

# More on Content Clauses\*

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## 1. Introduction

In the article, "Content Clauses in English" (1975), I claimed that the notion of *conceptualization process* should be taken into account for syntactic and semantic analysis. This basic claim has not been changed. But the 1975 paper should be revised with respect to two points. One is some errors in dealing with crucial data. The other is that a special 'semi-English' expression, namely, the *such-that* construction, which was outside of the 1975 paper, should be dealt with. So far no linguist's attention has been paid to this special construction. The question is whether this construction is a relative clause or a content clause. Another matter of curiosity is the nature of the word *such* and whether or not it is a head noun of a content clause.

The two constructions, relative clause and content clause, are apparently similar in that both have the canonical form of "head noun + connector + clause":

- (A) the book — that — Jim bought  $\phi$  yesterday (is interesting)
- (B) the fact — that — Jim bought it yesterday (surprised me)

Another similarity is that the *that-clause* in both constructions may be regarded as modifying the head noun. In (A), the head noun, *the book*, is modified/specified by the *that-clause*, and in (B) the head noun, *the fact*, is

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modified/specified by the *that*-clause. Nonetheless, the two constructions are quite different. In (A), the head noun is coreferential with one element of the *that*-clause; whereas, in (B), the head noun is not coreferential with any one element of the *that*-clause, rather the head noun is *co-sensial* with the *that*-clause itself.<sup>1</sup> That is, in (B), the head noun gets its semantic information from the *that*-clause. Thus, the two constructions are syntactically and semantically different: in (A) *that*-clause is a relative clause, and in (B) *that*-clause is a content clause. The term *content clause* is due to Jespersen (1964: 349-351). Earlier, I used the term *appositive complement* (cf. Yang, 1972: 224-255) but my 1975 paper used *content clause*, following Jespersen.

The remainder of this paper is organized as follows. Section 2 categorizes head nouns according to their semantic interactions with their content clauses. Section 3 explores the source and the nature of head nouns — Where do head nouns come from? And what kind of nouns can be head nouns? Section 4 discusses the semi-English expression, the *such-that* construction. Here the argument is concerned with whether the *such-that* construction is a relative clause or a content clause, and with the nature of the word *such*. Section 5 summarizes the main points of this study.

## 2. Types of Head Nouns

Content clauses are necessarily preceded by head nouns. As pointed out in the 1975 version, head nouns are categorized into three types according to the semantic relation between head nouns and their content clauses. They are (i) affirmative head nouns, (ii) pseudo-negative head nouns, and (iii) negative head nouns.

First, the following examples contain affirmative head nouns.

### (1) *Affirmative Head Nouns*

- a. Jim made *the claim* that the earthquake was causing the accidents.
- b. There is strong *evidence* that such a theory cannot account for sig-

<sup>1</sup> The terms *co-sense* and *co-sensial* are the author's coinage, following the analogy of *co-reference* and *co-referential*.

nificant linguistic phenomena.

- c. I will adopt *the idea* that semantics based on understanding is superior to semantics based on truth conditions.

The head nouns (italicized) in these examples are affirmative in the sense that their lexical meanings are affirmative and do not negate their content clauses. The semantic relation between the head noun and its content clause can be expressed by the copula:

- (2) a. *The claim* is that the earthquake is causing the accidents.  
 b. *The evidence* is that such a theory cannot account for significant linguistic phenomena.  
 c. *The idea* is that semantics based on understanding is superior to semantics based on truth conditions.

The semantic content of the head noun, *the claim*, for example, is equivalent to the semantic content of its content clause, *the earthquake is causing the accidents*. They are *co-sensial*. The content clause (= a proposition) is conceptualized by the cognizer as a *claim* in (2a). The same proposition may be differently conceptualized. For example, the head noun in (2a) may be the *rumour*, the *realization*, the *fact*, ..., or the *report*. (This will be discussed in section 3.)

Second, the following examples contain pseudo-negative head nouns.

(3) *Pseudo-negative Head Nouns*

- a. Jim raised (against Paul) *the objection* that GB syntax is based on universal principles and language-particular parameters.  
 b. Jim supports *Bill's rebuttal* (against Paul) that the use of nuclear weapons can win the war.

