***Wh*-quantification in Alternative Semantics**

Many languages form quantifiers by combining a *wh*-phrase with an additional morpheme. I present a framework for *wh*-quantification (***Wh*Q**) within a Roothian two-dimensional Alternative Semantics, which productively explains the prevalence of scalar focus particles and disjunctors in *Wh*Q (as noted by Haspelmath 1997). This work builds on existing descriptions of *Wh*Q as in Japanese (Kratzer and Shimoyama, 2002) and Tiwa (Tibeto-Burman; Dawson 2018), but also contributes original data from Toba Batak (Austronesian), Tibetan, and Burmese.

Two key notions: Interpretability and Reset Following Rooth 1985, 1992, the denotation of any expression will have two parts: an ordinary denotation (o) and a set of alternatives (alt). I propose that CPs must satisfy (1). (See similar intuitions in Rooth 1992 and Beck 2006.)

(1) Interpretability: To interpret α, $[\![\alpha]\!]^{o}$ must be defined and $\in [\![\alpha]\!]^{alt}$.

In Rooth's system, if α does not contain focus, $[\![\alpha]\!]^{alt} = \{[\![\alpha]\!]^{o}\}$. Some operators ensure this:

(2) Reset: An operator *Op* is "resetting" if it lexically specifies $[\![Op\ \alpha]\!]^{alt} := \{[\![Op\ \alpha]\!]^{o}\}$.

The ingredients: *wh*, J, AltShift, ∃ Four families of lexical items found in existing literature will together derive a range of interpretations. A *wh*-phrase (3) has the Hamblin denotation as its alternative set (here over a, b, c) but no defined ordinary value (Ramchand, 1997; Beck, 2006). The head J (4) (Den Dikken, 2006, a.o.) takes two (or more) juncts, taking the set of their ordinary values to be its alternative set, with no defined ordinary value, similar to *wh*.

(3) $[\![wh]\!]^{o}$ undefined
$[\![wh]\!]^{alt} = \{a, b, c\}$

(4) $[\![[a\ J\ b]]\!]^{o}$ undefined
$[\![[a\ J\ b]]\!]^{alt} = \{a, b\}$

(5) $[\![[\text{AltShift}\ \alpha]]\!]^{o} = [\![\alpha]\!]^{alt}$
$[\![[\text{AltShift}\ \alpha]]\!]^{alt} = \left\{[\![\alpha]\!]^{alt}\right\}$

Clauses containing a *wh*-phrase or J-disjunction will have a denotation with no ordinary value but with a non-trivial alternative set. AltShift (5) (Kotek, 2016; C_{int} in Beck, 2006) shifts such structures' alternative set denotations into a Hamblin set denotation in the ordinary dimension. Notice that AltShift is resetting (2), resulting in Interpretable (1) question meanings.

I adapt ∃ from Kratzer and Shimoyama 2002 and Alonso-Ovalle 2006, written in a one-dimensional Hamblin semantics, into a family of ∃ operators. Consider ∃ (6) and $\exists_{reset}$ (7). ∃ passes up its sister's alternative set, untouched, whereas $\exists_{reset}$ is resetting. Following previous works, $\exists_{reset}$ applies to phrases containing J-disjunction to form logical (boolean) disjunction.

(6) $[\![\exists\ \alpha]\!]^{o} = \bigvee [\![\alpha]\!]^{alt}$
$[\![\exists\ \alpha]\!]^{alt} = [\![\alpha]\!]^{alt}$

(7) $[\![\exists_{reset}\ \alpha]\!]^{o} = \bigvee [\![\alpha]\!]^{alt}$
$[\![\exists_{reset}\ \alpha]\!]^{alt} = \left\{\bigvee [\![\alpha]\!]^{alt}\right\}$

Deriving *wh*(-disj) indefinites: In many languages, the combination of a *wh*-phrase with a disjunctor forms an indefinite. I propose that, in these languages, the surface realization of the disjunctor can correspond to the use of J or $\exists_{reset}$ alone. $\exists_{reset}$ applied to a *wh*-containing phrase results in an indefinite which satisfies Interpretability (1). (Languages can also have a null $\exists_{reset}$, possibly with a limited syntactic distribution, resulting in bare *wh*-indefinites.)

Evidence for the shared use of an ∃ operator in disjunction and *wh*-disj indefinites comes from Tiwa (Tibeto-Burman). Tiwa has two disjunctors and corresponding series of *wh*-disj indefinites, which match in their scope-taking possibilities: *khi* disjunction and *wh-khi* indefinites take obligatory widest scope, whereas *ba* disjunction and *wh-pha* indefinites take narrower scope (Dawson, 2018, to appear). I propose that *khi* and *ba/pha* realize two different versions of $\exists_{reset}$ which syntactically differ in their scope-taking abilities.

