

[9]Since I am only concerned with conditionals in unembedded contexts and assuming that the context supplies the utterance time UT as the evaluation time for the antecedent, this semantics for PRES and PAST makes the same predictions as one where tense is deictic on UT.

conditional analysis from Gillies (2010): a conditional is true at an index ⟨w,t⟩ in a context c if the epistemic modal base in c, updated with the antecedent, entails the consequent. The selectional restriction of *jodi* is treated as a presupposition about the modal status of the antecedent argument:

(55) $[\![jodi(A)(B)(w,t)]\!]^c$ = undefined, if $[\![(\Box^{sp}_{\sim}$ (A $\rightarrow \Box_{\approx}A)(w,t)]\!]^c = 1$. If defined, $[\![jodi(A)(B)(w,t)]\!]^c = 1$ iff $[\![\sim^{sp}\langle$w,t$\rangle\ ]\!]^c \cap [\![A]\!]^c \subseteq [\![B]\!]^{c+A}$, where c+A is a context that is just like c, except that for each admissible modal base R, for all ⟨w,t⟩, $[\![R\langle$w,t$\rangle\ ]\!]^{c+A} = [\![R\langle$w,t$\rangle\ ]\!]^c \cap [\![A]\!]^c$

4.5 Derivations

To formalize the unacceptability of an antecedent whose truth is known by the speaker at utterance time, consider an antecedent p, in a context c:

(56) Speaker knows p:

a. Suppose sp knows p at $\langle w_c, t_c\rangle$. $\Longrightarrow \forall\langle$i$\rangle$ s.t. $\langle w_c, t_c\rangle \sim^{sp}\langle$i$\rangle$, $[\![p(i)]\!]^c = 1$ (1)

b. Consider an arbitrary j s.t. $\langle w_c$,$t_c\rangle \sim^{sp}\langle$j$\rangle$. From (1): $[\![p(j)]\!]^c = 1$ (2)

c. Now consider an arbitrary k s.t. $\langle$j$\rangle \approx \langle$k$\rangle$.

d. From **Lack of foreknowledge**, $\langle w_c, t_c\rangle \sim^{sp}\langle$k$\rangle$

e. From (1), $[\![p(k)]\!]^c = 1$

f. Since k was arbitrary, $[\![\Box_{\approx}$p(j) $]\!]^c = 1$ (3)

g. From (2) and (3), $[\![p \rightarrow \Box_{\approx}$p (j) $]\!]^c = 1$

h. Since j was arbitrary, $[\![(\Box^{sp}_{\sim}$ (p $\rightarrow \Box_{\approx}p))(w_c, t_c)\ ]\!]^c = 1$.

i. $\Longrightarrow [\![jodi(A)(B)(w_c, t_c)\ ]\!]^c$ = undefined

(57) Speaker knows $\neg p$

a. $\forall\ \langle$i$\rangle$ s.t. $\langle w_c, t_c\rangle \sim^{sp}\langle$i$\rangle$, $[\![p(i)]\!]^c = 0$ (1)

b. Consider an arbitrary j s.t. $\langle w_c$,$t_c\rangle \sim^{sp}\langle$j$\rangle$. From (1): $[\![p(j)]\!]^c = 0$

c. $\Longrightarrow [\![p \rightarrow \Box_{\approx}$p (j) $]\!]^c = 1$

d. Since j was arbitrary, $\forall\langle$j$\rangle$ s.t.$\langle w_c, t_c\rangle \sim^{sp}\langle$j$\rangle$, $[\![p \rightarrow \Box_{\approx}$p (j) $]\!]^c = 1$

e. $\Longrightarrow [\![(\Box^{sp}_{\sim}$ (p $\rightarrow \Box_{\approx}p))(w_c, t_c)\ ]\!]^c = 1$

f. $\Longrightarrow [\![jodi(A)(B)(w_c, t_c)\ ]\!]^c$ = undefined

Let us now consider an antecedent (A) of the form 'Mini works/is working/has worked/...' whose truth the speaker does not know at evaluation time. Translating the vP as *mw*. Simple present antecedents are expected to be acceptable under *jodi* with future reference:

(58) Antecedent LF: [$_{\text{TP}}$ PRES [$_{\text{AspP}}$ F [$_{\text{vP}}$ mw]]]

a. $[\![PRES(F(mw))]\!]^c = 1$

b. iff PRES(F(mw)) (w_c,t_c) = 1

c. iff (F(mw)) (w_c,t_c) = 1

d. iff ∃t' [t_c < t' & mw(w_c,t') = 1]

e. Consider an arbitrary w" s.t. $\langle w_c, t_c\rangle \sim^{sp}\langle$w",$t_c\rangle$ (recall that ∼ is modal)

