Whether can pied-pipe

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Handout: bit.ly/WhetherLSA
**Whether and if appear to be interchangeable**

(1) I don’t know **whether** Pat will arrive this weekend or not.
✓ **Yes/No (Y/N) Reading**: I don’t know which of the following is true: Pat will arrive this weekend, or Pat won’t arrive this weekend.

(2) I don’t know **if** Pat will arrive this weekend or not.        (✓ Y/N)

- Are **whether** and **if** truly equivalent, syntactically and semantically?
A well-known fact: 
✓ *whether or not* but *if or not*

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

(2) I don’t know if Pat will arrive this weekend or not.  
   (✓ Y/N)

(3) I don’t know whether or not Pat will arrive this weekend.  
   (✓ Y/N)

(4) *I don’t know if or not Pat will arrive this weekend.  
   (*Y/N)

• Solution to this puzzle: *whether* and *if* have different syntactic properties
A novel observation in parallel:
✓ *whether PP but *if PP

(5) I don’t know *whether Pat will arrive on Saturday or on Sunday.
✓ Alt(ernative) Reading: I don’t know which of the following is true: (1) Pat will arrive on Saturday, or (2) Pat will arrive on Sunday.

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

(7) I don’t know *whether on Saturday or on Sunday Pat will arrive. (√Alt)

(8) I don’t know *if on Saturday or on Sunday Pat will arrive. (*Alt)
Preview of solution

• *Whether* can pied-pipe its sister
• There is no pied-piping in *if*-questions
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
• Why *if*-questions do not have the relevant reading
• Why *whether*-questions have the relevant reading: they have an additional parse where *whether* can pied-pipe
• Arguments for *whether*’s ability to pied-pipe
• Prediction: if we block the pied-piping parse of *whether*-questions, they will behave like *if*-questions
• Why the pied-piping parse is not available for *if*-questions
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
  • Why *if*-questions do not have the relevant reading
  • Why *whether*-questions have the relevant reading: they have an additional parse where *whether* can pied-pipe
• Arguments for *whether*’s ability to pied-pipe
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• Why the pied-piping parse is not available for *if*-questions
Syntax of disjunction

• Structure for or not:

(9)  
  a. $\text{DisjP (POS) or not}$
  b. I don’t know whether / if Pat will arrive this weekend $\text{DisjP (POS) or not}$.

• Structure for on Saturday or on Sunday:

(10)  
  a. $\text{DisjP [pp on Saturday] or [pp on Sunday]}$
  b. I don’t know whether / if Pat will arrive $\text{DisjP [pp on Sat] or [pp on Sun]}$. 
Syntax of *whether*-questions

(1) I don’t know *whether* Pat will arrive this weekend or not.

*Whether* originates as the sister of the DisjP (assuming it is Spec, DisjP), and then moves to Spec, CP (Larson 1985 and Han and Romero 2004)
Syntax of *whether*-questions

(5) I don’t know *whether* Pat will arrive on Saturday or on Sunday.
Syntax of *if*-questions

(2) I don’t know if Pat will arrive this weekend or not.

- A covert counterpart of *whether*, Op(erator), has the same derivational history, i.e. origination in Spec, DisjP and movement to Spec, CP
- *If* is C⁰
Syntax of *if*-questions

(6) I don’t know *if* Pat will arrive on Saturday or on Sunday.
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
• Why *if*-questions do not have the relevant reading
• Why *whether*-questions have the relevant reading: they have an additional parse where *whether* can pied-pipe
• Arguments for *whether*’s ability to pied-pipe
• Prediction: if we block the pied-piping parse of *whether*-questions, they will behave like *if*-questions
• Why the pied-piping parse is not available for *if*-questions
Two steps to generate the Y/N or Alt reading

- **Step 1**: Base-generate *whether / Op* as the sister of (polar or temporal) DisjP
- **Step 2**: Move *whether / Op* to Spec, CP
- (4) and (8) (*if or not/if* PP) fail at Step 2
- (3) and (7) (*whether or not/whether* PP) are successful
Why *if or not/if* PP fail at the movement step

- Assumption: DisjP is in a derived Ā-position (topicalized) when immediately following *if*:

\[(11) \ast I \text{ don’t know } [_{\text{CP }} \text{Op}_{i} \text{ if } [_{\text{TopP }} [_{\text{DisjP }} t_{i} [_{\text{Disj’ }} (\text{POS}) \text{ or not}]]_{j} \text{ Top}^{0} [_{\text{TP }} \text{Pat will arrive this weekend } t_{j}]]]. \]