By pseudo-negative head nouns, I mean that the interpretation of the content clause is not negative, although non-native speakers of English might tend to interpret the content clause negatively due to the semantic content of the head noun. In (3a), Jim *objects to* Paul's opinion, but not to the content clause. Jim asserts that GB syntax is based on universal principles and language-particular parameters. In other words, Jim is against Paul, with his assertion of the content clause. In (3b), Bill rebuts against Paul with his assertion of the content clause; Bill asserts that the use of nuclear weapons can win the war. Here also, non-native speakers of English might tend to

interpret *Bill's rebuttal* as “the use of nuclear weapons can NOT win the war,” mistakenly influenced by the head noun, *rebuttal*.

Here also, head nouns and their content clauses may be linked by the copula:

- (4) a. *The objection* is that GB syntax is based on universal principles and language-particular parameters.
- b. *Bill's rebuttal* is that the use of nuclear weapons can win the war.

The linkability of head nouns and their content clauses by the copula suggests that head nouns and their content clauses stand in the appositive relation. This will be discussed below.

My 1975 version regarded *opposition* as a pseudo-negative head noun. But that was a mistake. The noun *opposition* does not function as a head noun, as shown in the following:

- (5) a. \*Jim supports *Bill's opposition* that wives should obey their husbands.
- b. \**Bill's opposition* is that wives should obey their husbands.

Native speakers of English just do not accept these sentences. The difference between *objection*, *rebuttal* on one hand and *opposition* on the other is reflected in the difference of the corresponding verbs' compatibility with sentential complements:

- (6) a. Jim *objects* that GB syntax is based on universal principles and language-particular parameters.<sup>2</sup>
- b. Bill *rebutted* that the use of nuclear weapons could win the war.
- c. \*Bill *opposed* that wives should obey their husbands.

Verbs *object* and *rebut* subcategorize for sentential complements as their objects. Verb *oppose*, in contrast, does not. Pseudo-negative head nouns are quite limited in number.

Third, the following examples contain negative head nouns.

<sup>2</sup> Verbs *object* and *object to* must be distinguished:

- (i) I *object* that Jim is honest.
- (ii) I *object to* Susan's claim that Jim is honest.

In (i), I assert that Jim is honest. In (ii), in contrast, I assert that Jim is NOT honest. *Object* subcategorizes for a sentential complement; *object to* subcategorizes for a noun, but not a sentential complement.

(7) *Negative Head Nouns*

- a. Jim's *denial* that men are superior to women (is reasonable).
- b. Jim's *doubt* that the energy crisis will disappear (is reasonable).
- c. Jim's *misconception* that philosophy is a higher discipline than linguistics (will lead to such a conclusion).

The head nouns in (7) carry negativity of some sort, which negates their content clauses. In (7a), Jim denies the semantic content of the content clause: Jim asserts that men are NOT superior to women. In (7b), Jim asserts that the energy crisis will NOT disappear. In (7c), Jim asserts that philosophy is NOT a higher discipline than linguistics. Note that verbs *deny* and *doubt* on the one hand and *misconceive* on the other behave differently: (This will be further discussed below).

- (8) a. Jim *denies* that men are superior to women.
- b. Jim *doubts* that the energy crisis will disappear.
- c. \*Jim *misconceives* that philosophy is a higher discipline than linguistics.

Verbs *deny* and *doubt* subcategorize for sentential complements as their objects. But *misconceive*, in contrast, does not.

My 1975 version regarded the noun *negation* as a negative head noun. But that was a mistake:

- (9) a. \*Bill's *negation* that the present world is chaotic (is groundless).
- b. \*Bill *negates* that the present world is chaotic.

Native speakers of English just do not accept these sentences. At that time, my inclusion of this noun in the category of negative head nouns was due to the analogy with my own language.

One may regard the noun *misunderstanding* as a negative head noun. But this noun is dubious.

- (10) a. %Jim's *misunderstanding* that the moon is bigger than the sun (will lead to a strange conclusion).
- b. %Jim *misunderstands* that the moon is bigger than the sun.

Here '%' indicates idiolectal variation. Most native speakers of English do not accept these sentences, although these sentences are interpretable at

the conceptual level. Naturally, those who accept (10) also accept (7c), but not *vice versa*. It is not clear to me how *misconception* and *misunderstanding* are different in regard to their possibility of acting as head nouns.

