Classifiers and Mixed Content

Numeral classifiers are a topic that have attracted substantial attention in formal linguistics. These are objects of the form Num+CL, 'Num' a numeral element which has a quantificational function and 'CL' a classifier 'matching' the bare nominal quantified over (1): e.g. *ni-hon-no enpitsu* '2-CL-Gen pencil' (Japanese). Most semantic research in this area has concentrated on the contribution of numeral classifiers to truth conditions. This talk argues that, while the numeral element is indeed purely truth-conditional, the classifier itself simultaneously individuates elements of the nominal domain for quantification and also conventionally implicates the use of a particular quantificational domain.

One can find two main positions in the literature regarding the contribution of numeral classifiers. The first takes them to be quantifiers (e.g. Chierchia 1998); the second to be modifiers (e.g. Kobuchi-Philip 2007). For the purposes of the present paper I will treat them as quantifiers. The question then becomes: what is the contribution of the individual elements Num and CL? Plainly the numeral is the element which performs quantification. I thus take it to be a standard quantifier of type $\langle\langle e,t\rangle,\langle\langle e,t\rangle,t\rangle\rangle$. The classifier is more difficult. Chierchia, among others, argues that the classifier has an individuating function; since (for these theories) bare nominals denote mass terms, the classifier maps their denotations into elements suitable to be quantified over. The existence of pairs like (2) show that this mapping can have truth-conditional import. I will therefore make use of meanings like (3), where the classifier maps nominal denotations to the set of their atomic elements (2b also requires a nonoverlap condition, here omitted).

Intuitively, however, the obvious contribution of classifiers is to restrict quantification to a particular domain. This restriction cannot be truth-conditional, for if it were sentences where the wrong classifier is used would be false, where in fact they are only inappropriate (4). This restriction cannot be presuppositional either, for it does not exhibit binding behavior (5). I conclude that it is conventionally implicated (CI), for it satisfies the criteria for CI content in Potts (2005). However, Potts's system $\mathcal{L}_{CI}$ cannot analyze 'mixed content': lexical items that simultaneously introduce CI and truth-conditional ('at-issue') content. I therefore use the extension $\mathcal{L}_{CI+}$ proposed by McCready (2009) and explicated in the talk. This system adds additional types to the logic for objects of the form $\alpha : \langle\sigma,\tau\rangle^a \blacklozenge \beta : \langle\sigma,\upsilon\rangle^s$, where the left object is at-issue and the right object is CI. In this system the proper denotations can be provided. The classifier *hon*, for instance, will get the denotation in (6), a 'mixed conjunction' of the at-issue content in (3a) and a conventionally implicated domain restriction. It now becomes possible to arrive at adequate denotations for sentences containing numeral classifiers; these will be conjunctions of at-issue quantified content, and conventionally implicated restrictions (7).

(1) a. *ben* (Chinese)/*satsu* (Japanese) restricts the counted objects to books,

b. *hon* (J) to long, thin objects,

c. *mai* (J) to flat objects,

d. *zen* (J) to pairs of chopsticks.

(2) Situation: there are 2 chopsticks.

a. hashi-ga 2-hon aru
chopstick-Nom 2-CL[stick-shaped] exist
'There are 2 chopsticks.' (True)

b. hashi-ga 2-zen aru
chopstick-Nom 2-CL[pair.of.chopsticks] exist
'There are 2 pairs of chopsticks.' (False)

(3) a. $[\![hon]\!] = \lambda Q \lambda P \lambda Q[Q(P \cap At)(Q)]$

b. $[\![zen]\!] = \lambda Q \lambda P \lambda Q[Q(\{\langle x, y\rangle : P(x) \wedge P(y) \wedge At(x) \wedge At(y)\})(Q)]$

(4) # otoko-ga 2-satsu haittekita
man-Nom 2-Cl(books) entered

Quantificational content: '2 men entered.'
Classifier-content: the objects quantified over have the form of books

(5) otoko-ga hon dattara otoko-ga 2-satsu haittekita
man-Nom book Cop-COND man-Nom 2-Cl entered

'If (the) men were books, 2 men entered.'
⇢ the objects under discussion are books

(6) $\lambda Q \lambda P \lambda Q[Q(P \cap At)(Q)] : \langle\langle\langle e,t\rangle,\langle\langle e,t\rangle,t\rangle\rangle,\langle\langle e,t\rangle,\langle\langle e,t\rangle,t\rangle\rangle\rangle^a$ ◆ $\lambda Q[\mathbf{Dom}(Q) \subseteq stick.like] : \langle\langle\langle e,t\rangle^a,\langle\langle e,t\rangle^a,t\rangle\rangle^a,t^s\rangle$.

(7) a. 2-hon-no enpitsu-o katta
2-CL-Gen pencil-Acc bought
'I bought 2 pencils'

b. $2(book)(buy) \bullet \mathbf{Dom}(2) \subseteq stick.like$