\* Derivation for “*if or not*”

\[(12) \ast I \text{ don’t know } [_{\text{CP }} \text{Op}_{i} \text{ if } [_{\text{TopP }} [_{\text{DisjP }} t_{i} [_{\text{Disj’ }} \text{ on Saturday or on Sunday}]]_{j} \text{ Top}^{0} [_{\text{TP }} \text{Pat will arrive } t_{j}]]]. \]

\* Derivation for “*if PP*”

- The topicalized DisjP contains a *wh*-trace
Why *if or not/if* PP fail at the movement step

- A topicalized phrase cannot contain a *wh*-trace
- “Movement out of moved elements” is banned in English:

(13) a. *I wonder whom*$_j$ [to $t_j$]$_i$ you talked $t_i$.
    b. *I wonder [what day]$_j$ Pat thinks that [on $t_j$]$_i$ you left $t_i$.
    c. *I wonder [whose book]$_j$ Kim claims that [about $t_j$]$_i$ you talked $t_i$. 
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
• Why *if*-questions do not have the relevant reading
• Why *whether*-questions have the relevant reading
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Why *whether or not/whether* PP is fine

- The same ban should rule out *whether or not/whether* PP as well
- Another parse is available where *whether* pied-pipes the DisjP:

(14)  

a. I don’t know [\textit{CP} [\textit{DisjP whether [\textit{Disj′ (POS) or not}]]}_i \textit{C}^0

\[\text{[\textit{TP} Pat will arrive this weekend t}_i]]\]  \textit{Another parse for “whether or not”}

b. I don’t know [\textit{CP} [\textit{DisjP whether [\textit{Disj′ on Saturday or on Sunday}]]}_i \textit{C}^0

\[\text{[\textit{TP} Pat will arrive t}_i]]\]  \textit{Another parse for “whether PP”}

- √ **Step 1**: Base-generate *whether* as the sister of DisjP
- √ **Step 2**: Move *whether* to Spec, CP
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
• Why *if*-questions do not have the relevant reading
• Why *whether*-questions have the relevant reading: they have an additional parse where *whether* can pied-pipe

• Arguments for *whether’s* ability to pied-pipe
  • Sluicing
  • English dialects
  • *Wh*-morphology

• Prediction: if we block the pied-piping parse of *whether*-questions, they will behave like *if*-questions
• Why the pied-piping parse is not available for *if*-questions
Evidence for whether’s ability to pied-pipe

• Sluicing – the material that can survive sluicing is Spec, CP:
(15) a. Pat talked to someone, but I don’t know to whom he talked.
    b. Pat left on some day, but I don’t know on which day he left.

• Whether + DisjP may survive sluicing => the DisjP must have been pied-piped by whether
(16) I know that Pat will arrive sometime on the weekend. I’m just not sure whether on Saturday or on Sunday he will arrive.
Evidence for *whether*'s ability to pied-pipe

• In modern legal English, overt *whether* can cooccur with auxiliary inversion (e.g. “*Whether* did Pat leave or not?”)

• Material to the left of C⁰ is in Spec, CP

• *Whether + DisjP* can appear to the left of the auxiliary in C⁰:

  (17) *Whether or not did* you prepare a lease, pursuant and conformable to such instructions?

  (18) a. *Whether or not did* such action come on to be tried?

     b. *Whether or not were* the judge desirous to find a special verdict...

  (19) I will ask you *whether or not did* the defendant make any voluntary statement to you after he was placed under arrest?

  (legal documents from the 19th and 20th centuries)
Evidence for *whether’s* ability to pied-pipe

• **Whether + DisjP** together can be coordinated with other *wh*-elements that occupy Spec, CP

(20) And if yea, for what purpose, and when and by whom and **whether or not was** such counterpart, left with the said complainant?

(legal documents from the 19th century)
Evidence for *whether*'s ability to pied-pipe

- *Whether* is a *wh*-word, as it has *wh*-morphology (Emonds (1976) a.o.)
- Since *wh*-words can pied-pipe in general in English, *whether* should also be able to pied-pipe
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
• Why *if*-questions do not have the relevant reading
• Why *whether*-questions have the relevant reading: they have an additional parse where *whether* can pied-pipe
• Arguments for *whether*’s ability to pied-pipe
• Prediction
• Why the pied-piping parse is not available for *if*-questions
Prediction of this analysis

• Analysis:
  • *If or not / If* PP are ruled out by the ban on a topicalized phrase that contains a *wh*-trace
  • *Whether or not / Whether* PP are grammatical because they have an additional parse where *whether* pied-pipes the DisjP

• Prediction: if we can block the pied-piping parse of a *whether*-question, it should behave like an *if*-question

