Syntax and Semantics of Korean Sentental Complements of Nouns

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0. Introduction

This paper* presents a syntax and interpretation for sentential complements of nouns in Korean. The sentences in (1) show two types of complements. (Abbreviations. SP=Subj. Particle; AcP=Accus. Particle; S=Sentence; CMP=Complementizer; PRS=Present; PST=Past; DEC=Declarative)

(1) a. mica ka tongswu lul coahanun (ku) sasil ka chelswu lul kwelophinta.
Mica SP Tongswu AcP like the fact SP Chelswu AcP bother DEC
'The fact that Mica likes Tongswu bothers Chelswu.'

b. mica ka tongswu lul coahantanun (ku) cwucang ka chelswu lul kwelophinta.
SP AcP like the claim SP AcP bother
'The claim that Mica likes Tongswu bothers Chelswu.'

The noun complement constructions in (1a) and (1b) are semantically different. Nouns such as *cwucang* 'claim,' *kongpho* 'fear,' *kitay* 'expectation,' *poko* 'report,' ets., even if they are simply preceded by *ku* 'the,' entail that there is a person who claims, fears, expects, reports, etc. On the other hand, a phrase such as *S ku sasil* 'the fact that S' is

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not interpreted as 'someone's fact that S.'[1]

Also, in the *fact*-type complements, any (conventional) implicature originating in the complement sentence becomes an implicature of its immediately larger construction, while this is not true of the *claim*-type complements. The sentences in (2) show this phenomenon.

(2) a. mica to tongswu lul coahanun (ku) sasil ka chelswu lul nollakeyhanta.
too AcP like the fact SP AcP amaze
oynyahamyen mica iweey amwuto tongswu lul ani coaha ki ttaymwunita.
because but anyone AcP not like (because)
'The fact that Mica, too, likes Tongswu amazes Chelswu, because no one but Mica likes Tongswu.'

b. mica to tongswu lul coahantanun (ku) cwucang ka chelswu lul nollakeyhanta.
too AcP like the claim SP AcP amaze
oynyahamyen mica iweey amwuto tongswu lul ani coaha ki ttaymwunita.
because but anyone AcP not like (because)
'The claim that Mica, too, likes Tongswu amazes Chelswu, because no one but Mica likes Tongswu.'

In previous papers (Lee 1977a & 1979a), I presented the semantic aspects of Korean delimiting particles such as *to* 'too,' *man* 'only,' etc. For instance, sentence (3a), which contains the particle *to* 'too,' is understood to conventionally implicate (3b).

(3) a. mica to tongswu lul coahanta.
too AcP like DEC
'Mica, too, likes Tongswu.'

b. There is an x (x is a person; x≠Mica) such that x likes Tongswu.

This implicature is the implicature of the noun complement itself in (2a), and equally in (2b). In (2a) this implicature is carried over into the larger construction, while this is not the case in (2b). This is why (2a) seems self-contradictory and (2b) does not. I would like to attribute this phenomenon to the semantic characteristics of the nouns *sasil* 'fact' in (2a) and *cwucang* 'claim' in (2b).

Furthermore, the *fact*-type complement entails that the proposition expressed by the complement sentence is true, while this entailment is absent from the *claim*-type complements. Just like their English translations (cf. Kiparsky & Kiparsky 1971), sentence (1a)

[1] It was observed to me by Kiyong Lee (at the 17th meeting of the Linguistic Society of Korea: Seokang U. -Feb. 1, 1980 and also by Chungmin Lee, personal communication) that the construction '[...nun]$_S$(ku) sasil' 'the fact that S' may have a variant: '[...hantanun]$_S$(ku) sasil.' However, it seems to me that the latter construction is a contracted form of the construction '[$_{S_1}$[$_{S_0}$ ...hanta]$_{S_0}$ (ko ha) nun]$_{S_1}$ (ku) sasil' 'the fact that (someone) says that [...hanta]. Therefore, it seems that the two constructions are not interchangeable variants.

Chungmin Lee (personal communication) also observes nouns such as *somwun* 'rumor.' Whose rumor can be denoted? I think that we can postulate some unidentified person(s) who spread the rumor specified by the complement.

entails the truth of the proposition expressed by the complement sentence *mica ka tongswu lul coahanta* 'Mica likes Tongswu,' while sentence (1b) lacks this entailment.

To formally represent these semantic characteristics of the two complement types, I adopt a revised version of Montague's framework sketched is such works as Partee(1975), Thomason (1976a,b), Bennett (1975), Karttunen & Peters (1975, 1976, forthcoming), and Peters (1977). Specifically, I make use of Montague's translations and meaning postulates, plus the notion of 'conventional implicature.' To this end I now introduce a small fragment of Korean.

1. Syntactic Apparatus

Syntactic rules in Montague's framework combine expressions of a specified category. A complete grammar of Korean should include a large set of syntactic categories and a large number of syntactic rules (cf. Lee 1979a). In this paper, however, I will introduce a minimum set of relevant syntactic categories; namely, those given in (4).

(4)

Category	*Set of Basic Expressions*
t (Declarative sentence)	{Λ}
IV (Intr. verb (phrase))	{*ca* 'sleep,' *ket* 'walk,'....}
T (Terms or NP's)	{*mica, tongswu, chelswu,* K_0,...}
TV (Tr. verb)	{*mek* 'eat,' *coaha* 'like,' *salangha* 'love,' *silheha* 'hate,' *mit* 'believe,'...}

In general, a category may consist of basic expressions and derived phrases. Category t contains only derived phrases, no basic ones. The basic expressions of the other categories are self-explanatory except for K_0, K_1, etc., which are the convenient representations of (indexed) pronouns (perhaps comparable to the item PRO in a generative transformational grammar (cf. Chomsky 1977:82 & Jackendoff 1977:87). These sets of basic expressions will function as a small lexicon of Korean in this paper. Now, to derive declarative sentences such as those given in (5), two syntactic rules are formulated in (6).

(5) a. mica ka canta.
SP sleep
'Mica sleeps.'

b. mica ka tongswu lul coahanta.
SP AcP like
'Mica likes Tongswu.'

(6) *Syntactic rules*

Rule 4 (Subject rule): If $\alpha \in P_{t/IV}$ and $\beta \in P_{IV}$, then $F_3(\alpha, \beta) \in P_t$ and $F_4(\alpha, \beta) \in P_t$, where $F_3(\alpha, \beta) = \alpha'\beta'$ and α' is α plus the subject particle *ka* and β' is the result of replacing the last verb in β by its present indicative form; and where $F_4(\alpha, \beta)$ results from β by inserting α plus the subject particle *ka* im-

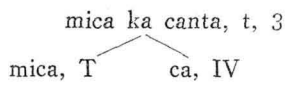
mediately before the first verb in β, and replacing the last verb in β by its present indicative form.[2]

Rule 5 (Accusative rule): If $\alpha \in P_T$ and $\beta \in P_{IV/T}$, then $F_5(\alpha, \beta) \in P_{IV}$, where $F_5(\alpha, \beta) = \alpha(lul)\ \beta$.