Deriving *wh*-disj NPIs: In languages such as Toba Batak and West Greenlandic (Sadock, 2003), *wh*-disj forms NPIs. I propose that the disjunctor here realizes ∃, rather than $\exists_{reset}$.

(8) Toba Batak: *ise* = 'who' *manang ise* DISJ=who = 'anyone' (NPI)

An example of ∃ applied to a *wh*-containing phrase is shown in (9). Notice that (9) does not satisfy Interpretability (1) and will lead to ungrammaticality, with or without a higher negation.

(9) $[\![[\exists\ [\text{who came}]]]\!]^{o} = {}^{\wedge}\exists x\ .\ x \text{ came}$; $[\![[\exists\ [\text{who came}]]]\!]^{alt} = \{{}^{\wedge}\text{a came}, {}^{\wedge}\text{b came}, {}^{\wedge}\text{c came}\}$

The use of ∃ + *wh* therefore requires a higher operator which will revise the alternative set to be Interpretable. The use of overt or covert EVEN is one such option, assuming that focus particles are resetting (2), as assumed in e.g. Beck 2006. Following Lahiri 1998 and others, association of EVEN with an indefinite leads to an unsatisfiable presupposition in (10), leading to ungrammaticality. The same association across a downward-entailing operator as in (11) will lead to a satisfiable (in fact, tautological) presupposition.

(10) [EVEN [∃ [who came]]] $\rightsquigarrow$ ($^{\wedge}$someone came) $<_{\text{likely}}$ ($^{\wedge}$a came) ... unsatisfiable

(11) [EVEN [NEG [∃ [who came]]]] $\rightsquigarrow$ ($^{\wedge}$no one came) $<_{\text{likely}}$ ($^{\wedge}$a didn't come) ... satisfiable

In Toba Batak, *pe* EVEN can cooccur with these NPIs (12), supporting the view that overt or covert EVEN is involved in the grammatical use of *wh*-DISJ NPIs.

(12) Dang ro [manang ise (pe)].
NEG come DISJ who EVEN
'No one came.'

Deriving *wh*-EVEN NPIs: In languages such as Tibetan and Japanese, bare *wh*-words cannot be indefinites, but *wh* + EVEN is an NPI (13). In contrast to Toba Batak and West Greenlandic, Tibetan and Japanese have a covert ∃ but lack covert EVEN. There is no covert $\exists_{\text{reset}}$.

(13) Tibetan: *su* = 'who' (≠ 'someone') *su-ye* who-EVEN = 'anyone' (NPI)

As above, covert ∃ applying to *wh* leads to a meaning which violates Interpretability (as in (9)), explaining the unavailability of bare *wh*-indefinites. Applying EVEN forms an NPI.

Deriving *wh*-ONLY free choice items: In Burmese, *wh* + ONLY forms free choice (FC) items:

(14) Burmese: *bar* = 'who/what' (≠ 'some...') *bal-bal* who-ONLY = 'anyone/anything' (FC)

This use of ONLY is explained by — and in turn supports — the exhaustification approach to FC (Fox, 2007). The technical implementation for FC items as in (14) in this framework will be presented at the talk, but parallels the formation of NPIs with EVEN, above.

Interpretability and Vacuity: Crnič's (2011) proposes that the use of a focus particle is ungrammatical when its addition does not contribute to interpretation (Non-Vacuity). Note that, when EVEN applies to form an NPI as in (10–11), the semantic contribution of EVEN in the grammatical (11) is a tautology. I propose that the addition of EVEN here is grammatical because it repairs a violation of Interpretability, thereby reconciling Crnič's Non-Vacuity condition with theories of NPI and FC licensing which involve EVEN and ONLY particles (Lahiri, Chierchia, ...).

Summary: The approach to *Wh*Q presented here — developed in Alternative Semantics and driven by Interpretability — has the benefit of explaining the cross-linguistic prevalence of scalar focus particles and disjunctors in *Wh*Q, previously noted by Haspelmath (1997), as well as the previously undescribed use of ONLY in the formation of free chioce items in Burmese. This is unpredicted by recent works such as Szabolcsi 2015 and Uegaki 2018, which account for an overlapping range of phenomena. The talk also contributes data from original fieldwork on *Wh*Q in Toba Batak, Tibetan, and Burmese. Time permitting, in the talk, I will also discuss extensions of the framework to *wh*-universals as in Japanese.

Selected references Alonso-Ovalle 2006 *Disjunction in alternative semantics*, UMass PhD • Beck 2006 "Intervention effects follow from focus interpretation," *NaLS* • Dawson t.a. "Tiwa indeterminates and NP restriction in a Hamblin semantics," FASAL 7 • Haspelmath 1997 *Indefinite pronouns* • Kratzer & Shimoyama 2002 "Indeterminate pronouns: the view from Japanese," TCP • Lahiri 1998 "Focus and negative polarity in Hindi," *NaLS*