Session VI – The interpretation of complex wh-DISJ expressions

1. The phenomenon

- In many languages, complex quantifying expressions can be formed by combining wh-elements and conjunctive (‘and’) or disjunctive (‘or’) elements:

- In Hausa, wh-expressions combine with the prefix koo ‘or’ in order to form a complex quantifying expression koo+wh (e.g. Newman 2000). Q-formation applies to D-quantifiers (1a-c) and A-quantifiers alike (1d-f).

(1) a. koo-waa = koo + who ‘everyone’
b. koo-mee = koo + what ‘everything’
c. koo-wànè = koo + which ‘every’,
d. koo-‘inna = koo + where ‘everywhere’
e. koo-yàushee = koo + when ‘always’
f. koo(ta)yàayàa = koo + yàayàa ‘in every way’

- Koo is the disjunction marker (cf. 2), and doubles as an (optional) Y/N-question marker (3) (see also Jayaseelan 2001 on such doubling in other languages).

(2) zà-i daawoo nän dà awàa biyu koo zài bugàa manà wayàà. FUT-3sg return here in hour two DISJ FUT-3sg hit us wire ‘He will return within two hours or he will call us.’ (Newman 2000:132)

(3) koo kaa såami gyàd’aa mài yawàà? (Cowan & Schuh 1976:216) DISJ/Q 2sg.m.PERF get peanut many ‘Did you get a lot of peanuts?’

- Wh-DISJ-quantifier formation is attested in many other languages, both typologically related and unrelated: other Chadic languages (Margi (Hoffmann 1963), Mupun (Frajzyngier 1993), Hdi (Frajzyngier 2002), Gùrùntù m (Haruna 2003)), Japanese (Nishigauchi 1986, 1990), Malayalam (Jayaseelan 2001), Kannada (Amritavalli 2003), Korean (Haspelmath 1997, Gill 2004).

- Japanese, Malayalam, and Korean also allow for the formation of wh-CONJ-quantifiers.

2. Variation in the interpretation of wh-DISJ quantifiers


i. Hausa, Korean: wh+DISJ = ∀ , cf. (1), (4)

(4) Nwukwu-na kimchi-lul caghan-ta who-DISJ kimchi-acc like-DECL
Korean: wh+DISJ = ∀

‘Everyone/Anyone likes kimchi.’
ii. Japanese, Malayalam, Kannada: \( wh + DISJ = \exists \), cf. (5ab)

(5) a. \text{dono gakusei - ka- ga rakudai-si-ta} \quad \text{Japanese: } \quad wh + DISJ = \exists

\begin{align*}
\text{‘Some student flunked.’}
\end{align*}

b. \text{n@aan= aar- e- (y)oo kaNDu} \quad \text{Malayalam: } \quad wh + DISJ = \exists

\begin{align*}
\text{I who- ACC- DISJ saw}
\end{align*}

‘I saw somebody.’

Q: \textbf{How to account for the observed variation in interpretation?}

- different interpretive mechanisms?
- OR the same mechanism, but different syntactic structure?

3. \textbf{Japanese: Indeterminate Pronouns + Propositional Quantifiers}


- \textbf{Assumptions}
  i. \( wh \)-expressions are indeterminate pronouns and possess no quantificational force
  ii. As indeterminate pronouns, \( wh \)-expressions only introduce individual alternatives that can expand in a Hamblin semantics of expanding alternatives until they meet an operator that selects them. Alternatives can expand to the propositional level.
  iii. The alternatives are quantified over by the closest c-commanding quantifier
  iv. Quantifiers are \textit{propositional quantifiers} at the sentence level.