To summarize, the head nouns of content clauses are categorized into three types: affirmative, pseudo-negative, and negative, according to the negatability of the content clause by the semantic nature of head nouns. Negative head nouns include *denial*, *doubt*, *misconception*, but exclude *negation*, and in between stands *misunderstanding*. Pseudo-negative head nouns include *objection*, *rebuttal*, but not *opposition*. Affirmative head nouns include most nouns which can function as head nouns. (This will be discussed below.) Nonnative speakers of English are very likely to mistakenly believe that pseudo-negative head nouns belong to the category of negative head nouns.

### 3. Where Do Head Nouns Come from?

This section explores the source of head nouns of content clauses. My 1975 version held that head nouns are derived from main verbs through nominalization, as in (11-12):

- (11) a. Jim *believes* that God helps those who help themselves.  
 b. *Jim's belief* that God helps those who help themselves (is generally shared by others).  
 c. *The belief* that God helps those who help themselves (is generally shared by others).
- (12) a. (Somebody) *reported* that Jim left for Seoul to meet with high officials.  
 b. I've got *the report* that Jim left for Seoul to meet with high officials.

In (11), Jim believes the content of the sentential complement (a proposition). This becomes *Jim's belief* of that proposition through nominalization. *Jim's belief* may become *the belief* through definitization. Likewise, in (12), somebody reported the sentential complement (a proposition). This becomes *somebody's report* of that proposition through nominalization. *Somebody's report* may become *the report* through definitization. This hypothesis, *the verb-*

*noun correspondence hypothesis*, can account for the pairs in (11-12).

However, there are examples which challenge the verb-noun correspondence hypothesis. There are many head nouns which lack their cognate verbs:

- (13) doctrine, evidence, fact, idea, notion, policy, problem, property, tenet, thesis, ...

If we adopt the verb-noun correspondence hypothesis, we cannot account for the potential head nouns such as in (13). Furthermore, there are cases in which the hypothesis does not work smoothly, although the head noun has its cognate verb. A case in point is the examples (7c, 8c); here repeated as (14).

- (14) a. \*Jim *misconceives* that philosophy is a higher discipline than linguistics.  
 b. Jim's *misconception* that philosophy is a higher discipline than linguistics (will lead to such a conclusion).

In (14b), we have the head noun *misconception*, which has its cognate verb *misconceive*. But this verb does not subcategorize for a sentential complement (which is a potential content clause), as shown in (14a). Thus, we can conclude that the verb-noun correspondence hypothesis cannot serve as the uniform source of head nouns.

In order to avoid this difficulty (cf. 13), Hurford (1973: 280-283) proposes a dual treatment. He refers in passing to the deep structure of content clauses. If his idea is carried to its logical conclusion, his contention may be interpreted as proposing that the source of content clauses (and their head nouns) cannot be homogeneous. In the case where the head noun has its cognate verb, he applies the verb-noun correspondence hypothesis. In the case where the head noun lacks its cognate verb (cf. 13), he relies on a different treatment: the head noun and its content clause are regarded as forming a relativized NP, with the relative clause having "S is a fact/principle/tenet/...". This dual approach cannot capture a generalization and involves redundancy. The reason is that the structure "S is a noun" can also be applied to the case where the head noun has its cognate verb, like "S is a belief/claim/report/...".

Another effort to avoid the difficulty (cf. 13) was attempted by Hochster (1974). For the case where the noun lacks its cognate verb, she radically proposes that the head noun *fact*, for example, has its hypothetical semantic predicate *fact*. If this radical proposal turns out to be adequate, she can capture the generalization to the effect that all the head nouns with or without surface verbs can be accounted for by the single verb-noun correspondence hypothesis. However, her hypothesis that all nouns have their semantic predicates is extremely hard to justify.

Now our search for an alternative is in order. For this, I propose the *conceptualization hypothesis* (cf. Yang, 1975). Consider the following discourse:

- (15) a. Speaker A (Adam, locutionary source):  
 Philosophy is a higher discipline than linguistics.
- b. Speaker B (Bill, reporter of (a)):  
 Adam says that philosophy is a higher discipline than linguistics.
- c. Speaker C (Charles, cognizer of (a)):  
 Adam's thought/belief/idea/hypothesis/claim/tenet/postulate/assumption/assertion/knowledge/realization/conviction/misconception/...that philosophy is a higher discipline than linguistics (is groundless).

