MODAL CONCORD: FROM A CORPUS PERSPECTIVE

Yanyan Cui
Department of Linguistics, Georgetown University

In this talk, I discuss the distribution of modal expressions embedded under attitude verbs with the aim of better understanding sentences like the one below from Zeijlstra (2008):

(1) The general **demands** that the troops **must** leave.

Sentences such as (1) are treated as a subtype of Modal Concord, the phenomenon where the semantics of a sentence with two co-occurring modal elements seems to contain only one operator (Geurt & Huitink 2006, Zeijlstra 2008, among others). When discussing sentences like (1), authors generally focus on the semantic mechanism that derives the concord reading, without considering the statistical nature of the concord usages. Questions like the following are not asked: does the embedding verb allow other modals in its complement? If so, is the concord case common or marginal compared to other combinations? Do all attitude verbs get involved in concord relation with some modal in its scope? Answers to the questions will shed light on sentences like (1) and Modal Concord in general. In the talk I will report my findings of the investigation done with the Penn Chinese Treebank 7.0 (CTB7).

  I calculated the association between an embedded modal and the syntactic frame it appears in. For example, Table 1 shows the frequencies used to calculate the association between *yiding* and the frame *xiangxin*[$_{IP}$ …]. The measure employed is *pointwise Mutual Information* (PMI=log$_2$(observed frequency/expected frequency)). Note that "not modal *yiding*" includes instances where there is no modal expression in the complement of *xiangxin*.

	xiangxin 'believe' - [$_{IP}$ …]	other attitude verb - [$_{IP}$ …]	Totals
Modal *yiding* 'defintiely'	observed: **14** expected = (76*188)/17893 = **0.799**	62	**76**
Not modal *yiding*	174	17643	17817
Totals	**188**	17705	**17893**

Table 1: Frequencies of *yiding* occurring in the complement of *xiangxin* in CTB7

	yiding 'definitely'	*kending* 'certainly'	*yinggai* 'should'	*keneng* 'might'	*dei* 'have to'	*neng* 'can'	*nenggou* 'be able to'	*keyi* 'may'	*bixu* 'must'
xiangxin 'believe'	**<u>4.132</u>**	**<u>3.113</u>**	0.573	-0.071	0.872	-0.128	1.528	2.018	-0.010
xiwang 'hope'	-1.357	N/A	-1.964	-1.723	-0.809	**<u>2.835</u>**	**<u>3.515</u>**	-0.441	-1.781
yaoqiu 'require'	0.379	N/A	-0.958	0.042	-1.017	-3.073	-0.640	-2.512	**<u>2.655</u>**

Table 2: PMI between attitude verbs and modals in their complements

Table 2 presents the PMI between three attitudes from the *doxastic*, *emotive*, and *directive* class and nine typical modal expressions in Mandarin. The **results** indicate that Modal Concord (bold and underlined) entails high PMI (not vise versa), which means that Modal Concord can be viewed as a kind of *collo-construction* where a normal compositional semantics is not expected. My proposal is that it is better to treat the concord modal as an agreement marker without its own force or treat the whole construction V_att [$_{IP}$…C-Mod…] as a single operator.

References: Anand, P. and **Valentine H.** accepted**.** Epistemics and Attitudes. *Semantics and Pragmatics*. **Gries, S.** 2010. Useful statistics for corpus linguistics. In Sánchez & Almela (ed.), *A mosaic of corpus linguistics: selected approaches*, 269-291. **Geurts**, B. and J. **Huitink** (2006): 'Modal Concord'. In *Proceedings of the ESSLLI 2006 Workshop 'Concord Phenomena at the Syntax Semantics Interface'*. **Zeijlstra,** H. 2008. Modal concord is syntactic agreement. In: M. Gibson & T. Freidman (eds.). *Proceedings of Semantics and Linguistics Theory XVII*. Ithaca, NY: CLC Publications, 317-332.