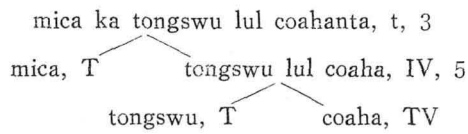
P_A is understood to be the set of phrases of the category A (PTQ:250). Although the present tense and indicative mood are introduced by Rule 4 (subject rule), this part of the rule is not directly relevant to the present purpose. More complicated rules of tense and mood will be needed for an adequate grammar of Korean. F_4 in Rule 4 represents the syntactic phenomenon of scrambling in Korean, which can change the word order of noun phrases without affecting the meaning of the sentence. This is not my direct concern here. One of the important characteristics of the two rules is the fact that they introduce case marking particles.[3]

A syntactic derivation in Montague grammar is represented in terms of an analysis tree. Sample derivations are given in (7).

(7) a. (=5a)



b. (=5b)



In the analysis trees, the number at the end of each non-terminal node label refers to the functional rule which has been applied to combine appropriate phrases, and the category name in each node label indicates what category the derived or basic expression, whichever it is, belongs to. For example, in analysis tree (7b) Rule 5 (accusative rule) combines *tongswu* (T) and *coaha* 'like' (TV) to derive an IV phrase, *tongswu lul coaha* 'like Tongswu.' Then F_3 of Rule 4 (subject rule) combines this derived IV phrase with *mica* (T) to result in a sentence *mica ka tongswu lul coahanta* (t) 'Mica likes Tongswu.' If F_4 applies, the result would be a sentence *tongswu lul mica ka coahanta*. (I do not deal in this paper with any semantic differences between these two sentences.) Analysis trees disambiguate a sentence that is syntactically ambiguous.[4] Every syntactic rule is accompanied by its se-

[2] The subject particle would be either *ka* or *i* depending upon its immediately preceding letter: if vowel it is *ka*, and if consonant *i*. A similar variation holds for the accusative particle between *lul* and *ul*. In what follows, for convenience, I would like to stick to *ka* and *lul*.

[3] As for the case marking device, Barbara H. Partee (lecture at U. of Texas: 3/31~4/1, 1977 and personal discussion) proposes rules similar to the ones postulated here.

[4] Montague syntax is often criticized as unsatisfactory. It is a bottom-to-top syntax in the sense that the syntactic rules build up larger syntactic structures by combining smaller parts as their constituents, as illustrated above. This is in line with the context free phrase structure rules.

It was shown by Cooper & Parsons (1976) that Montague syntax and generative transformational syntax are not incomparable. They demonstrated the equivalence of a Montague syntax and a

mantic interpretation rule.

2. Karttunen & Peters Semantics

One of the most important features of Montague semantics is the principle of compositionality, which says that the meanings of complex phrases are determined by the meanings of their parts and the manner of their combination by syntactic rules. Each syntactic rule is accompanied by a translation rule which assigns to the phrases derived by that syntactic rule an appropriate interpretation expressed in terms of intensional logic. It is assumed that each phrase in the lexicon of a language (say, Korean) has as its translation an expression of intensional logic with the same meaning. It was noted by Karttunen & Peters (1975), however, that a single-expression translation is not sufficient to account for a certain aspect of meaning; namely, conventional implicature.

The notion of conventional implicature, due to Grice(1975), is adopted and enriched in a series of papers by Karttunen & Peters (1975, 1976, forthcoming). For the moment conventional implicature is roughly understood to mean the non-asserted aspects of meaning of an expression. Karttunen & Peters (1975:267) believe that many so-called presuppositions can better be regarded as conventional implicatures. A lexical item, as well as certain grammatical constructions, may be the source of implicatures.

As mentioned above, in PTQ each translation assigns a single logical expression which represents the denotation of the generated phrase. To overcome the insufficiency of this single-expression translation, Karttunen & Peters propose to translate a phrase to pairs of logical expressions: namely, an *extension expression* and an *implicature expression.* The extension expression is identical to Montague's single expression. The implicature express-

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syntax comparable to a generative transformational syntax (called Cooper-syntax) by showing that the sentences generated by the former can equally be generated by the latter, and vice versa. Thus, for the present concern, it would not really matter how the syntactic structures are derived.

The bottom-to-top syntax is effective in building up a grammar which can explicitly show the relationships between syntactic rules (or structures) and semantic translation rules. In other words, in this approach we can build up syntactic structures while effectively giving their semantic interpretations simultaneously, in accordance with the Fregean(1892[1975]) compositionality principle.

It was noted by williams (1977) that all syntactic categories can be the domain of transformational cycles, and that all rules that have a given domain as their maximal domain of application are ordered before all rules of any larger domain. As suggested in a paper by Bach (1977c), this idea naturally fits with the Montague-type bottom-to-top syntax.

Partee (1975) and Bennett (1975), among others, have attempted to incorporate transformational operations into the Montague syntax. Recently, Bach(1977c) sketched a Montague-type grammar in which some transformation-like operations may operate on expressions that are not sentences, and Peters (a talk at the Meaning and Cognition Workshop: U. of Texas at Austin: July 8, 1978) sketched a grammar which, to say roughly, consists of context free syntax and compositional semantics.

Taking these observations into consideration, I assume a syntactic framework which, putting other details aside, consists of Montague's bottom-to-top syntactic derivation and appropriate transformational operations of the sort mentioned above.

ion represents conventional implicatures which a phrase may carry with it. In addition, in order to determine how the implicatures of embedded constituents are inherited by the complex phrase which is constructed from them, it is necessary to introduce another function, which is called a heritage function h. This is defined whenever necessary and written as α^h for short for an expression α. Under this approach, any Korean phrase α has the form of translation α' as shown in (8).

(8) $\alpha' = \langle \alpha^e; \alpha^i \rangle$, where α^e=extension expression of α
α^i=implicature expression of α
and α^h is defined whenever necessary.

Now, the translation rules accompanying the syntactic rules, R4, and R5, are formulated as in (9).