• Plan:
  • Show how to block the pied-piping parse
  • Show that this prediction is borne out
Blocking the pied-piping parse

• The pied-piping parse can be blocked by interpolation of an adverb or a parenthetical between the wh-word (pied-piper) and the pied-pipee (Rudin 1988)

(21) a. *I wonder to, according to Kim, whom you talked.
   b. *I wonder to, actually, whom you talked.
   c. *I wonder to, fortunately, whom you talked.
The prediction is borne out

• Interpolation between *whether* and the DisjP makes the *whether*-sentences *if*-like

• *Whether or not* becomes ungrammatical

(22)  a. *I don’t know whether, according to Kim, or not Pat will arrive this weekend.

b. *I don’t know whether, actually, or not Pat will arrive this weekend.

c. *I don’t know whether, fortunately, or not Pat will arrive this weekend.*
The prediction is borne out

• Interpolation between *whether* and the DisjP makes the *whether*-sentences *if*-like

• *Whether* PP does not have the Alt reading

(23) a. I don’t know whether, according to Kim, on Saturday or on Sunday Pat will arrive. (*Alt)
b. I don’t know whether, actually, on Saturday or on Sunday Pat will arrive. (*Alt)
c. I don’t know whether, fortunately, on Saturday or on Sunday Pat will arrive. (*Alt)
Roadmap

• Assumed syntactic structures of *whether*- and *if*-questions
• Why *if*-questions do not have the relevant reading
• Why *whether*-questions have the relevant reading: they have an additional parse where *whether* can pied-pipe
• Arguments for *whether*’s ability to pied-pipe
• Prediction: if we block the pied-piping parse of *whether*-questions, they will behave like *if*-questions
• Why the pied-piping parse is not available for *if*-questions
Can Op pied-pipe like *whether*?

- Recall: *whether*-sentences allow the relevant readings because of a parse in which *whether* pied-pipes DisjP
- If Op can pied-pipe, it wouldn’t generate the *if or not / if* PP word order
- The word order it would generate is *or not if / PP if*, which is also ungrammatical

(24)  
  a. *I don’t know [\text{DisjP Op \text{Disj’} (POS or not)}]_i if Pat will arrive this weekend \text{t}_i.
  
  b. *I don’t know [\text{DisjP Op \text{Disj’} on Saturday or on Sunday}]_i if Pat will arrive \text{t}_i.
Why can’t Op pied-pipe like *whether*?

• Two possible reasons
  • Doubly-Filled Comp Filter prohibits overt co-occurrence of the head (*if*) and its specifier (DisjP)
  • Phonologically null elements cannot pied-pipe overt material
Summary

• Novel observation parallel to √ *whether or not* but *if or not:
  √ *whether PP* but *if PP*

• Two possible parses when the DisjP is fronted:
  • DisjP is topicalized => traps *wh*-subextraction => relevant reading is unavailable
  • DisjP is pied-piped => relevant reading is available

<table>
<thead>
<tr>
<th>Parse of fronted DisjP</th>
<th><em>if</em>-questions</th>
<th><em>whether</em>-questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>if or not</td>
<td>if PP</td>
</tr>
<tr>
<td>Topicalization</td>
<td>✓</td>
<td>✓</td>
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<tr>
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<td>x</td>
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Thank you!

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Appendix A: Polish

- Polish has *whether*, which can pied-pipe
- Polish offers something English does not have: multiple lexical items for ‘or’
- ‘Whether’ agrees with ‘or’ => pied-piping effects in English and Polish
Appendix A: Polish

- Polish has *whether*, which can pied-pipe
- Polish offers something English does not have: multiple lexical items for ’or’
- ’Whether’ agrees with ‘or’ => pied-piping effects in English and Polish
Polish has ‘whether’

• Neutral word order for an embedded alternative question:

(25) Nie wiem czy Jan przyjedzie w sobotę
     Not know.1sg whether Jan arrive.perf.3sg in Saturday
     czy w niedzielę.
     or1 in Sunday

Literal Meaning: ‘I don’t know whether Jan will arrive on Saturday or on Sunday.’

✓ Alt Reading: I don’t know which of the following is true: (1) Jan will arrive on Saturday, or (2) Jan will arrive on Sunday.