3.1 \textbf{Hamblin Semantics: Sample Derivation} (see Kratzer & Shimoyama 2002)

(6)

\begin{align*}
\text{S} & \\
NP & \text{Dare-(ga) nemutta} \\
& \text{who-TOP slept}
\end{align*}

(7) a. \[ [[\text{dare}]]^{w,g} = \{ x: \text{human}(x)(w) \} \]
\[ = \{ \text{Shin, Akemi, Franku, Akira, Leana, …} \} \]
\[ \Rightarrow \text{the set of all humans in w} \]

b. \[ [[\text{nemutta}]]^{w,g} = \{ \lambda x \lambda w’. \text{slept}(x)(w’) \} \]
\[ \Rightarrow \text{the singleton set introducing just one alternative, the property of sleeping.} \]

c. \[ [[\text{dare nemutta}]]^{w,g} = \{ p: \exists x [\text{human}(x)(w) \& p = \lambda w’. \text{slept}(x)(w’)] \} \]
\[ = \{ \text{Shin slept, Akemi slept, Franku slept, …} \} \]
\[ \Rightarrow \text{the set of alternative propositions of the form a, b, c slept} \]

To compute the set of alternative propositions, one functionally applies the VP-denotation to the denotation of the indeterminate pronoun in a ‘pointwise’ fashion:

(8) \[ [[\text{VP}]] ([[\text{dare}]]) = [[\text{VP}]] (\{a, b, c, d, …\}) = \{ [[\text{VP}]](a), [[\text{VP}])(b), [[\text{VP}]](c), \ldots \} \]
3.2 Introducing the quantificational force

- The alternatives can expand until they meet an operator that selects them: Operators can be traditional generalized quantifiers (applying at the DP-level and ranging over alternative individuals) or propositional quantifiers (applying at the sentence level and ranging over alternative propositions):

(9) Propositional quantifiers:
Where \( A \) is a set of propositions, we have:

a. \( \exists(A) = \{ \text{the proposition that is true in all worlds in which some proposition in } A \text{ is true} \} \)

b. \( \forall(A) = \{ \text{the proposition that is true in all worlds in which every proposition in } A \text{ is true} \} \)

c. \( \text{[Neg]}(A) = \{ \text{the proposition that is true in all worlds in which no proposition in } A \text{ is true} \} \)

d. \( \text{[Q]}(A) = A \)

(10) \( \exists ([\text{[dare nemutta]}]) = \{ \text{the proposition that is true in all worlds in which some proposition in } A = \{\text{Shin slept, Akemi slept, Franku slept, …} \text{ is true} \} \)

\( \Leftrightarrow \{ \text{the proposition that is true in all worlds in which some individual slept} \} \)

- Japanese: indeterminate pronoun *dare* ‘human’ + propositional quantifier:

(11) a. \( \text{Q } \ldots [\ldots \text{dare} \ldots] \rightarrow \text{ who} \)

b. \( \text{Neg } \ldots [\ldots \text{dare} \ldots] \rightarrow \text{ nobody} \)

c. \( \forall \ldots [\ldots \text{dare} \ldots] \rightarrow \text{ everybody} \)

d. \( \exists \ldots [\ldots \text{dare} \ldots] \rightarrow \text{ somebody} \)

- In Japanese, some of the quantifying elements occur both at the propositional level (\( \text{ka} = \text{Q} \)) and the DP-level (\( \text{ka} \text{ ‘or’ } \exists \), (\( \text{mo} \text{ ‘and’ } \forall \)).

(12) a. \( [[\text{Dono hon-o yonda} ] \text{ kodomo]-mo yoku nemuttta.} \)

\( \text{which book-ACC read child } -\text{MO well slept} \)

‘For every book \( x \), the child who read \( x \) slept well.’

b. \( [[12a]] = 1 \text{ iff all members of } A = \{ \text{the child who read book a, the child who read book b, the child who read book c, …} \text{ slept well} . \)

- *Extension:*
On a more radical, but universal analysis (Kratzer 2004), all indeterminate pronouns are bound by (covert) propositional quantifiers. Elements such as *ka* ‘or’ and *mo* ‘and’ on the indeterminate pronoun merely function as semantic agreement markers indicating that the indeterminate pronoun must be bound by a covert propositional quantifier, namely ‘\( \exists \)’ or ‘\( \forall \)’ respectively.
see Kratzer (2004) and Butler (2004) for a universal extension of the indeterminate analysis to English

Q: Can we extend this indeterminate account to Hausa?

