<div align="center">Indirect dependency to weak islands and more</div>

Keywords: factive and *wh* islands, intervention effects, pair-list readings, *wh*-scope marking

[Introduction] What has been learned from the indirect dependency approach (e.g. Dayal 1994, Horvath 1997 among others) to *wh*-scope marking constructions such as (1) is that an expletive *wh*-phrase is raised to simply check the formal feature of C^0 (i.e. syntactic licensing) and the embedded (interrogative) clause is interpreted in the position of the expletive *wh*-phrase. Consider the following Hungarian example of *wh*-scope marking:

(1) Mit   godolsz, hogy kit   látott János?   (Hungarian)
    what.Acc think.2sg that who.Acc saw.3g John.Nom 'Who do you think that John saw?''

For example, the restriction of the *wh*-operator is not 'thing(x)' of *mit* but what (*hogy*) *kit látott János* describes, i.e. '$\exists x[person_w(x) \wedge p' = \lambda w'(saw_{w'}(j,x))]$'. This presentation will show that such indirect approach is more widely employed than previously thought.

More specifically, weak islands such as factive and *wh* islands (but not negative islands) arise due to application of indirect dependency. Examine the following examples of weak islands:

(2) a. ? Who$_i$ did you learn [that John had spoken to t_i]?
    b. * Why$_i$ did you learn [that John had quit smoking t_i]?

(3) a. ? Who$_i$ did you wonder [whether John had spoken to t_i]?
    b. * Why$_i$ did you wonder [whether John had quit smoking t_i]?

A few semantic accounts have been made to explain the contrast, some of which this presentation too assumes as shown later, but, as far as we know, no successful syntactic account has been presented to explain why weak islands cause ungrammaticality.

[Account] Following Dayal (1996) and Lahiri (2002), a covert operator selects the embedded clause and is (covertly) raised to the position of the *wh*-expletive expression, i.e. *mit* in (1). Moreover, we assume that a *wh*-phrase (*in situ*) (e.g. *kit* in (1)) is inherently focused and represents a set of alternatives (Rooth 1985). As a result of pointwise functional application, the embedded clause represents a set of propositions, which serves as the restrictor as already argued. We call this a domain widening mechanism in this presentation.

According to Kotek (2014), the widening mechanism is employed to overcome islands such as a case in which an *in-situ wh*-phrase is inside an adverbial clause (in the case of multiple-*wh* questions in English and German). The fact that *wh*-phrases such as 'why' and 'how' cannot be saved in such environment (the observation of which is attributed to Huang (1982)) indicates that the mechanism is limited to types of *wh* expressions which range over individuals, such as 'who', 'what', 'where' and 'when'.

Based on the assumptions above, we claim that (2)*a*, a factive island case, is syntactically represented (using the copy theory) as follows:

(4) Who$_i$ did you learn OP$_i$-[that John had spoken to *who$_i$*]?

In (4), the overtly raised copy of *who* is a *wh*-expletive and only checks the formal feature of the matrix C and has no or little semantics in and of itself. Instead, the copy in the base position is semantically active and initiates the domain widening mechanism. The (stronger) ungrammaticality of (2)*b* is naturally accounted for because the mechanism is not applicable to 'why'. Similarly, we can explain (3), the contrast in *wh*-islands. The only difference is that the restrictor of the *wh*-operator represents not a set of propositions but of (Yes/No) questions. Mild ungrammaticality of (2)*a* and (3)*a* is due to use of a contentful *wh* expression as a *wh*-expletive.

What this analysis predicts is that *who* in (2) and (3) is subject to intervention effects, which is borne out as follows (interveners are underlined):

(5) a. * Who$_i$ did you learn [that John had <u>not</u> spoken to t_i]?
    b. * Who$_i$ did you learn [that <u>only</u> John had spoken to t_i]?

(6) a. * Who$_i$ did you wonder [whether John had <u>not</u> spoken to t_i]?
    b. * Who$_i$ did you wonder [whether <u>only</u> John had spoken to t_i]?