(9) a. *Translation rule* 4: If $\alpha \in P_{t/IV}$, and $\beta \in P_{IV}$, and if α translates to $\langle \alpha^e; \alpha^i \rangle$ and β translates to $\langle \beta^e; \beta^i \rangle$, then $F_3(\alpha, \beta)$ and $F_4(\alpha, \beta)$ translate to $\langle \alpha^e({}^\wedge\beta^e); [\alpha^i({}^\wedge\beta^e) \wedge \alpha^h({}^\wedge\beta^i)] \rangle$.

b. *Translation rule* 5: If $\alpha \in P_T$, $\beta \in P_{IV/T}$, and if α translates to $\langle \alpha^e; \alpha^i \rangle$ and β translates to $\langle \beta^e; \beta^i \rangle$, then $F_5(\alpha, \beta)$ translates to $\langle \beta^e({}^\wedge\alpha^e); \lambda x[\beta^i({}^\wedge\alpha^e)(x) \wedge \beta^h({}^\wedge\alpha^i)(x)] \rangle$.

To see how these translation rules work, let us look at sentence (5b), as an example, which is given in the form of analysis tree (7b). As noted above, the principle of compositionality says that the meaning of a derived phrase is determined by the meanings of its parts. Thus the meaning of the sentence *mica ka tongswu lul coahanta* 'Mica likes Tongswu' should be built starting from its parts. That is, the meaning representation of this sentence is obtained by the combination of the translations of the lexical items, *mica*, *tongswu*, and *coaha* 'like,' in the way specified by the translation rules, TR4 and TR5. In this paper I use individuals instead of individual concepts as in PTQ (cf. Bennett 1975 and Karttunen & Karttunen 1976). Thus the extension expression, i.e., Montague's single translation expression, for phrases such as *mica* and *tongswu* are fixed as in (10).

(10) a. $\text{mica}^e = \lambda PP\{m\}$
b. $\text{tongswu}^e = \lambda PP\{t\}$

P (likewise Q) is a variable ranging over properties of individuals (i.e., of type $\langle s, \langle e, t \rangle \rangle$), and $\lambda PP\{m\}$ is an expression denoting the set of properties possessed by the individual that m denotes. For expository purpose, I will assume that sentence (11) implicates sentence (12). (I adopt this assumption solely to illustrate the effect of translation rules TR4 and TR5; nothing of substance hinges on it.)[5]

[5] It was observed to me by Winfred Lehmann that millions of Americans say "I like Ike" without knowing him. Although I indicated that the assumption about the relation between *coaha*

(11) mica ka tongswu lul coahanta.
SP AcP like
'Mica likes Tongswu.'

(12) mica ka tongswu lul al-nunta.
SP AcP know
'Mica knows Tongswu.'

That is, the Korean phrase *coaha* 'like' carries the meaning of *al* 'know' as its conventional implicature. The names *mica* and *tongswu* can also be assumed to carry conventional implicatures, viz. the sex of the person named: i.e., *mica* is female and *tongswu* is male. Given these assumptions, the implicature expressions of the three phrases would be as in (13).

(13) a. $\text{mica}^i = \lambda P\ \text{female}^e(m)$
b. $\text{tongswu}^i = \lambda P\ \text{male}^e(t)$
c. $\text{coaha}^i = \lambda \mathfrak{p} \lambda x \mathfrak{p}\{{}^\wedge\lambda y\ \text{know}_*{}^e(x, y)\}$

$\mathfrak{p}$ (likewise Q) is a variable ranging over properties of properties individuals (of type $\langle s, \langle\langle s, \langle e, t\rangle\rangle, t\rangle\rangle$), and x and y range over individuals (i.e., are of type e). The sub-star convention is used to represent a constant of intensional logic which designates a certain relation between individuals. That is, in PTQ $\text{know}_*{}^e(x, y)$ would express the proposition that x stands in the relation of *al* 'know' to y. The heritage expression determines whether a functor phrase is a hole, a plug, or a filter, in the sense introduced in Karttunen (1973). For the phrases under consideration heritage expressions are defined as in (14).

(14) a. $\text{mica}^h = \lambda PP\{m\}$
b. $\text{tongswu}^h = \lambda PP\{t\}$
c. $\text{coaha}^h = \lambda \mathfrak{p} \lambda x \mathfrak{p}\{{}^\wedge\lambda z\ z = z\}$

Here the heritage expression of *coaha* 'like' is formulated so as to guarantee that in an IV phrase formed by combining a TV phrase *coaha* 'like' with a T phrase, e.g., *tongswu*, the implicature carried by *tongswu* becomes an implicature of the IV phrase *tongswu lul coaha* 'like Tongswu.' In other words, the functor *coaha* 'like' is a hole here. This is il-

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'like' and *al* 'know' is an expository purpose, the verb *al* 'know,' as the implicature of the verb *coaha*, may be regarded as any type of knowing, including a spiritual (or indirect) knowing. Chungmin Lee (personal communication) suggests that I need a more satisfactory explanation about the relationship between the verb *al* 'know' and *coaha* 'like'. He notes the following sentences:

i) na ku salam cal moluciman, coahay.
'Although I do not know him well, I like him.'

ii) ku nye nun ku namca lul alcito mos hamyense coahanta.
'She likes him even though she does not know him.'

These sentences can be accounted for if we consider the degree of knowing denoted by the verb *al*. As for an observation on the relationship between *know* and other verbs, readers are referred to Bennett (1977).

lustrated in (15). For convenience, I use English words as constants of intensional logic translating Korean words other than proper names.

(15) $like^h({}^\wedge tongswu^i) = \lambda p \lambda x p\{{}^\wedge\lambda z\ z=z\}({}^\wedge\lambda P\ male^e(t))$
$\equiv \lambda x[\lambda P\ male^e(t)]({}^\wedge\lambda z\ z=z)$
$\equiv \lambda x\ male^e(t)$

Now, under the present translation mechanisms, we have translations of the three Korean phrases as given in (16).

(16) a. $mica' = \langle mica^e;\ mica^i\rangle = \langle \lambda PP\{m\};\ \lambda P\ female^e(m)\rangle$
b. $tongswu' = \langle tongswu^e;\ tongswu^i\rangle = \langle \lambda PP\{t\};\ \lambda P\ male^e(t)\rangle$
c. $coaha' = \langle like^e;\ like^i\rangle = \langle like^e;\ \lambda p \lambda x p\{{}^\wedge\lambda y\ know^e_*(x, y)\}\rangle$

With this preparation, let us translate sentence (5b) in accordance with analysis tree (7b). First of all, translation rule 5 translates the IV phrase *tongswu lul coaha* 'like Tongswu' as in (17).