f. Suppose the antecedent is true in c at ⟨w",t_c⟩: $[\![PRES(F(mw))(w'', t_c)]\!]^c = 1$ (1)
g. $\Longrightarrow$∃t' [t_c < t' & mw(w",t') = 1]. Let t' = t1.
h. Consider an arbitrary w' s.t. ⟨w",t_c⟩≈⟨w',t_c⟩
i. Since t_c < t', there is a counter-model where mw(w',t') = 0
j. ¬ ∀⟨w',t'⟩ s.t. ⟨w",t_c⟩≈⟨w',t'⟩, PRES(F(mw)) (w',t') = 1
k. $\Box_{\approx}$ PRES(F(mw)) (w_c,t_c) = 0 (2)
l. from (1) and (2), $[\![PRES(F(mw))\rightarrow\ \Box_{\approx}PRES(F(mw))\ (w'', t_c)\ ]\!]^c = 0$
m. $\Longrightarrow$ $[\![(\Box^{sp}_{\sim}\ (\text{mw} \rightarrow \Box_{\approx}mw))(w_c, t_c)\ ]\!]^c = 0$
n. *jodi*(A)(B) ≠ undefined; A is acceptable in the antecedent

In contrast, inflectional present perfect is correctly predicted to be unacceptable:

(59) Antecedent LF: [$_{\text{TP}}$ PRES [$_{\text{AspP}}$ PERF [$_{\text{vP}}$ mw]]]

a. $[\![PRES(PERF(mw))]\!]^c = 1$
b. iff ∃t' [$t_c \subseteq_{fin}$t' & mw(w_c,t') = 1]
c. Consider an arbitrary w" s.t. ⟨w_c, t_c⟩ $\sim^{sp}$⟨w",t_c⟩ (recall that ∼ is modal)
d. Suppose the antecedent is true in c at ⟨w",t_c⟩: $[\![PRES(PERF(mw))(w'', t_c)]\!]^c = 1$ (1)
e. $\Longrightarrow$∃t' [$t_c \subseteq_{fin}$t' & mw(w",t') = 1]
f. since $t_c$is a *final* subinterval of t', there is no part of t' that extends beyond t_c. Therefore, t' ≤ t_c (by def of ≤)
g. Consider an arbitrary w' s.t. ⟨w",t_c⟩≈⟨w',t_c⟩
h. by **Backward-connectedness**: ⟨w",t_c⟩≈⟨w',t_c⟩ and t'≤ t_c $\Longrightarrow$ ⟨w",t'⟩≈⟨w',t'⟩
i. by **Historicity**: ⟨w",t'⟩≈⟨w',t'⟩ and mw(w",t') $\Longrightarrow$ mw(w',t')
j. Since we know that $t_c \subseteq_{fin}$t', $\Longrightarrow$ ∃t' [$t_c \subseteq_{fin}$t' & mw(w',t') = 1]
k. $\Longrightarrow$ PRES(PERF(mw)) (w',t_c) = 1
l. Since ⟨w',t_c⟩ was arbitrary,
m. $\Longrightarrow$ ∀⟨w',t'⟩ s.t. ⟨w",t_c⟩≈⟨w',t'⟩, PRES(PERF(mw)) (w',t') = 1
n. $\Longrightarrow$ $\Box_{\approx}$ PRES(PERF(mw)) (w",t_c) (2)
o. From (1) and (2), $[\![PRES(PERF(mw))\rightarrow\ \Box_{\approx}PRES(PERF(mw))\ (w'', t_c)\ ]\!]^c = 1$ (3)
p. Now, consider an arbitrary w"' s.t. ⟨w_c, t_c⟩ $\sim^{sp}$⟨w"',t_c⟩ and the antecedent is false in c at ⟨w"',t_c⟩:
q. $[\![PRES(PERF(mw))(w''', t_c)]\!]^c = 0$
r. $\Longrightarrow$ $[\![PRES(PERF(mw))\rightarrow\ \Box_{\approx}PRES(PERF(mw))\ (w''', t_c)\ ]\!]^c = 1$ (4)
s. From (3) and (4), $[\![\Box^{sp}_{\sim}\ (PRES(PERF(mw)) \rightarrow (\Box_{\approx}PRES(PERF(mw))))\ (w_c, t_c)\ ]\!]^c = 1$
t. $\Longrightarrow$ *jodi*(A)(B) = undefined; A is unacceptable in the antecedent.

This shows that any clause whose evaluation at UT depends on the embedded VP being instantiated at an earlier time will violate the presuppositional requirement of *jodi*. Given how $\leq$ is defined, the same obtains when the truth of the clause only depends on UT, and no interval after it. This leads to parallel outcomes for the progressive and imperfective clauses, as demonstrated for a present progressive antecedent below:

(60) LF: [$_{\text{TP}}$ PRES [$_{\text{AspP}}$ PROG [$_{\text{vP}}$ mw]]]

a. $[\![PRES(PROG(mw))]\!]^c = 1$ iff

b. iff $\forall\langle$w',t$_c\rangle$ s.t. $\langle$w$_c, t_c\rangle$Inr$\langle$w',t$_c\rangle$,$\forall t' \in R^c_{t_c}, p(w', t') = 1$, where Inr is a modal base giving the set of inertial indices at $\langle$w,t$\rangle$, and R^c_t is a contextually-given regular partition on t.