*Y/N Reading: Which of the following is true: (1) Jan will arrive on a weekend day, or (2) Jan won’t arrive on a weekend day?
Polish has ‘whether’

• When the temporal DisjP immediately follows czy ‘whether’, the Alt reading remains:

(26) Nie wiem czy w sobotę czy w niedzielę
not know.1sg whether in Saturday or1 in Sunday

Jan przyjedzie.
Jan arrive.perf.3sg

(✓ Alt)

• Czy ‘whether’ = English whether

• (26) can be analyzed as pied-piping of the DisjP by czy ‘whether’
Arguments for czy’s ability to pied-pipe

• Argument from sluicing applies to Polish: czy w sobotę czy w niedzielę
  ‘whether on Saturday or on Sunday’ can survive sluicing:

(27) ...Nie jestem tylko pewna czy w sobotę
  ... not be.PRES.SG.FEM only sure whether in Saturday
  czy w niedzielę.
  or1 in Sunday

  ‘...I’m just not sure whether on Saturday or on Sunday’, as continuation to
  “I know that Jan will arrive sometime on the weekend...”

• Czy ‘whether’ has wh-morphology (Wiland 2017), and wh-phrases can pied-pipe in general in Polish
Appendix A: Roadmap

• Polish has *whether*, which can pied-pipe
• Polish has multiple lexical items for ’or’
• ‘Whether’ agrees with ‘or’ => pied-piping effects in English and Polish
Two ‘or’s in Polish

• Recall: (25) does not have the Y/N reading

(25) Nie wiem czy Jan przyjedzie w sobotę
Not know.1sg whether Jan arrive.perf.3sg in Saturday

czy w niedzielę.
or1 in Sunday

(✓ Alt; *Y/N)

• To get the Y/N reading, czy ‘or1’ must be replaced by *albo ‘or2’:

(28) Nie wiem czy Jan przyjedzie w sobotę
Not know.1sg whether Jan arrive.perf.3sg in Saturday

albo w niedzielę.
or2 in Sunday

(*Alt; ✓Y/N)
Morphological identity

• Identical form of czy ‘whether’ and czy ‘or1’
• Identical form of albo ‘either’ (the [-WH] counterpart to ‘whether’) and albo ‘or2’:

(29) **Albo** Jan przyjedzie w sobotę **albo** przyjedzie w niedzielę.
    Either Jan will.arrive on Saturday or2 will.arrive on Sunday
    ‘Either Jan will arrive on Saturday or he will arrive on Sunday.’

• Identical form of ani ‘neither’ (the [+NEG] counterpart to ‘either’) and ani ‘nor’
Appendix A: Roadmap

• Polish has *whether*, which can pied-pipe
• Polish offers something English does not have: multiple lexical items for ’or’
• ‘Whether’ agrees with ‘or’
  • Morphological identity reflects agreement
  • English also has this agreement
  • Pied-piping is a result of feature sharing
  • A prediction
Morphological identity reflects agreement

• Morphological identity is a reflex of agreement between ‘whether’ and ‘or1’, ‘either’ and ‘or2’, and ‘neither’ and ‘nor’
• When ‘whether’ originates as the sister of a DisjP, it agrees with ‘or’, and copies its morphological feature to ‘or’ under agreement
• ‘Either’ agrees with ‘or2’; ‘neither’ agrees with ‘nor’
• ‘Or’ surfaces as
  • czy ‘or1’ if and only if it has been local to czy ‘whether’
  • albo ‘or2’ under locality to albo ‘either’
  • ani ‘nor’ under locality to ani ‘neither’

(30)  
  a. \[
  [_{CP} \text{czy}_i \ldots [_{orP} \text{czy}_i [_{or'} A \text{czy} B]]]
  \]
  b. *
  \[
  [_{CP} \text{czy}_i \ldots [_{orP} \text{czy}_i [_{or'} A \text{albo} B]]]
  \]
Complementary distribution of the two ‘or’s

• Czy ‘whether’ must have been the sister of the temporal DisjP formed by czy ‘or1’, so (25) has the Alt reading

(25) Nie wiem czy Jan przyjedzie w sobotę
Not know.1sg whether Jan arrive.perf.3sg in Saturday

czy w niedzielę.
ory in Sunday

(✓ Alt; *Y/N)

• Czy ‘whether’ cannot have been the sister of the DisjP formed by albo ‘or2’, so (28) does not have the Alt reading

(28) Nie wiem czy Jan przyjedzie w sobotę
Not know.1sg whether Jan arrive.perf.3sg in Saturday

albo w niedzielę.
ory in Sunday

(*Alt; ✓ Y/N)
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• Polish has *whether*, which can pied-pipe
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  • Pied-piping is a result of feature spreading
  • A prediction
This agreement also exists in English

• Neither (the [+NEG] counterpart of either) shares its negative morphology with nor (e.g. Hendriks 2004; den Dikken 2006)
• Similar to whether, neither originates as the sister of a DisjP and may move up later, triggering auxiliary inversion
• Negative morphology on nor is a reflex of agreement between neither and nor when neither is local to nor