(17) a. $tongswu\ lul\ coaha^e = like^e({}^\wedge\lambda PP\{t\})$
b. $tongswu\ lul\ coaha^i$
$= \lambda x[like^i({}^\wedge tongswu^e)(x) \wedge like^h({}^\wedge tongswu^i)(x)]$
$= \lambda x[\lambda p \lambda w p\{{}^\wedge\lambda y\ know^e_*(w, y)\}({}^\wedge\lambda PP\{t\})(x) \wedge \lambda p \lambda w p\{{}^\wedge\lambda z\ z=z\}({}^\wedge\lambda P\ male^e(t))(x)]$
$\equiv \lambda x[\lambda w[\lambda PP\{t\}]({}^\wedge\lambda y\ know^e_*(w, y))(x) \wedge \lambda w[\lambda P\ male^e(t)]({}^\wedge\lambda z\ z=z)(x)]$
$\equiv \lambda x[\lambda w[\lambda y\ know^e_*(w, y)(t)](x) \wedge \lambda w[male^e(t)](x)]$
$\equiv \lambda x[\lambda w\ know^{e\,e}_*(w, t)(x) \wedge \lambda w[male^e(t)](x)]$
$\equiv \lambda x[know^e_*(x, t) \wedge male^e(t)]$

Then, according to translation rule 4, the phrase (a sentence) *mica ka tongswu lul coahanta* 'Mica likes Tongswu' is translated as in (18).

(18) a. $mica\ ka\ tongswu\ lul\ coahanta^e = mica^e({}^\wedge like^e({}^\wedge tongswu^e))$
$\equiv like^e_*(m, t)$
b. $mica\ ka\ tongswu\ lul\ coahanta^i$
$= [mica^i({}^\wedge tongswu\ lul\ coaha^e) \wedge mica^h({}^\wedge tongswu\ lul\ coaha^i)]$
$\equiv [mica^i({}^\wedge like^e({}^\wedge\lambda PP\{t\})) \wedge mica^h({}^\wedge\lambda x[know^e_*(x, t) \wedge male^e(t)])]$
$\equiv [\lambda P\ female^e(m)({}^\wedge like^e({}^\wedge\lambda PP\{t\})) \wedge \lambda PP\{m\}({}^\wedge\lambda x[know^e_*(x, t) \wedge male^e(t)])]$
$\equiv [female^e(m) \wedge x[know^e_*(x, t) \wedge male^e(t)](m)]$
$\equiv female^e(m) \wedge know^e_*(m, t) \wedge male^e(t)$
c. $mica\ ka\ tongswu\ lul\ coahanta'$
$= \langle like^e_*(m, t);\ [female^e(m) \wedge know^e_*(m, t) \wedge male^e(t)]\rangle$

The heritage expression of the whole sentence should be trivial since the category t could not have the role of functor. So far, I have attempted to show how the postulated syntac-

tic and translation rules work in deriving and translating Korean sentences.

3. *cwucang* 'claim' and *sasil* 'fact'

In this section, with the principles and techniques discussed in previous sections, syntactic and semantic rules are formulated to account for the sentential complements of nouns.[6] The syntactic categories (in 4), syntactic rules (in 6), and translation rules (in 9) are not enough for this purpose. An extension of this small fragment should first be made (cf. Lee 1978b). New syntactic categories are introduced in (19).

(19) *New syntactic categories*

Category	*Basic expressions*
a. PN/t	{*cwucang* 'claim,' *kitay* 'expectation,' *kongpho* 'fear,' *mitum* 'belief,' *sayngkak* 'thought,' ....}
b. CN/t	{*sasil* 'fact,' *myengcey* 'proposition,' ....}[7]

In (19) *cwucang* 'claim' type nouns are distinguished from *sasil* 'fact' type nouns in terms of different syntactic categories. This decision is supported by the following syntactic phenomena: First, as shown in the sentences is (1) and (2), the two types of complements are constructed by two different syntactic operations. Specifically, in the *sasil* 'fact' type noun complements, the sentence combines with a head noun, while dropping the declarative mood marker. On the other hand, in the *cwucang* 'claim' type complements only a particle *nun* is added to the complete declarative sentence. The phenomenon is shown in (20).

(20) a. [.....coaha nun ta]——[[.....coaha nun] sasil]
S like PRS DEC S like PRS fact

b. [.....coaha nun ta]——[[.....coaha nun ta nun] cwucang]
S like PRS DEC S like PRS DEC ? claim

I would not be particularly concerned with the exact status of the particle *nun* in (20b: marked with a question mark). It would suffice to note that the two constructions result from two different syntactic operations. Second, the nouns of the *cwucang* 'claim' category (PN/t) can be verbalized (e.g., *cwucangha* 'claim (v.),' *kitayha* 'expect,' etc.), while this is not true of the *sasil* 'fact' type nouns.[8]

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[6] Some of the ideas are due to Stanley Peters.

[7] This postulation of the categories, however, does not exclude the possibility that the nouns under consideration can belong to still another category. Look at the relative clause in (i).

(i) tongswu ka poyecwun ku sasil 'the fact that Tongswu showed'
SP show the fact

In any rule of relative clauses (deletion or quantifying-in), it should be necessary to derive a T-phrase *ku sasil* 'the fact.' This can be done by making the noun *sasil* 'fact' a basic member of the category CN.

[8] Later in this section I will regard such nouns as *soli* 'sound' and *moyang* 'manner' as members

Lexical items of these categories are to combine with sentential complements, but the resulting categories will be different. For these operations, new syntactic and translation rules are formulated in (21).

(21) *New syntactic and translation rules*

S57a. If $\alpha \in P_{PN/t}$ and $\phi \in P_t$, then $F_{57a}(\alpha, \phi) \in P_{PN}$, where $F_{57a}(\alpha, \phi) = \phi$ *nun* α.[9]

S57b. If $\alpha \in P_{CN/t}$ and $\phi \in P_t$, then $F_{57b}(\alpha, \phi) \in P_{CN}$, where $F_{57b}(\alpha, \phi) = \phi'\alpha$ and ϕ' comes from ϕ by deleting the declarative marker.

T57. $\langle \alpha^e({}^\wedge\phi^e);\ \lambda x[\alpha^i({}^\wedge\phi^e)(x) \wedge \alpha^h({}^\wedge\phi^i)(x)]\rangle$

As mentioned above, constructions (22a) and (22b) are semantically different.

(22) a. [S] ku cwucang 'the claim that [S]'
b. [S] ku sasil 'the fact that [S]'

For nouns such as *cwucang* 'claim,' *kitay* 'expectation,' *kongpho* 'fear,' etc., it is reasonable to assume that there is a person who claims, expects, fears, etc. This is not true of nouns such as *sasil* 'fact' and *myengcey* 'proposition.' For instance, the construction [[S] ku sasil] 'the fact that [S]' is not interpreted as 'someone's fact that [S].'[10] I established a syntactic distinction between the *cwucang* 'claim' type noun complements and the *sasil* 'fact' type noun complements on the basis of syntactic phenomena. This distinction is useful in providing a satisfactory account of the semantic differences between (22a) and (22b). The syntactic category of the noun *cwucang* 'claim' (PN/t) is different from that of the noun *sasil* 'fact' (CN/t). Consequently, they are supposed to undergo different syntactic rules. Among other things, in order to incorporate the possessive relation in structures such as (22a) into syntactic rules, I propose a transformational rule given in (23).