Suppose a discourse context (15), in which Adam as a locutionary source utters a proposition (15a); Bill as the reporter of (15a) reports (15b); and Charles as the cognizer (=the conceptualizer) of (15b) conceptualizes (15a) as (15c). In (15b), Bill sets up Adam's locution as a proposition. In (15c), Charles assigns Adam's propositional attitude to the proposition, through his (=Charles') own conceptualization. In this discourse context, Adam and Bill do not make any commitment as to Adam's propositional attitude toward Adam's locution. Only Charles makes a concrete commitment. Here Charles has to decide whether the proposition (=the sentential complement=the content clause) is Adam's thought/belief/idea/..., or misconception. Charles has to choose one out of all the possible concepts which match the given proposition. This process is referred to as the *conceptualization process* in this study. In the context (15), the proposition is constant whereas the conceptualization of it varies. It cannot be objective, but only subjective. This means that a specific propositional attitude (which

becomes a specific head noun of a content clause) cannot be assigned to a specific proposition until the conceptualizer's (=cognizer's) decision is made. Once a specific propositional attitude is assigned to a given proposition (which becomes a content clause), the head noun (which is the linguistic realization of the propositional attitude) is settled. Thus, head nouns of content clauses come from the conceptualizer's *conceptualization process*.

At this point of our discussion, let me digress a little bit. According to Wierzbicka (1990: 102-103), color perception is, by and large, the same for all human groupings; but color conceptualization is different in different cultures. She attributes this difference (of color perception and color conceptualization) to the difference of "brain" and "mind", brain being shaped by our common human biology and mind being shaped, partly, by our particular culture. As for Chomsky, he does not distinguish between brain and mind in his recent work (e.g. 1986); he uses a slash between them, e.g. brain/mind. It is a puzzle whether brain and mind are *located* in the same place or in the separate places of the body. What concerns us here is whether or not conceptualization in general is specific to cultures, as Wierzbicka claims. It seems to me that her claim cannot be generalized to all categories. For instance, the conceptualization of a given proposition cannot be culture-specific. Individuals, irrespective of culture, may conceptualize a given proposition differently or similarly, depending on the context.

From the cognitive view adopted in this study, the head noun is the linguistic realization of the cognizer's propositional attitude toward the given proposition (=the content clause). This process does not require the syntactic process such as the *verb-noun correspondence process* (e.g. nominalization process). The conceptualization process can accommodate asymmetric as well as symmetric cases. In other words, this cognitive approach can naturally account for the difficulties pointed out above, namely, (i) the case in which certain potential head nouns lack their cognate verbs (cf. 13), and (ii) the case in which the head noun has its cognate verb, but the verb does not subcategorize for a sentential complement (cf. 14). Note that most potential head nouns have their cognate verbs. This fact raises a natural question of whether such a correspondence is accidental. Such a symmetry is a consequence of the perfect linguistic realization of the conceptualization process. In contrast, an asymmetry (i.e., head nouns which lack their cognate verbs) is a consequence of imperfect linguistic re-

alization of the conceptualization process. This suggests that natural language is not rich enough to exactly match mental conceptualization. Such a gap between mental structure and linguistic structure may be filled up, in such a way that language manages to catch up with the mental structure. One important example of such efforts is the *such-that* construction which will be discussed in section 4.<sup>3</sup>

Note that the conceptualization process as in (15) is a typical case. There may be cases in which the process can be shortened; for instance, speaker A (=the locutionary source) may play speaker B's and speaker C's roles at the same time. In this case, the locutioner functions as the conceptualizer, and the locutioner sets up a proposition and assigns a specific propositional attitude (=a specific head noun) of his own choice to his proposition (=the content clause). For example, the locutioner may utter: 'My/The belief that the pen is mightier than the sword...', in which the content clause is *the pen is mightier than the sword*, which is conceptualized as *his/the belief* by himself.

Now I will clarify the status of the word *that* which necessarily occurs between the head noun and its content clause. I regard it as an appositive connector, which means that the head noun and its content clause are in the appositive relation with regard to *sense* (cf. section 1). Syntactically, *that* is the sentential complementizer, and the content clause is the sentential complement.

