Why *if or not but /whether or not

1. Introduction. I provide an analysis for the contrast between whether and if by arguing that whether can pied-pipe its sister, but there is no pied-piping when whether is replaced by if. Strikingly, once the pied-piping parse is ruled out for whether, it behaves like if.

The puzzle. While whether and if can introduce embedded alternative questions (1), the disjunction phrase (DisjP) or not cannot immediately follow if (2), but can immediately follow whether (3) (Emonds 1985):

(1) I don’t know whether/if John will arrive this weekend or not.
   √Yes/No (Y/N) Reading: I don’t know which of the following is true: (1) John will arrive this weekend, or (2) he won’t arrive this weekend.

(2) *I don’t know if or not John will arrive this weekend.
(3) I don’t know whether or not John will arrive this weekend.

I make the novel observation that a parallel to this contrast exists for disjunction of PPs. Whether and if can introduce alternative questions involving on Saturday or on Sunday (4). The Alt(ernative) reading is lost when the DisjP immediately follows if (5), but remains when DisjP immediately follows whether (6).

(4) I don’t know whether/if John will arrive on Saturday or on Sunday.
   √Alt Reading: I don’t know which of the following is true: (1) John will arrive on Saturday, or (2) John will arrive on Sunday.

(5) I don’t know if on Saturday or on Sunday John will arrive. (*Alt)
(6) I don’t know whether on Saturday or on Sunday John will arrive. (√Alt)

Goal. I provide a unified account of the contrast between (2) and (3), and the contrast between (5) and (6).

2. Solution. Following Larson (1985), I assume that or not is a DisjP that coordinates the null positive polarity and the negative polarity not (7a). On Saturday or on Sunday is a DisjP of two PPs (7b).

(7) a. [DisjP (positive polarity) or not] b. [DisjP [on Saturday] or [on Sunday]]

Whether is a wh-phrase. It originates as the sister of the DisjP (assuming it is in Spec, DisjP, but it may be a head that projects; whether it is a head or a phrase does not matter to the analysis), and moves to Spec, CP. In (8) whether strands the DisjP behind. I will argue that whether can also pied-pipe the DisjP.

(8) a. I don’t know whether; John will arrive this weekend [DisjP t_i [Disj’ or not]].
   b. I don’t know whether; John will arrive [DisjP t_i [Disj’ on Saturday or on Sunday]].

In an if-question, there is a covert counterpart of whether (Op) that has the same derivational history as whether, i.e. origin in Spec, DisjP and movement to Spec, CP. If is C^0.

(9) a. I don’t know Op, if John will arrive this weekend [DisjP t_i [Disj’ or not]].
   b. I don’t know Op, if John will arrive [DisjP t_i [Disj’ on Saturday or on Sunday]].

Thus, to yield the Y/N reading, whether / Op must originate as the sister of or not, and move to Spec, CP. To yield the Alt reading, whether / Op must originate as the sister of the PP DisjP, and move to Spec, CP.

Proposal preview. (2) and (5) follow from the impossibility of wh-movement out of a topocalized phrase. (3) and (6) result from an additional parse unique to whether-sentences in which whether pied-pipes the DisjP. Crucially, this parse is not available for if-sentences in (2) and (5).

Analysis for (2) and (5): topocalized phrases are islands. (2) and (5) do not have the relevant readings because Op fails to move to Spec, CP from the position it would have to move from.

When the DisjP immediately follows the C^0 if, I assume that the DisjP can only be parsed as occupying a derived A-position (e.g. specifier of Topic^0):

(10) a. I don’t know Op, if [DisjP t_i [Disj’ or not]], John will arrive this weekend t_j.
   b. I don’t know Op, if [DisjP t_i [Disj’ on Saturday or on Sunday]], John will arrive t_j.
To yield an alternative question, the topicalized phrase must contain the trace of Op, as shown in (10a,b). This is unacceptable because topicalized phrases may not contain a \(wh\)-trace (Postal 1972):

(11) *I wonder [what day], John thinks that [on \(t_i\), you left.