4. Why the indeterminate account fails for Hausa

• Initially plausible assumption:

The disjunction-marker *koo* in Hausa only indicates the existence of an indeterminate pronoun introducing Hamblin alternatives. This is in line with much current research on *or*, see. e.g. T.E. Zimmermann 2000, Geurts 2003, Simons 2005.

(13) \[[koo + waa]\] = \{ x: human(x)(w) \} = the set of all humans in w

• Arguments against

i. Why would the default reading in sentences without overt quantifiers (i.e. in affirmative episodic sentences) *distributive universal*, and not *existential*, as in Japanese, cf. (14)?

⇒ selectional restriction must be stipulated!

(14) \[koo-waa \ yaa\ ci \ jarràbâwaa\] (Newman 2000:623)

\[\text{DISJ-who 3sg.m.PERF eat exam}\]

‘Everyone passed the exam.’

ii. Systematic gaps: no *wh*-DISJ-expressions in *wh*-questions

(15) Waa ya ci jarràbâwaa?

\[\text{who 3sg.m.rel.PERF eat exam}\]

‘Who passed the exam?’

Q: Why would *wh*-questions in Hausa not make use of indeterminate pronouns?

iii. The behaviour of *wh*-DISJ-expressions under negation

⇒ Prediction: As indeterminate pronouns, *wh*-DISJ-expressions should always be interpreted as negative existential quantifiers (*nobody, nothing*) when embedded under a negative operator

⇒ Recall the key assumption of the indeterminate account: Alternatives introduced by indeterminate pronouns are quantified over by the closest c-commanding quantifier

• Observation:

*Wh*-DISJ-expressions in Hausa receive different interpretations under VP-negation and under CP-negation (with fronted focus constituent), despite the fact that the negation operator is the closest c-commanding operator in both cases.

(16) a. VP-negation: negative existential reading

\[bà-n \ ga \ koo-waa \ ba.\] (Newman 2000:623)

\[\text{NEG-1sg see DISJ-who NEG}\]

‘I didn’t see anyone.’ / ‘I saw no-one.’

\[\text{NOT: ‘I did not see everybody.’}\]
b. CP-negation: negative universal reading

\[ \text{bàà [koo-waa}_{\text{FOC}} [\text{VP} \ këe \ sô-n \ wannàn \ jär]iiddåa ]] \text{ ba.} \] (Newman 2000)

\text{NEG} \ DISJ-who \ PROGrel \ like-of \ this \ newspaper \ NEG

‘Not everyone likes this newspaper.’
\text{NOT}: ‘Nobody likes this newspaper.’

\textbf{Q:} What IS the source of the universal quantification in (16b)?

\section{5. An alternative account for Hausa: Set union triggered by join-operator}

\begin{itemize}
\item Basic Assumptions:
\begin{itemize}
\item i. \text{wh}-DISJ-expressions in Hausa denote genuine universal quantifiers.
\item ii. Their denotation can be locally composed from the meaning of its parts, given assumptions (17a-e) (see also Jayaseelan 2001):
\end{itemize}
\end{itemize}

\begin{enumerate}
\item i. \text{wh}-expressions denote a set variable \text{X}, ranging over sets of individuals (Cooper 1983, Jacobson 1995, Sternefeld 2001), cf. (18a).
\item ii. \text{wh}-expressions in Hausa are inherently focused (Rooth 1985, Beck 2006).
\item iii. Their focus value is the range of possible alternative values for \text{X}, cf. (18b).
\item iv. DISJ-marker \text{koo} is focus-sensitive and denotes the Boolean operator \text{join}, cf. (18c).
\item v. Application of \text{join} at the level of sets results in \text{(big) set union} (Szabolcsi 1997) → Universal quantification over the domain of individuals, cf. (18d).
\end{enumerate}