At this point, the relationship between head nouns and their content clauses deserves semantic clarification. Head nouns themselves carry certain lexical semantic information. For example, a potential head noun '*the idea*' has its own semantic information. However, this noun lacks any clear semantic information. Listeners, when encounter this noun, will immediately become curious about "What is the 'concrete' semantic information of '*the idea*'?". That is, the semantic information of *the idea* is very vague (except perhaps for categorial information, i.e., an abstract mental noun). In order to fill out this semantic vagueness, the content clause is mandatory, that is, the content clause provides the concrete semantic information for its head noun. In a nutshell, the function of the head noun is to represent

<sup>3</sup> The gap between cognitive and linguistic structure may also be filled up by metaphor and metonymy. cf. Lakoff (1987), Lakoff and Johnson (1980), Lakoff and Turner (1989), among others.

the cognizer's propositional attitude toward the given proposition (=the content clause), whereas the function of the content clause is to provide the concrete semantic information for its head noun. Thus, the semantic relationship between them can be represented by the linking copula, which represents the *co-sense*:

- (16) a. I will adopt *the idea* that semantics based on understanding is superior to semantics based on truth conditions. (= 1c)  
 b. *The idea* is that semantics based on understanding is superior to semantics based on truth conditions.
- (17) a. Jim raised (against Paul) *the objection* that GB syntax is based on universal principles and language-particular parameters. (= 3a)  
 b. *The objection* is that GB syntax is based on universal principles and language-particular parameters.
- (18) a. *Jim's denial* that men are superior to women is unreasonable.  
 b. *Jim's denial* is that men are superior to women.

In these examples, (a) sentences contain head nouns and their content clauses; and in (b) sentences, head nouns are linked to their content clauses by the copula. (b) sentences show that the concrete semantic information of the head noun is contained in the content clause. The head noun '*the idea*' in (16) is an affirmative head noun; the head noun '*the objection*' in (17) is a pseudo-negative head noun; and the head noun '*the denial*' in (18) is a negative head noun. The semantic interpretations of the above sentences are different due to the different categories of head nouns. In the case of affirmative and pseudo-negative head nouns, the content clause is NOT NEGATED by the head noun. In the case of negative head nouns, by contrast, the content clause is NEGATED by the head noun. These different interpretations are clearly represented by the (b) sentences in (16-18), where head nouns and their content clauses are linked by the copula.

Traditional school grammars noted that the head noun and its content clause are *appositives*. I (Yang, 1972: 241-255) indicated that the head noun and its content clause are appositives, and that the content clause is the appositive complement. My 1975 paper used the term *content clause* instead of *appositive complement*. This terminological shift, however, does not mean that the notion of *appositive complement* is out of place. It is true that

the relationship between the head noun and its content clause is an appositive one. This fact is confirmed by the following examples:

- (19) a. The cluster has the fundamental property of a gestalt, *namely*, that the entire cluster is easier to comprehend than its individual parts or any collection of them. (Lakoff, 1987: 203)
- b. In the late 1960s, a disturbing discovery was made, *namely*, that sentences exist in which two pronouns are each contained in the other's antecedent: "The boy who wanted it got the prize that he deserved." (McCawley, 1988: 327)

In (19a), the head noun 'the fundamental *property* of a gestalt' is linked, by the word NAMELY, to its content clause (=that complement). Likewise, in (19b), the head noun 'a disturbing *discovery*' is linked, by the word NAMELY, to its content clause (=that complement). The word *namely* clearly shows that the head noun and its content clause are appositives, which are equivalent to *co-sense* used in this study.

Still another curious phenomenon is the nature of the whole category of potential head nouns, that is, the kind of nouns that can function as head nouns. Our immediate intuition suggests that not all nouns can be head nouns. For example, 'tree', 'cow' or 'sky' cannot be a head noun at all in any context. Why is this? As already indicated, head nouns are linguistic realizations of cognizer's propositional attitudes toward given propositions. Concrete and non-cognitive nouns such as 'tree', 'cow' and 'pen' can never be propositional attitudes. Thus, only nouns which can express propositional attitudes can be potential head nouns; they are abstract and cognitive nouns. This implies that autonomous syntax cannot naturally account for the incompatibility of the combination "concrete, non-cognitive noun + content clause", e.g., \**the tree* that life is short and art is long'.