(23) *A meaning-preserving transformation*

Trf. 1, n: [S] K_0 uy cwucang→[S] ku cwucang
's claim the claim
'he$_0$'s claim that [S]' 'the claim that [S]'

In (23) K_0 is comparable to a pro-form with an index in a generative grammar (cf. Chom-

of the *sasil* 'fact' class. These nouns can be verbalized (in a quite different sense though). By the verbalization of the noun *cwucang* 'claim,' for instance, I mean that we may have another construction (see ib below) which can share the same semantic content with its noun complement.

(i) a. mica ka tongswu lul coahantanun chelswu uy cwucang
SP AcP like 's claim
'Chelswu's claim that Mica likes Tongswu.'
b. mica ka tongswu lul coahanta ko chelswu ka cwucanghanta.
SP AcP like CMP SP claim (v.)
'Chelswu claims that Mica likes Tongswu.'

[9] The particle *nun* is discussed in detail in Lee (1978). Here I will not consider the issue of tense and mood, which is not directly relevant to the present concern.

[10] Partially for this reason, in English a possible rule of *fact*-deletion would not affect the semantic content of the construction. I do not believe there to be a *sasil* 'fact' deletion rule in Korean. There is a pro-formation rule, as will be examplified later in (38).

sky 1977:82). This transformation introduces the *ku* 'the' in (22a). The *ku* 'the' in (22b) is derived by Montague's syntactic rule 2.[11] Let me first attempt to formulate rules for the construction of [[S] ku cwucang] 'the claim that [S]' in sentences such as (1b: repeated).

(1b) mica ka tongswu lul coahantanun ku cwucang ka chelswu lul kwelophinta.
SP AcP like the claim SP AcP bother
'The claim that Mica likes Tongswu bothers Chelswu.'

Montague's syntactic rule 2 introduces determiners *the*, *a* (or *an*), and *every* in English. Thomason (1976b:13) treats unspecified possessive pro-forms, *his*$_0$, *his*$_1$, etc., as determiners (i.e., of category T/CN), along with regular determiners. By assigning special translations to each of the determining words,[12] his translations of T-phrases come to be equivalent to Montague's translations.

Here, without going into further details,[13] I would like to treat possessive forms such as those in (24) as derived determiners (of category T/PN), which are to combine with the outputs of S57a in (21).

(24) a. K_0 uy '*his*$_0$,' K_1 uy '*his*$_1$,' ... (T/PN)
b. *mica uy* 'Mica's,' *cyon uy* 'John's,' ... (T/PN)

I will also make the possessive forms in (24) belong to Thomason's category T/CN. This is necessary to account for the phrases in (25).

(25) a. K_0 uy kho 'he$_0$'s nose'
's nose
b. mica uy kho 'Mica's nose'

In other words, I assume two categories of possessive determiners (cf. fn. 13): one (T/CN) for the phrases in (25), and the other (T/PN) for noun complements with a posses sive determiner. For the former Thomason's (1976b:22-23) translation is assumed to be correct. The possessive determiners in (24) are translated in (26). As far as the semantic type is concerned, both CN and PN are assumed to have the same type.

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[11] The words *ku* 'the' and *han* 'a or an' are frequently deleted. This means that marking definiteness and indefiniteness is not syntactically obligatory in Korean. In order to account for the syntactic characteristics of noun complements, the rule should actually be amended so that it mention that the *ku* (likewise *han*) is inserted between the head noun and the complement sentence. I would simply like to assume this syntactic process.

[12] a. *ku* 'the' $=\lambda Q\lambda P\ Vx[\Lambda y[Q\{y\}\leftrightarrow x=y\} \wedge P\{x\}]$
b. *han* 'a' $=\lambda Q\lambda P\ Vx[Q\{x\}\wedge P\{x\}]$
c. *mata* 'every' $=\lambda Q\lambda P\ Vx[Q\{x\}\rightarrow P\{x\}]$

[13] Actually, I assume the possessive particle *uy* 's' to be a distinct category of type(T/PN)/T, which, for the present purpose, can be translated as follows: $\lambda p\lambda Q\ \lambda PP\{F((p)(Q))\}$, where F is a constant of type $\langle\langle s, t\rangle, e\rangle$ which is assigned an identity function (Thomason 1976b: 31, 40). In order to account for phrases such as K_0 *uy kho* 'he$_0$'s nose,' *mica uy kho* 'Mica's nose,' etc., we need to assign the possessive particle *uy* to another category, too; namely, (T/CN)/T.

(26) a. K_0 uy (T/PN) $=\langle\lambda Q\ \lambda PP\{F(^{\wedge}\lambda PP\{x_0\}(Q))\};\ \lambda Q\ \lambda P\ x=x\rangle$

b. mica uy (T/ PN) $=\langle\lambda Q\ \lambda PP\{F(^{\wedge}\lambda PP\{m\}(Q))\}:\ \lambda Q\ \lambda P\ female^{e}(m)\rangle$

Heritage expressions are defined to be the same as the extension expressions.

This treatment of the possessive forms should not sound strange. In the treatment of phrases such as those in (27)

(27) a. John's attitude of defiance towards Bill

b. several of John's proofs of the theorem

Chomsky (1970:196-200) suggests deriving the possessive NP as a base form. Thus, as for the status of possessive noun phrases, the present treatment is in line with Chomsky's suggested analysis. Another rule is formulated in (28).

(28) *New syntactic and translation rule*

S58. If $\beta \in P_{PN}$ (where β is the output of S57a) and $\theta \in P_{T/PN}$ (i.e., possessive), then $F_{58}(\beta, \theta) \in P_T$, where $F_{58}(\beta, \theta)=\theta\beta$.

