Measure Phrases and the *–ka/-lul* alternation in Korean

Languages like Korean and Japanese use certain devices to express amount in noun phrases. In Korean, **classifier phrases** (e.g., *two-classifier* in (1a); **ClPs**) and **measure phrases** (e.g., *ten inches* in (1b); **MePs**) are used for this purpose. Nakanishi (2003, 2004), in her analysis of the Japanese counterpart of (1a), proposes that **Measure Phrases** (including ClPs and MePs; hence **MP**) indirectly measure the event denoted by the verb (2), and that they are subject to the same monotonicity constraint (3) as MPs that modify nouns. Since MePs are subject to the monotonicity constraint, *sip do* '10 degree' can be used to measure out the temperature (4b), but it cannot be used to measure out the ice (4a). Since both ClPs and MePs obey the monotonicity constraint, and they have similar relationships such that the choice of ClPs or MePs is sensitive to the host noun, they would be treated the same in Nakanishi's analyses.

In Korean, ClPs and MePs can optionally have -*ka* or -*lul*. While ClPs must bear the same marker as the host noun (1a), MePs can bear either -*ka* or -*lul* (1b, 4b). Under Nakanishi's proposal that split MPs syntactically combine with VP, this different syntactic behavior between them is not expected. We propose that there are two positions where MPs can occur and that syntactic differences come from locality. MPs within the domain of VP are licensed by–*lul* and MPs outside the domain of VP are licensed by –*ka*. We assume that MPs agree with their host nouns. ClPs are subject to locality, such that ClPs agree with their host within the domain that the licensor and the case marker of the host are isomorphious. In contrast, MePs do not impose locality, and thus they can occur within or outside the domain of VP.

It is well-known that the host noun must agree with its ClP in the local (i.e., closest) domain at S-structure (Kang 2002). For example, in (5a), *10 CL* without the licensor must be related to the object, but not the subject. This follows the assumption that ClPs agree with their host in the local domain. Since both subjects and objects allow split ClPs (5b), there must be more than one position for ClPs to occur in a sentence: one within the domain of VP and the other outside the domain of VP. Furthermore, VP-preposing shows that the object and a verb form a constituent excluding the ClPs (5c). This indicates that ClPs are generated higher than their host nouns. Sim (2003) argues that Korean involves obligatory object shift with an accusative case checking head, *v*, which is lower than the external argument-introducing head, *Voice*, but higher than VP. If this is the case, then we have the structure (6). ClPs are generated higher than objects/ subjects, i.e., in [spec, VoiceP] and [spec, VP], respectively. The object moves to the specifier position of the accusative case checking head, and the subject moves to the subject position. Locality accounts for why the ClP, *two pieces*, in (1a) cannot have the licensor, -*lul*. Since the host has nominative case, the ClP must be in the outside of the domain of VP.

MePs in (1b), in contrast, can occur either in the outside the domain of VP, [spec, VoiceP], or within the domain of VP, [spec VP]. MePs in the higher position are licensed by –*ka* and MePs in the lower position are licensed by –*lul*. Unlike classifier phrases, MePs are not subject to locality. Therefore, MePs can occur in either position.

A potential counter-example to the current analysis that -*ka* and -*lul* are licensors of MPs comes from the sentences with an external argument (7). Being a MeP, it is predicted that *sip inchi* 'ten inch' would allow both licensors, -*ka* and –*lul*. However, it cannot have the licensor,-*ka*. In contrast, ClPs can co-occur with external arguments (5b). This incompatibility between external arguments and MePs may have its root in the semantics of the Voice head. The two MP positions are related to two types of homomorphism *h* from events to individuals: the neo-Davidsonian agent function (8a) and the verb denotation understood as a functional relation between events and individuals (8b) (Nakanishi 2004). When Voice introduces an agent, the higher measure function μ is limited to the homomorphism of the neo-Davidsonian agent function, allowing ClPs which are semantically compatible. In contrast, MePs are not compatible with the agent function or agentivity. Therefore, they occur only within the domain licensed by -*lul*. The absence of the agent, however, changes the situation, since the agent function cannot be applied to the measure function in the higher position. Consequently, the measure function in the –*ka* domain takes the homomorphism (8b) instead of (8a) and, thus, MePs are semantically compatible with the licensor, –*ka*.