One might worry about the category of negative head noun, in connection with my claim that the concrete semantic information comes from its content clause. For example, consider the expression, 'the hypothesis that water can boil at 10 degrees C'. The concrete semantic information of the head noun, *the hypothesis*, is: water can boil at 10 degrees C. Here we have no problem. In contrast, consider the expression, 'the denial that water can boil at 10 degrees C'. If we follow the above process exactly, the concrete semantic information of the head noun, *the denial*, is: water can boil at 10

degrees C. This immediately leads to a serious contradiction, because the true semantic interpretation of that expression is: water can NOT boil at 10 degrees C. In order to avoid this seeming contradiction, one might want to adopt the verb-noun correspondence hypothesis (discussed above) for the correct semantic interpretation of negative head nouns. If we adopt this correspondence hypothesis, the correct semantic interpretation of negative head nouns is straightforward, because this hypothesis naturally allows the process of 'somebody *denies* that water can boil at 10 degrees C'. But we have already pointed out that this hypothesis loses a significant generalization, because it cannot account for the case in which head nouns lack their cognate verbs (cf. 13). Interestingly enough, the contradiction under consideration raises no problem for the conceptualization process hypothesis advocated in this study, because this hypothesis allows the appositeness between the head noun and its content clause, that is, the structure of (b) sentences in (16-18). Take (18b), for example: 'Jim's *denial* is that men are superior to women'. This structure naturally provides us with the correct semantic interpretation: men are NOT superior to women. Likewise, 'the denial that water can boil at 10 degrees C' can get its correct semantic interpretation through the structure: 'the *denial* is that water can boil at 10 degrees C', that is, 'water can NOT boil at 10 degrees C'.

To sum up, the source of head nouns cannot be found in the syntactic perspective; rather, it can be found in the cognitive perspective. The source of head nouns is the cognizer's conceptualization process. The determination of a specific head noun for a given proposition depends on the cognizer's propositional attitude toward a given proposition. A natural consequence of the conceptualization process hypothesis is that the potential candidate nouns for head nouns are limited to abstract and cognitive nouns which are compatible with the cognizer's propositional attitudes. All of this suggests that syntactic analysis calls for cognitive perspectives as well.<sup>4</sup>

<sup>4</sup> Some works of cognitive linguistics are indicated at the end of section 5.

#### 4. The *such-that* Construction

Consider the following examples which are directly quoted from linguistics literature:

- (20) Thus this second formulation  $[(\forall x)(Dx \supset Wx)]$  may be translated most directly into semi-English as ‘Everything is *such that*, if it is a duck, then it waddles’.  
(Martin, 1987: 127)
- (21) The logical structure of (4) is *such that* it does not allow the substitution of the expression ‘the evening star’ for ‘Hesperus’.  
(G. W. Fitch, 1987, *Naming and Believing*, p. 107)
- (22) These principles of compositional semantics are *such that* speakers do not in general need to know in advance the meaning of complex structures (i.e., phrases and sentences); rather, the meaning of such larger structures simply follow from the knowledge of forms and rules that speakers have to know independently.  
(Fillmore, *et al.*, 1988, Regularity and Idiomaticity in Grammatical Constructions, *Language* 64/3, p. 502)
- (23) Anaphora is the relationship between two linguistic expressions X and Y, *such that* Y gets interpretation from the interpretation of X.  
(Fillmore, 1988: 283)
- (24) Here (=123) there seems to be no natural interpretation in which feeding and preparing can be imagined to represent points on one dimension and children and lectures as points on another dimension *in such a way that* the propositions expressed in (124-127) are not only sensible but presupposed.  
(Fillmore *et al.*, 1988: 531)

The *such-that* construction is a ‘semi-English’ expression as pointed out in example (20), which was invented and began to be used by logicians. This invention was made in order to fill the gap which existed between conceptual structure and syntactic structure. This is a case which exemplifies the proverb “Necessity is the mother of invention”. Since this construction is now generally used in academic circles, it deserves our concern and the proper analysis. My guess is that this construction will be generally used in the future, since the gap between conceptual and syntactic structure will

not remain vacant.