Ex. [[S] K_0 uy cwucang] 'he$_0$'s claim that [S]'

T58. If β translates (as in T57) to $\langle\alpha^{e}(^{\wedge}\phi^{e});\ \lambda x[\alpha^{i}(^{\wedge}\phi^{e})(x) \wedge \alpha^{h}(^{\wedge}\phi^{i})(x)]\rangle$ and θ translates as in (26), then $F_{58}(\beta, \theta)$ translates to $\langle\lambda PP\{F(^{\wedge}\lambda QQ\{x_0\}(^{\wedge}\alpha^{e}(^{\wedge}\phi^{e})))\};\lambda P[K_0{}^{i}(^{\wedge}\alpha^{e}(^{\wedge}\phi^{e}))\wedge K_0{}^{h}(^{\wedge}\lambda x[\alpha^{i}(^{\wedge}\phi^{e})(x)\wedge\alpha^{h}(^{\wedge}\phi^{i})(x)])]\rangle$.[14]

The heritage expression is defined to be the same as the extension expression.

Ex. [[S] K_0 uy cwucang] 'he$_0$'s claim that [S]' is translated to $\langle\lambda PP\{F(^{\wedge}claim^{e}(^{\wedge}\phi^{e})(x_0))\};\ \lambda P[claim^{i}(^{\wedge}\phi^{e})(x_0) \wedge claim^{h}(^{\wedge}\phi^{i})(x_0)]\rangle$.

F is a constant of type $\langle\langle s, t\rangle, e\rangle$, which is assigned an identity function (Thomason 1976b:31, 40). The transformation in (23) applies to the output of S58 when it contains the pro-form as mentioned in the rule. The translation of the phrase [[S] mica uy cwucang] 'Mica's claim that [S]' can be obtained by replacing $\lambda PP\{x_0\}$ in T58 by $\lambda PP\{m\}$. In order to interpret sentence (1b) we need the postulates given in (29).

(29) a. $claim^{i}=\lambda p\lambda x\ belief^{e}(p)(x)$

b. $claim^{h}=\lambda p\lambda x\ x=x$

c. $bother^{i}=\lambda p\lambda x p\{^{\wedge}\lambda y\ hate^{e}_{*}(y, x)\}$

d. $bother^{h}=\lambda p\lambda x p\{^{\wedge}\lambda z\ z=z\}$

With this preparation, sentence (1b: repeated here for convenience) is derived as in (30: next page) and translated as in (31: next page).

(1b) mica ka tongswu lul coahantanun ku cwucang ka chelswu lul kwelophinta.
SP AcP like the claim SP AcP bother

[14] It can be easily shown how the implicature expression in T58 is obtained from the implicature in T57 and the possessive determiner K_0 *uy*. The implicature expression will turn out to be logically equivalent to $\lambda P[\alpha^{i}(^{\wedge}\phi^{e})(x_0) \wedge \alpha^{h}(^{\wedge}\phi^{i})(x_0)]$.

'The claim that Mica likes Tongswu bothers Chelswu.'

Similarly, sentence (32) is derived as in (33a: next page) and translated as in(33b: next page), which says that each person's fear that an earthquake will occur bothers that person. (Implicature expression is ignored.)

(32) cicin ka ilenantanun ku kongpho ka salam mata kwelophinta.
earthquake SP occur the fear SP person every bother
'The fear that an earthquake will occur bothers everybody.'

In the same way, the sentences in (34)-(35) can be easily derived and translated.

(34) mica ka tongswu lul coahantanun swunca uy cwucang ka chelswu lul
SP AcP like 's claim SP AcP
kwelophinta.
bother
'Swunca's claim that Mica likes Tongswu bothers Chelswu.'

(35) han yesin ka ontanun (ku) kitay ka sonye mata hungpwunsikhinta.
a goddess SP come the expectation SP girl every excite
'The expectation that a goddess will come excites every girl.'

In sentence(34) the specific person is mentioned, the person who makes the claim. The transformation in (23) does not operate in sentence (34). That is, the phrase [[S] swunca uy cwucang] 'Swunca's claim that [S]' cannot be transformed into the phrase [[S] ku cwucang] 'the claim that [S].'[15] Sententence (35) can be treated in the sameway as sentence (32) above.

(30) mica ka tongswu lul coahantanun ku cwucang ka chelswu lul kwelophinta, t,3

mica ka tongswu lul coahantanun ku cwucang, Trf. 1, 0 chelswu lul kwelophi, IV,5

mica ka tongswu lul coahantanun K_0 uy cwucang,T, 58 chelsw, T kwelophi, TV

K_0 uy, T/PN mica ka tongswu lul coahantanun cwucang, PN, 57a

mica ka tongswu lul coahanta, t, 3 cwucang, PN/t

(31) a. Extension expression: $\text{bother}^e\ ((F(^\wedge\text{claim}^e(^\wedge\text{like}^e_*(m,t))\ (x_0))),c)$

b. Implicature expression:

$[\text{belief}^e\ (^\wedge\text{like}^e_*(m,t))\ (x_0) \wedge \text{hate}^e_*(c, F(^\wedge\text{claim}^e\ (^\wedge\text{like}^e_*(m,t))\ (x_0)))]$

[15] When this paper was presented at the NELS IX (Graduate Center, City U. of New York: 11-11-78), it was observed (in the discussion period) that English sentences such as (i) may pose a problem for the present analysis.

(i) The knowledge that John likes Mary bothers Bill.

In (i) the knowledge must be interpreted as Bill's knowledge. It cannot be somebody else's knowledge. Thus, it would be incorrect to derive the noun complement in (i) by the transformation rule in(23). Accordingly, one may conclude that sentence (i) constitutes a counter example to the

(32) cicin ka ilenantanun ku kongpho ka salam mata kwelophinta.
earthquake SP occur the fear SP person every bother
'The fear that an earthquake will occur bothers everybody.'

(33) a. cicin ka ilenatanun ku kongpho ka salam mata kwelophinta, t,3, 0

salam mata,T, 2 cicin ka ilenantanun ku kongpho ka K_0 lul kwelophinta,t, 3

salam, CN cicin ka ilenantanun ku kongpho, T, Trf. 1, 0 K_0 lul kwelophi, IV,6

cicin ka ilenantanun K^0 uy kongpho, T, 58 K_0, T kwelophi, TV

K_0 uy, T/PN cicin ka ilenantanun kongpho, PN, 57a

cicin ka ilenanta, t, 3 kongpho, PN/t

b. $\bigwedge y[person^e(y) \rightarrow bother^e_*((F(^\wedge fear^e(^\wedge\bigvee x[earthquate^e(x) \wedge occur^e(x)])(y)), y)]$

Let us now look at the *sasil* 'fact' construction. It was observed above that the *sasil*-construction does not include a possessive relation, which is included in the *cwucang* 'claim' type constrcutions. This fact leads us to a simple solution about the matter of the *sasil* 'fact' type complements. As suggested above, the phrase [[S] ku sasil] 'the fact that [S]' is treated as a T-phrase derived by S2 (F_1). This T-phrase is translated as in (36). Of course, the word *sasil* 'fact' belongs to the category of CN/t.