\begin{enumerate}
\item a. \([\text{waa}]^0 = \text{X, with X = \{x \mid x \text{ is human in w}\}}\]
\item who
\item b. \([\text{waa}]^f = \{\{\text{musa}\}, \{\text{musa, hawwa}\}, \{\text{audu, hawwa}\} \ldots\}
\item c. \([\text{koo}]^0 = \lambda \text{X. join}[[\text{X}]]^f
\item d. \([\text{koo + waa}]^0 = \text{U}[\text{waa}]^f = \{\{m\} \cup \{m, h\} \cup \{a, h\} \cup \ldots\} = \{\{m, h, a, \ldots\}\}
\item the unique set containing the set of all human beings in w
\end{enumerate}

\rightarrow Strictly speaking, the expression in (18d) is the meaning of ‘each and only each’
\rightarrow Lexicalization leads to re-interpretation with weaker truth-conditions (each, every)

\textbf{Q:} How to derive the negative existential reading under VP-negation in (16a)?
\textbf{A:} Obligatory QR out of the VP, see Zimmermann (2008)

\section{6. Cross-linguistic variation}

Given that the indeterminate account does not extend from Japanese to Hausa, there remain two options to account for the observed variation in semantic interpretation:

\begin{itemize}
\item \textit{Option I: Microvariation} - One interpretive mechanism:
\begin{itemize}
\item Extend operator account from Hausa to Japanese
\item Derive the differences in meaning from differences in syntactic structure
\end{itemize}
\end{itemize}
a. Hausa:  
   local composition of DISJ+wh  
   \( \Rightarrow \) application of join-operator at DP-level leads to set union and universal quantification, cf. (18a-d)

b. Japanese, Malayalam: DISJ and wh combine at a distance:  
   \( \Rightarrow \) application of join-operator at propositional level leads to disjunction of propositions and thence to existential quantification (Krifka 2001, Jayaseelan 2001).

\[
(19) \text{ a. } [[\text{dare-(ga) nemutta}]]^0_{\text{who slept}} = X \text{ slept} \\
\text{ b. } [[\text{dare-(ga) nemutta}]]^f_{\text{who slept}} = \{\text{Shin slept, Akemi slept, Franku and Shin slept, …}\} \\
\text{ c. } [[\text{DISJ}]]^0_{\text{who slept}} = \lambda X. \text{join}[[X]]^f_{\text{who slept}} (= (18c)) \\
\text{ d. } [[\text{DISJ dare-(ga) nemutta}]]^0_{\text{who slept}} = \text{Shin slept} \lor \text{Akemi slept} \lor \text{Franku and Shin slept} \ldots \\
\Leftrightarrow \text{Somebody slept}
\]

• **Option II, Macrovariation:** Different interpretive mechanisms in different languages:
  a. Hausa: operator account  
  b. Japanese: indeterminate account  

\( \Rightarrow \) If the indeterminate account is empirically superior for Japanese, the two languages interpret wh-DISJ-expressions in different ways, giving rise to different readings (Zimmermann 2005).

Q: Could the difference in choice of the interpretive mechanism follow from the different availability of propositional quantifiers across languages (Japanese: yes, Hausa, no)?  
\( \Rightarrow \) If so, the observed difference in interpretation would ultimately follow from a difference in the inventory of functional elements

7. **Possible Topics for Class Papers**

- Candidates for Indeterminate Pronouns in other languages (see Kratzer & Shimoyama 2002 on German *irgendein*, Haspelmath 1997)
- ‘Quantificational’ occurrences of ‘and’ and ‘or’ in other languages
- The interpretation of wh-elements in non-interrogative contexts
- Instances of ‘or’ indicating the existence of alternatives
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Syntax-semantics Interface and Cross-Linguistic Variation: Session VI  
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References

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