According to Beck (2006) and Kotek (2014), an intervention effect arises when the widening process for an in-situ *wh* expression is blocked by a c-commanding intervener, but the new data above show that an intervention effect may occur even when *wh* expressions are not c-commanded by interveners. However, intervention effects in (5) and (6) are expected of the present account because the lower copy of *who*, i.e. the one with semantic content, goes through the domain widening mechanism.

[Consequences] Japanese is a *wh*-in-situ language and subject to *wh*-islands (and factive islands such as (2), examples of which are omitted due to lack of space), but Takashi (1993) has shown that overt extraction (or scrambling) of a *wh* expression overcomes a *wh*-island as follows:

(7) a. [$_{CP}$ John-wa [$_{CP}$ Mary-ga   nani-o   tabeta ka] siritagatteiru no]?
         John-Top   Mary-Nom what-Acc   ate   Q   wants.to.know Q
       'Does John want to know what Mary ate?' **No matrix scope reading for *nani* 'what'**

   b. [$_{CP}$ Nani-o$_i$ John-wa [$_{CP}$ Mary-ga t_i tabeta ka] siritagatteiru no]?
         what-Acc John-Top   Mary-Nom   ate   Q   wants.to.know Q
       'What does John want to know whether Mary ate?' Takahashi (1993: 657, adapted)

This data is important because overt movement of a *wh*-phrase out of an embedded interrogative clause can syntactically license the matrix clause as a *wh*-question. However, what remains unnoticed is that such a case is subject to intervention effects as follows:

(8) *[$_{CP}$ Nani-o$_i$ John-wa [$_{CP}$ {dareka/Ken ka Mary}-ga t_i tabeta ka] siritagatteiru no]?
         what-Acc John-Top   {someone/Ken or Mary}-Nom   ate   Q wants.to.know Q
     'What does John want to know whether {someone/Ken or Mary} ate?'

Nani 'what' in (8) is simply an expletive, i.e., a syntactic licensor, and the real restriction of the *wh* operator (i.e. the real semantics) is formed by raising the whole embedded clause (covertly) to the matrix CP. Thus, (7) is another example of indirect dependency to overcome *wh*-islands.

The discussion above has shown that a contentful *wh* expression can initiate indirect dependency, in the case of which the higher copy functions as an expletive *wh* expression while the lower copy contributes to formation of the restrictor. Therefore, syntactic and semantic features can be distributed over different copies.

Another piece of advantage for the present approach is that it can explain pair-list readings in *wh*-scope marking constructions as follows:

(9) What does John think? Who bought what?

In the literature there are two types of approach to derive pair-list readings: functional (e.g. Dayal 1996) and higher order question (e.g. Hagstrom 1998, Fox 2012) approaches, but neither of them is satisfactory. The former has to stipulate a very complex functional C^0. In contrast, the higher order question account faces a selection problem: if 'who bought what' represents a family of questions as Hagstrom and Fox claim, 'think' is expected to select a question, which results in selection mismatch, because it must select a proposition. The present approach does not need a function operator or face a selection issue: multiple application of indirect dependency solves the problem.

[References] Beck (2006) "Intervention Effects Follow from Focus Interpretation," *Natural Language Semantics* 14, 1-56; **Dayal** (1994). "Scope Marking as Indirect Wh-Dependency," *NLS* 2, 137-170; **Dayal** (1996). *Locality in WH Quantification: Questions and Relative Clauses in Hindi*, Kluwer, Dordrecht; **Hagstrom** (1998). *Decomposing Questions*, doctoral dissertation, MIT; **Horvath** (1997). "The Status of 'Wh-Expletives' and the Partial Wh-Movement Construction of Hungarian," *NLLT* 15, 509-572; **Huang** (1982) *Logical relations in Chinese and the theory of grammar*, doctoral dissertation, MIT; **Kotek** (2014) *Composing Questions*, doctoral dissertation, MIT; **Lahiri** (2002). "On the proper treatment of 'expletive wh' in Hindi," *Lingua* 112(7), 501-540; **Rooth** (1985) *Association with focus interpretation*, doctoral dissertation, U. of Massachusetts; **Takahashi** (1993) "Movement of WH-Phrases in Japanese," *NLLT* 11(4), 655-678.