(36) a. [[S] ku sasil] 'the fact that [S]'

$=\langle \lambda P\ \bigvee y[\bigwedge x[fact^e(^\wedge\phi^e)(x) \leftrightarrow x=y] \wedge P\{y\}];$

$\lambda P\ \bigvee y[\bigwedge x[fact^e(_\vee\phi^e)(x) \leftrightarrow x=y] \wedge$

$\lambda z[fact^i(^\wedge\phi^e)(z) \wedge fact^h(^\wedge\phi^i)(z)](y)]\rangle$

The heritage expression is the same as the extension expression.

b. *Meaning postulates*

$\bigwedge p \bigwedge x\ [fact^i(p)(x) \rightarrow {}^\wedge p]$

$fact^h = \lambda p \lambda x[^\wedge p]$

(Also refer to meaning postulates given in (29) above.)

Notice that this is an attempt to treat the *fact*-construction without complicating the

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analysis in this paper. Two points can be observd: First, Korean does not have a noun complement comparable to the English one in (i). Thus, in treating Korean complements the above possible counter argument will not cause any problem. Second, let us look at the sentences in (ii).

(ii) a. The knowledge that John likes Mary is widespread.
b. The knowledge that John likes Mary bothers every girl.
c. The knowledge that an earthquake would not occur settled down everybody.

As in the treatment of the Korean sentences in (32) and (35), the possesive solution reached in this paper for the *cwucang* 'claim' type nouns can effectively account for the semantic aspects of the sentences in (ii), by making the noun *knowledge* belong to the *claim* type noun category. The example in (i) can be accounted for by letting the noun *knowledge* belong to two different syntactic categories (cf. fn. 7 above). Therefore, the present analysis can account for the sentence in (i), and it is not a serious counter example.

syntactic or semantic parts of the grammar (cf. Delacruz 1976). The meaning postulate (36b, first line) is similar to Delacruz's (1976 : 189) formulation. Under this analysis, sentence (1a: repeated here for convenience) is derived and translated as in (37).

(1a) mica ka tongswu lul coahanun ku sasil ka chelswu lul kwelophinta.
SP AcP like the fact SP AcP bother
'The fact that Mica likes Tongswu bothers Chelswu.'

(37) a. mica ka tongswu lul coahanun ku sasil ka chelswulul kwelophinta, t, 3

mica ka tongswu lul coahanun ku sasil, T, 2 chelswulul kwelophi, IV, 6

mica ka tongswu lul coahanun sasil, CN,57b chelswu, T kwelophi, TV

sasil, CN/t mica ka tongswu lul coahanta, t, 3

b. mica ka tongswu lul coahanun ku sasil'
'the fact that Mica likes Tongswu'

$$=\langle \lambda P\ Vy[\Lambda x[fact^e({}^\wedge like^e_*(m,t))(x) \leftrightarrow x=y] \wedge P\{y\}];$$
$$\lambda P\ Vy[\Lambda x[fact^e({}^\wedge like^e_*(m,t))(x) \leftrightarrow x=y] \wedge$$
$$[fact^i\ ({}^\wedge like^e_*\ (m,t))(y) \wedge fact^h\ ({}^\wedge know^e_*\ (m,t))(y)]]\rangle$$

c. translation of the whole sentence:

$$\langle Vy[\Lambda x[fact^e({}^\wedge like^e_*(m,t))(x) \leftrightarrow x=y \wedge bother^e_*\ (y,c)];$$
$$[Vy[\Lambda x[fact^e({}^\wedge like^e_*(m,t))(x) \leftrightarrow x=y] \wedge$$
$$[fact^i({}^\wedge like^e_*\ (m,t))(y) \wedge fact^h({}^\wedge know^e_*(m,t))(y)]] \wedge$$
$$Vy[\Lambda x[fact^e({}^\wedge like^e_*(m,t))(x) \leftrightarrow x=y \wedge hate^e_*(c,y)]]]\rangle$$

The meaning postulate in (36b) will make the expression $fact^i\ ({}^\wedge like^e_*(m,t))(x)$ denote the true proposition expressed by the sentence *mica ka tongswu lul coahanta* 'Mica likes Tongswu.' The same meaning postulate does not apply to the *cwucang* 'claim' type complements. Thus, the factiveness distinction is indicated in the implicature expression.

In relation to the factiveness, let me consider another point. Look at the sentence in (38).

(38) mica ka tongswu lul coahanun (ku) *kes* ka chelswu lul kwelophinta.
SP AcP like the SP AcP bother
'(The fact) that Mica likes Tongswu bothers Chelswu.'

In (38) the word *sasil* 'fact' is transformed into a pro-form, which is traditionally called a dependent pro-form in the sense that it is meaningless as an independent word. I do not see any semantic difference between sentences (1b) and (38). This syntactic phenomenon, I think, can be easily accomodated by setting up a transformation-like rule of pro-formation.

In the present analysis, the two sentences in (39) are not syntactically related.

(39) a. chelswu ka mica ka tongswu lul coahanun ku sasil lul insikhanta.
SP SP AcP like the fact AcP realize
'Chelswu realizes the fact that Mica likes Tongswu.'

b. chelswu ka mica ka tongswu lul coaha um lul insikhanta.
SP SP AcP like CMP AcP realize
'Chelswu realizes that Mica likes Tongswu.'

Nonetheless, that both of them are factives is captured in terms of their implicature expressions. The meaning postulated in (36b) will insure that the formula $fact^i(p)(x)$ denotes a true proposition [^{V}p] in the implicature expression of sentence (39a). The formula [^{V}p] will also be included in the implicature expression of sentence (39b).

Let us look at another set of noun phrases in (40).

(40) a. [[na uy aki ka wul nun] (ku) soli]
I 's baby SP cry the sound
'the sound that my baby cries=the sound of my baby's crying'

b. [[na uy aki ka wus nun] (ku) moyang]
I 's baby SP laugh the manner
'the manner that my baby laughs=the manner of my baby's laughing'

c. [[mica ka casalhan] (ku) saken]
SP kill-herself the incident
'the incident that Mica killed herself'

These constructions are not relative clauses, since there is no deleted noun phrase in the embedded sentence. At first sight, these seem to be a little different from the noun complements of the sort discussed in this paper, because the head nouns are different. A closer look at them (due to discussions with Stanley Peters), however, reveals that these should actually belong to the category of the *sasil* 'fact' type noun complements. The syntactic derivation of the *sasil* 'fact' complements is equally operative for the noun complements in (40). Intuitively, they share the same semantic aspects with the *sasil* 'fact' complements. The pro-formation rule (shown in (38)) is applicable to these constructions, too. (In this paper, I do not deal with the possible ambiguity resulting from the pro-formation rule.) Thus I treat the noun complements in (40) as members of the *sasil* 'fact' type complements. Now, the data in (40) can be easily accounted for by postulating the nouns *soli* 'sound,' *moyang* 'manner,' and *sako* 'incident' as members of the syntactic category CN/t, and by generalizing the meaning postulates in (36b) so that they can also apply to the complements is (40).