(31) a. \([_{\text{CP}} \text{neither}_i \ldots \text{orP } \text{neither}_i [\text{or}_r \text{ A nor B}]]\]
   b. \(*[_{\text{CP}} \text{neither}_i \ldots \text{orP } \text{neither}_i [\text{or}_r \text{ A or B}]]\)
This agreement also exists in English

• Suppose English *whether* also agrees with *or* (despite no overt shared morphology)
• ‘Whether’/‘neither’/‘either’ agrees with ‘or’ in English and Polish
Appendix A: Roadmap

• Polish has *whether*, which can pied-pipe
• Polish offers something English does not have: multiple lexical items for ’or’
• ’Whether’ agrees with ‘or’
  • Morphological identity reflects agreement
  • English also has this agreement
• Pied-piping is a result of feature spreading
• A prediction
Pied-piping is a result of feature spreading

- Polish czy ‘whether’ agrees with ‘or’ => it spreads its [+WH] feature to ‘or’ => [+WH] ‘or’ then projects the [+WH] feature to the entire DisjP
- Interrogative C probes for the [+WH]
- The entire DisjP and its specifier ‘whether’ are both eligible goals and equidistant to the C probe because of the [+WH] feature on them (Pesetsky and Torrego 2001)
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• Polish has *whether*, which can pied-pipe
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• ’Whether’ agrees with ‘or’
  • Morphological identity reflects agreement
  • English also has this agreement
  • Pied-piping is a result of feature spreading
• A prediction: English *neither* should be able to pied-pipe
Prediction: English *neither* can also pied-pipe

• *Neither* agrees with *nor* => it spreads its [+NEG] feature to *nor* => *nor* projects its [+NEG] feature to the entire DisjP => the entire DisjP and *neither* are equidistant to the probe for [+NEG]

(32) There will be terrible weather all this weekend, therefore...
... [neither]₁ will Pat arrive t₁ on Saturday nor on Sunday. *No pied-piping*
... [neither on Saturday nor on Sunday]₁ will Pat arrive t₁. *Pied-piping*
Appendix B: Additional reading with PP DisjP

• When the DisjP coordinates temporal PPs, there is always a Y/N reading present:

(5) I don’t know **whether** Pat will arrive on Saturday or on Sunday.
✓ **Y/N reading:** I don’t know which of the following is true: (1) Pat will arrive on a weekend day (either Saturday or Sunday), or (2) Pat won’t arrive on either of those days.’

(6) I don’t know **if** Pat will arrive on Saturday or on Sunday.  
✓ **Y/N**

(7) I don’t know **whether** on Saturday or on Sunday Pat will arrive.  
✓ **Y/N**

(8) I don’t know **if** on Saturday or on Sunday Pat will arrive.  
✓ **Y/N**
Why is the additional reading available?

• Two types of questions with different question operators: $Q_{\text{Alt}}$ and $Q_{\text{yes/no}}$
  (Hamblin (1973), Karttunen (1977) and Biezma (2009))
  • $\llbracket Q_{\text{Alt}} \rrbracket = \lambda p. \lambda q. p = q$ (present in (1)-(4) and the Alt reading of (5)-(8))
  • $\llbracket Q_{\text{yes/no}} \rrbracket = \lambda p. \lambda q. [q = p \lor q = \neg p]$ (present in the Y/N reading of (5)-(8))

• (7)-(8) involves topicalization of the temporal DisjP inside a simple proposition, which should not affect its semantic composition with $Q_{\text{yes/no}}$
Appendix C: Not everyone accepts the Alt reading of (7)

• Out of 8 native speakers:
  • 6 agreed that (8) is worse than (7), though 3 people found (7) a bit awkward to begin with
  • 2 found (7) so awkward that it just sounds bad, and reported (8) to also be ungrammatical
  • No one who accepted (7) also accepted (8)

• Grammar of those 2 speakers who rejected both (7) and (8), and yet agreed with the contrast between (3) and (4):
  • Whether can pied-pipe certain elements (e.g. the polar disjunction or not), but not others (e.g. the temporal disjunction on Saturday or on Sunday)
Appendix C: Not everyone accepts the Alt reading of (7)

- Wh-phrases can’t pied-pipe every type of element in English
  - E.g., a wh-object can pied-pipe its sister if the sister is a preposition, but not if it is a verb
  - There is dialectal variation in what material can be pied-piped by other wh-phrases
  - E.g., massive pied-piping in relative clauses was reported to be ungrammatical by Heck (2009), by fine by Ross (1986):

(33) *a man [DP a deck chair of whom]₁ you spilled coffee on t₁
References


References


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