The first point to be clarified is whether the *such-that* construction is a relative clause or a content clause. If the construction is a relative clause, it must meet (i) the requirement that one element of the *that*-clause must be coreferential with the purported head noun *such*, and (ii) the condition that the purported relative pronoun *that* may be replaced by another relative pronoun *which*. But the *such-that* construction does not meet these conditions. This leads us to conclude that it is not a relative clause. In contrast, if this construction is a content clause, it must meet (i) the requirement that it have a head noun, and (ii) the condition that no element of *that*-clause is coreferential with the head noun. Since this construction meets these conditions, it is safe to conclude that the *such-that* construction is a content clause.

The second point to be clarified is the nature of the head noun *such*. This head noun is quite different from the rest, in that *such* is not a normal noun but a pro-form; unlike normal nouns *such* does not have its own semantic content. *Such* is an anaphor in the sense that it gets interpretation from *that-complement*. Fillmore (1988) defines anaphora as in (23) above, and provides the following three types (pp. 284-286):

(25) a. *identity-of-reference anaphora*

As soon as the girl saw the puppy, *she* picked it up.

b. *identity-of-sense anaphora*

As soon as the girl saw the puppy, she decided that she wanted *one* too.

c. *zero anaphora*

When I saw your puppy, it reminded me of Harry's  $\phi$ .

Similarly, McCawley (1988: 319) defines anaphoric devices as: "words or expressions that take their interpretation from some other part of the sentence or discourse." He provides the following examples:

(26) a. Mary said that *she* was angry. (pronoun)

b. John pitied *himself*. (reflexive)

c. Your brother is always insulting *other* people. (*other*)

c'. Your brother is always insulting everyone *else*. (*else*)

d. If your brother insults me again, I'll punch *the bastard* in the nose. (epithet)

- e. Fred says that there are politicians *who don't accept bribes*, but I strongly doubt that there are any *such* politicians.<sup>5</sup> (*such*)
- f. Mary said that Roger was an idiot, but I'm sure she doesn't think so. (*so*)
- g. Janet drives a small car and Alex drives a big *one*. (*one*)

Among the various anaphoric types, what is of special interest with regard to our discussion is the example (26e), which contains the word *such*. *Such* is an anaphor, since it takes its interpretation from "some other part of the sentence or discourse", e.g., *who don't accept bribes* in the case of (26e). Terminologically, the *anaphor* in the case of the *such that* construction should be *cataphor*, since the pro-form (*such*) precedes the real form (*that*-complement). But I use *anaphor* as the cover term in this study.

Referring back to examples (20-23), the anaphor *such* is immediately followed by *that*-complement, from which *such* gets its interpretation. The full semantic information of *such*, in the case of the *such-that* construction, is equivalent to that of the *that*-complement. Thus, I conclude that the *such-that* construction is a special type of content clause, where *such* is an anaphoric head noun and *that*-complement is its content clause. This characterization of the *such-that* construction well fits the general picture of the content clause described above.

Recall that the head noun can be linked to its content clause by the copula (cf. 16-18). The final point to be checked is whether the *such-that* construction behaves like the regular content clause, with regard to such a linkability. The following examples are manipulated from (20-22), in connection with the point of view of the linkability:

- (27) a. ...Such is that, if it is a duck, then it waddles. (cf. 20)
- b. ...Such is that it (=the logical structure of 4) does not allow the substitution of the expression 'the evening star' for 'Hesperus'.

<sup>5</sup> With regard to 'such-N', Carlson (1977=1980) treats *such* as a modifier which means 'of that kind' or 'of kind x': e.g., every *such* bird='every bird of that kind', *such* a scholar='a scholar of that kind', *such* people='people of that kind'. Heim (1987) posits two restrictions on 'such-N'. (i) *Such* can not be interpreted as standing for a modifier that does not pick out a subset of the modified common noun: e.g., future teachers: ?? *such* teachers. (ii) *Such* resists being interpreted as standing for a closed set of individuals that do not constitute a kind: e.g., people in the next room: ?? *such* people.