c. Consider an arbitrary w" s.t. $\langle$w$_c, t_c\rangle \sim^{sp}\langle$w",t$_c\rangle$ (recall that $\sim$ is modal)

d. Suppose the antecedent is true in c at $\langle$w",t$_c\rangle$: $[\![PRES(PROG(mw))(w'', t_c)]\!]^c = 1$ (1)

e. $\Longrightarrow\forall\langle$w',t$_c\rangle$ s.t. $\langle$w",t$_c\rangle$Inr$\langle$w',t$_c\rangle$,$\forall t' \in R^c_{t_c}, p(w', t') = 1$

f. Consider an arbitrary w"' s.t. $\langle$w",t$_c\rangle\approx\langle$w"',t$_c\rangle$

g. By **Consistency of modal bases**, $\forall\langle$w',t$_c\rangle$,$\langle$w",t$_c\rangle$Inr$\langle$w',t$_c\rangle \Longleftrightarrow\langle$w"',t$_c\rangle$Inr$\langle$w',t$_c\rangle$

h. $\Longrightarrow\forall\langle$w',t$_c\rangle$ s.t. $\langle$w"',t$_c\rangle$Inr$\langle$w',t$_c\rangle$,$\forall t' \in R^c_{t_c}, p(w', t') = 1$

i. $\Longrightarrow [\![PRES(PROG(mw))(w''', t_c)]\!]^c = 1$

j. since w"' was arbitrary, $\Longrightarrow [\![\Box_{\approx}$ PRES(PROG(mw)) (w",t$_c$) $]\!]^c = 1$ (2)

k. From (1) and (2), $[\![PRES(PROG(mw))\rightarrow\ \Box_{\approx}PRES(PROG(mw))\ (w'', t_c)\ ]\!]^c = 1$ (3)

l. Now, consider an arbitrary w' s.t. $\langle$w$_c, t_c\rangle \sim^{sp}\langle$w',t$_c\rangle$ and the antecedent is false in c at $\langle$w',t$_c\rangle$:

m. $[\![PRES(PROG(mw))(w', t_c)]\!]^c = 0$

n. $\Longrightarrow [\![PRES(PROG(mw))\rightarrow\ \Box_{\approx}PRES(PROG(mw))\ (w', t_c)\ ]\!]^c = 1$ (4)

o. From (3) and (4), $[\![\Box^{sp}_{\sim}\ (PRES(PROG(mw))\ \rightarrow\ (\Box_{\approx}PRES(PROG(mw))))\ (w_c, t_c)\ ]\!]^c = 1$

p. $\Longrightarrow$ *jodi*(A)(B) = undefined; A is unacceptable in the antecedent.

5 Conclusion

In this paper, I have argued that the distribution of antecedent clauses in Bangla *jodi*-conditionals is best captured by a unified semantic constraint: the antecedent must express a proposition that the speaker presumes to be *undecided* at the evaluation time. This requirement, grounded in Kaufmann (2005)'s notion of decidedness, derives a range of otherwise disparate restrictions—on epistemic status, tense-aspect marking, and the interpretation of simple present clauses—under a single generalization. In particular, *jodi* antecedents must be both unknown to the speaker and depend for their truth value on future times in the evaluation world, distinguishing them from the broader class of antecedents licensed by English *if*, which merely require speaker ignorance.

Empirically, this proposal accounts for (i) the unacceptability of clauses whose truth is already known, (ii) the exclusion of past, perfect, and progressive marking, and (iii) the restriction of simple present clauses to future-referring interpretations, excluding habitual-generic interpretations. At the same time, it correctly predicts that these restrictions are sensitive to discourse context and the degree to which the antecedent fact is conventionalized as world knowledge.

Theoretically, these findings suggest that conditional connectives can encode invariant meaning components relating to antecedent uncertainty, supporting earlier arguments along these lines (Von Fintel and Iatridou, 2002). The contrast between *if* and *jodi* shows that such uncertainty is not uniform across languages, but instead may vary across natural language conditional connectives. An operator-based approach, under which conditional connectives in natural language straightforwardly express a conditional operator, naturally captures this variation while maintaining a unified semantics for conditionals, by taking antecedent uncertainty to be part of the presuppositional meaning component of these connectives. In contrast, a restrictor-only approach must stipulate construction-specific differences. More broadly, the results suggest that antecedent uncertainty is a locus of cross-linguistic variation in conditional meaning, and that formally encoding this parameter offers a promising path for understanding both the diversity and the unity of conditional constructions.

A particularly exciting prospect of the cross-linguistic picture is that many of the connectives discussed in section 3.2 (including *jodi*) also have counterfactual uses. This opens up a possibility to examine how the restrictions on antecedent openness might translate to constraints in the corresponding counterfactual construction. A uniform formal account for indicative and counterfactuals has been a longstanding open question in the field, and this line of inquiry promises to provide valuable empirical leverage for constraining and testing formal choices.

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