The current proposal accounts for the distribution of MPs and their interaction with licensors, -*ka* and –*lul*, in addition to their semantic similarities and differences. It also accounts for other measure phrases that may have licensors such as *n-times*, about which we will discuss at the presentation if time permits.

(1) a. elum-i cinan pam-ey **twu cokak-i** / ***twu cokak-ul** el-ess-ta.
ice-nom last night-at two piece-nom / two piece-acc freeze-past-decl
'Two pieces of ice were frozen last night.'

b. elum-i cinan pam-ey **sip inchi-ka** / **sip inchi-lul** el-ess-ta.
ice-nom last night-at ten inch-nom / ten inch-acc freeze-past-decl
'The water froze 10 inches thick last night.' (lit. 'The ice froze 10 inches thick last night.')

(2) The indirect measure function μ' is monotonic relative to the domain E iff:
For events e_a, e_b in E: If $h(e_a)$ is a proper subpart of $h(e_b)$, then $\mu'(h(e_a)) < \mu'(h(e_b))$, where h is a homomorphism from E to I such that $h(e_1 \cup_E e_2) = h(e_1) \cup_I h(e_2)$ (Nakanishi 2003)

(3) μ is monotonic relative to domain I iff:
For individuals x, y in I: If x is a proper subpart of y, then $\mu(x) < \mu(y)$ (Schwarzschild 2002)

(4) a.* elum-i cinan pam-ey **sip do-ka** / **sip do-lul** el-ess-ta.
ice-nom last night-at ten degree-nom / ten degree-acc freeze-past-decl
'The ice froze 10 degree last night.'

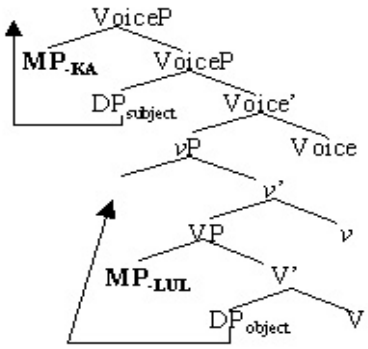
b. pang-euy onto-ka **sip do-ka** / **sip do-lul** ol-ass-ta.
room-gen temperature-nom 10 degree-nom / 10 degree-acc increase-past-decl
'The room's temperature increased by 10 degrees.'

(5) a. haksayng-tul-i chinku-tul-ul **yel myeng** man-ass-ta.
student-PL-nom friend-PL-acc ten CL meet-past-decl
'Students met 10 friends.' '*10 students met friends.'

b. haksayng-tul-i ecey **twu myeng-i** chinku-tul-ul kil-eyse **yel myeng-ul** man-ass-ta.
student-PL-nom yesterday two CL-nom friend-PL-acc road-at ten CL-acc meet-past-decl
'Two students met 10 friends on the street yesterday.'

c. [**Chinku-tul-ul man-a-ki**]-nun Yoda-ka **twu myeng-ul** man-ass-ta.
friend-PL-acc meet-A-nmz-top Yoda-nom 2 CL-acc meet-past-decl
'As for friend-meeting, Yoda met two.'

(6)



(7) Yoda-ka elum-ul ecey ***sip inchi-ka** / **sip inchi-lul** el-li-ess-ta.
Yoda-nom ice-acc yesterday ten inch-nom/ ten inch-acc freeze-make-past-decl
'Yoda froze the ice 10 inches thick yesterday.'

(8) Homomorphism (based on Nakanishi 2004, 172-173)
a. *h* outside the domain of VP: $\forall e_1, e_2 \in D_E$ [$\text{Agent}(e_1 \cup_E e_2) = \text{Agent}(e_1) \cup_I \text{Agent}(e_2)$]
b. *h* within the domain of VP : $\forall e_1, e_2 \in D_E$ [$\text{verb}(e1 \cup_E e_2) = \text{verb}(e_1) \cup_I \text{verb}(e_2)$]

Selected References

Nakanishi, Kimiko. 2003. Semantics of Measure Phrases. In M. Kadowaki and S. Kawahara eds., *The Proceedings of the 33rd Conference of the North East Linguistic Society*, 225-244.; Nakanishi, Kimiko. 2004. Domains of Measurement: Formal Properties of Non-Split/Split Quantifier Constructions. Doctoral dissertation. University of Pennsylvania.