Updating an observation by Lasnik and Saito (1992), I note an exception, i.e. topicalized nominal phrases may contain a \(wh\)-trace of a type-e element. This does not undermine the argument here because the topicalized DisjP examined in this paper is not nominal. In addition, whether and Op are likely not type e.

**Analysis for (3) and (6): whether can pied-pipe DisjP.** (3) and (6) can be interpreted as alternative questions because they have another parse under which whether as a \(wh\)-phrase pied-pipes the DisjP:

(12) a. I don’t know \([CP \{DisjP whether \{Disj’ or not\}]\), C\(^0\) John will arrive this weekend \(t_i\).
   b. I don’t know \([CP \{DisjP whether \{Disj’ on Saturday or on Sunday\}]\), C\(^0\) John will arrive \(t_i\).

In (12a), whether originates as the sister of or not and successfully moves to Spec, CP, creating the Y/N reading. (12b) has the Alt reading because whether moves from the sister of the PP DisjP to Spec, CP.

The pied-piping parse is not available for if-sentences in (2) and (5). If Op could pied-pipe, we would get different word orders from (2) and (5), namely (13a,b), which are ungrammatical:

(13) a. *I don’t know \([CP \{DisjP Op \{Disj’ or not\}]\), if John will arrive this weekend \(t_i\).
   b. *I don’t know \([CP \{DisjP Op \{Disj’ on Saturday or on Sunday\}]\), if John will arrive \(t_i\).

Examples (13a,b) are ruled out by the Doubly-Filled Comp Filter, which prohibits overt occurrence of both the head (if) and its specifier (DisjP). Thus, the presence of if requires its specifier to be covert.

**Additional reading of (4)-(6).** In addition to the Alt reading, (4)-(6) also have a Y/N reading, i.e. ‘I don’t know which is true: (1) John will arrive on a weekend day (either Saturday or Sunday), or (2) he won’t arrive on either of those days.’ Following Larson (1985), this is because the polar DisjP or not can be covert. The Y/N reading arises when whether / Op originates as the sister of this unpronounced or not.

(14) I don’t know \{whether, \(\emptyset\) / Op, if\} John will arrive on Saturday or on Sunday \(t_i\), or not).
(15) I don’t know \{whether, \(\emptyset\) / Op, if\} on Saturday or on Sunday John will arrive \(t_i\), or not).

Because whether / Op does not originate from the DisjP on Saturday or on Sunday, this DisjP can be topicalized freely, which does not affect the Y/N reading of (5) and (6):

(16) I don’t know \{whether, \(\emptyset\) / Op, if\} on Saturday or on Sunday \(t_i\), John will arrive \(t_i\) [DisjP \(t_i\), or not].

3. **Predictions: whether behaves like if without pied-piping**. Adapting a test developed by Rudin (1988), interpolation of an adverb or a parenthetical between the wh-word and the adjacent material \(X\) rules out the pied-piping parse of \(wh\)+X. Once the pied-piping parse is ruled out for whether-sentences, they are predicted to behave like if-sentences. This is borne out, as the relevant readings for whether-sentences disappear with interpolation of an adverb or a parenthetical between whether and DisjP:

(17) *I don’t know whether, \{according to Mary / actually / fortunately\}, or not John will arrive. (*Y/N)
(18) I don’t know whether, \{according to Mary / actually / fortunately\}, on Saturday or on Sunday John will arrive. (*Alt)

**Pied-piping by whether in other variants of English.** If an English variant that allows whether to pied-pipe also allows overt occurrence of both whether and C\(^0\), then we should see whether and its pied-piped sister occur before C\(^0\). This pattern is attested in Old English (19) and Singaporean English (20):

(19) Whether or not did you prepare a lease …? (20) I don’t know whether or not will John arrive.

**The contrast between (4) and (5) is sharpened in Bengali.** (5) is not completely ungrammatical due to the presence of Y/N reading. I show that this judgment is made sharper in Bengali, whose counterpart sentence to (4) lacks the Y/N reading to begin with, and only has the Alt reading. In the Bengali counterpart to (5), topicalization of the temporal DisjP leads to ungrammaticality.