4. Discussion

To return to the sentences in (1b) and (34), one may not be convinced by the rules given in (28) for the *cwucang* 'claim' type complements. Specifically, one may question the validity of the possessive-solution to the structure [[S] ku cwucang] 'the claim

that [S].' One may argue that this and the *sasil* 'fact' type complements can be distinguished purely in terms of the implicature expressions and hence that we need not introduce the possessive determiner. As far as the phrase [[S] ku cwucang] 'the claim that [S]' is concerned, we may get by with this alternative. The solution reached in this paper, however, has the following advantage: First, the complements in the sentences in (1b) and (34) can be represented as in (41).

(41) a. (1b) [[S] ku uy cwucang] 'the claim that [S]'
b. (34) [[S] swunca uy cwucang] 'Swunca's claim that [S]'

(42) a. (for 41a) $\lambda PP\{F(^{\wedge}claim^{e}\ (^{\wedge}\phi^{e})\ (x_0))\}$
b. (for 41b) $\lambda PP\{F(^{\wedge}claim^{e}\ (^{\wedge}\phi^{e})(s))\}$

In the present analysis, the semantic similarity between (41a) and (41b) can be more effectively captured. The extension expresion of (41a) will turn out as (42a), which contrasts with that of (41b), i.e., (42b).

Also, in terms of the translations given for the *cwucang* 'claim' type noun complements we can effectively capture the semantic similarity between the two phrases in (43).

(43) a. mica ka tongswu lul coahantanun swunca uy cwucang
SP AcP like 's claim
'Swunca's claim that Mica likes Tongswu'

b. mica ka tongswu lul coahanta ko swunca ka cwucanghanta.
SP AcP like CMP SP claim (v.)
'Swunca claims that Mica likes Tongswu.'

Furthermore, a piece of indirect evidence for the present analysis can be found in a language such as Classical Arabic (data from Kamal Abdul-Ghany). Look at the sentences in (44) and (45).

(44) a. John sahlun ʾan tordiya-*hu* (Regular)
be-easy to please him
'John is easy to please.'

b. John sahlun ʾirdaʾu-*hu* (Nominalized)
be-easy please him

c. John sahlu *ʾal* ʾirḍāʾ. (Nominalized)
be-easy the please

(45) a. Mary jamilalun wajhu-*ha*.
be-beautiful face her
'Mary, her face is beautiful.'

b. Mary jamilatu *l*-wajhi.
be-beautiful the face
'Mary, the face is beautiful.'

The English gloss 'please' in (44 b&c) may better be represented as 'pleasing.' The point is that both sentences (44b) and (44c) are equally translated as *John is easy to please.* The pro-form *hu* 'him' in (44b), although it is not a subject, is transformed into a defi-

nite article *ʔal* 'the' in (44c). From this we can say that in Arabic there is a transformation which transforms a pro-form into a definite article. In (45) we see a transformation of a possessive pro-form *ha* 'her' into *l* 'the.' This syntactic phenomenon in Arabic may indirectly support the possessive solution for the *cwucang* 'claim' type noun complements in Korean.

Let me now discuss potential problems in the present analysis. Let us consider the filtering problem which may arise in connection with the conventional implicature of the complements. Look at the sentences in (46).

(46) a. mica ka chelswu lul coahanun ku sasil ka pwunmyenghata.
SP AcP like the fact SP be-obvious
'The fact that Mica likes Chelswu is obvious.'

b. ?*mica ka chelswu lul coahanun ku sasil ka ani pwunmyenghata.
SP AcP like the fact SP not be-obvious
'?The fact that Mica likes Chelswu is not obvious.'

To me the Korean sentence in (46b) is ungrammatical. One of my informants, however, says that it may be interpreted as meaning (47).

(47) It is not obvious (to me) whether or not Mica likes Chelswu.

I fail to get this reading from the Korean sentence in (46b). Although very unnatural, if it is grammatical, it may be interpreted as meaning (48).

(48) The underlying motive of the fact that Mica likes Chelswu is not obvious.

Anyway, if the Korean sentence in (46b) is grammatical as one of my informants suggests and if it can be interpreted as something like (47), then the factive implicature should be cancelled. This would pose a problem for the present analysis, since the word *pwunmyngha* 'be-obvious' is a hole predicate. One way out would be to reflect the notion of factiveness in the extension expression. This solution, however, would be insufficient in accounting for sentences such as (39b), which does not have the word *sasil* 'fact.'

As observed to me by Stanley Peters (personal discussion), sentence (49) may pose a problem for the present analysis.

(49) *mica ka tongswu lul coahantanun swunca uy sasil ka chelswu lul
SP AcP like 's fact SP AcP
kwelophinta.
bother
'*Swunca's fact that Mica likes Tongswu bothers Chelswu.'

As shown in (19b) the word *sasil* 'fact,' which takes a sentence, belongs to the category CN/t. After combining with a sentence (by Rule S57b), the result would be a CN phrase. In the present analysis a basic expression of the category CN is assumed to combine with a possessive noun phrase as shown in (50).

(50) mica uy, $_{T/CN}$+kho $_{CN}$→ mica uy kho $_{T}$ 'Mica'snose'

The problem is: How can we keep the output of S57b from combining with a possessive determiner (i.e., category T/CN)? As a tentative solution, in this case we can make the relevant syntactic rule be sensitive to the distinction between derived and basic members of the category CN. By so doing the derivation of ungrammatical sentences such as (49) can be syntactically blocked.[16]

To conclude, I hope to have shown the effectiveness of a Montague type model theoretic semantics in providing an explicit formal interpretation of sentential complements of nouns in Korean.

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[16] However, this could not be the end of the story. Winfred Lehmann (personal communication) observed to me that, as a technical expression, the English version of sentence (49) should be grammatical. With the Korean sentence I agree with him. In this sense, however, the subject noun complement in sentence (49) seems to be ambiguous, between (ia) and (ib), for instance. (For convenience, English versions are given.)

(i) a. Swunca obtained the fact that Mica likes Tongswu. (say, as a result of an investigation)
b. Swunca knows the fact that Mica likes Tongswu.

Thus, for this reading, we may treat the complement as a reduced version of the sentences in (i). However, I am not claiming that this is the only solution, and I hope a further study will shed light on this unclear point.

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