(cf. 21)

- c. ...Such is that speakers do not in general need to know in advance the meaning of complex structure... (cf. 22)

The acceptability judgments of (27) vary. Most consultants (=native linguists of English) do not accept these sentences. However, this does not undermine my view that the *such-that* construction is a special content clause. My advocacy may be supported by the variation of the consultants' acceptability judgments of the following.

- (28) a. Jim's misconception that philosophy is a higher discipline than linguistics (will lead to such a conclusion). (=7c)  
 b. Jim's misconception is that philosophy is a higher discipline than linguistics.
- (29) a. %Jim's misunderstanding that the moon is bigger than the sun (will lead to a strange conclusion). (=10a)  
 b. %Jim's misunderstanding is that the moon is bigger than the sun.

All consultants agree that (28a, b) are acceptable. But in the case of (29), their acceptability judgement varies. This difference between the head nouns *misconception* and *misunderstanding* seems to suggest that the acceptability of the structure "head noun + copula + *that*-complement" depends on the nature of the individual lexical head noun to some extent (perhaps except for normal head nouns). Viewed from this perspective, the low acceptability of (27) is not accidental. My tentative explanation is that the low acceptability of (27) is due to the fact that the *such-that* construction is not yet fully generalized in use among native speakers of English. Rather its use is confined to academic circles. Furthermore, I foresee that the acceptability of (27) will increase as the *such-that* construction gets more general acceptance; i.e., from 'semi-English' to normal English.

Referring to examples (20-24), there is an important difference between (20, 21, 22) on the one hand and (23, 24) on the other. In the former, *such-that* is used as a nominal anaphor; whereas, in the latter, *such-that* is used as an adverbial anaphor. In (23), *such-that* may be rephrased by *in such a way that*. This paraphrasability is confirmed by (24), where *in such a way that* may be shortened to *such-that* without affecting its meaning.<sup>6</sup>

<sup>6</sup> There are cases in which the head noun may be deleted: e.g., 'in the sense that...' may be shortened to 'in that...' (cf. Yang (1982))

*Such that* as an adverbial anaphor may be replaced by *in such a way that*, but such a replacement is not allowed when it is used as a nominal anaphor.

To sum up, the *such-that* construction is not a relative clause but a special content clause. *Such* is an anaphoric head noun, and its full semantic interpretation comes from the immediately following content clause (= *that*-complement). The *such-that* construction is now mainly used in academic circles, and it is speculated to be used by general speakers of English in the future.

## 5. Conclusion

The answer to the question “Where do head nouns come from?” cannot be found from the syntactic perspective; rather, it can be found from the cognitive perspective. The source of head nouns of content clauses is the conceptualization process (a cognitive process). The determination of a specific head noun for a content clause (a proposition) depends on the cognizer’s propositional attitude toward a given proposition (a content clause). A natural consequence of this hypothesis is that it can naturally answer the related question “What kind of nouns can be head nouns of content clauses?”. The potential candidates for head nouns are reasonably limited to abstract and cognitive nouns which are compatible with the cognizer’s propositional attitudes.

Head nouns are categorized into three types: affirmative, pseudonegative, and negative, according to the negatability of the content clause by the nature of head nouns. Negative head nouns negate their content clauses; affirmative head nouns do not. Pseudo-negative head nouns do not negate their content clauses although non-native speakers of English might tend to regard pseudo-negative head nouns as true negative head nouns.

The ‘semi-English’ expression, the *such-that* construction, is not a relative clause, but a special content clause. *Such* is an anaphoric head noun, whose full semantic interpretation comes from the immediately following content clause (= *that*-complement). The head noun *such* and its content clause are in the relationship of *co-sense*, which also means that they are in the appositive relation, like the relation between normal head nouns and their content clauses. The *such-that* construction can be used in two ways: nominal and adverbial. In the adverbial use, *such-that* may be replaced by

*in such a way that*. The invention of the *such-that* construction is a natural evolution of English in order to meet the cognitive necessity.

This study suggests that the proper analysis of natural language requires cognitive perspectives as well. Linguists' efforts have recently been made in this direction: cf. Fillmore (1982, 1985), Lakoff (1982, 1986, 1987), Langacker (1986, 1991), Jackendoff (1983), Fauconnier (1985), among others.

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## ABSTRACT

### More on Content Clauses

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Content Clauses have the canonical form: "head noun - that - content clause". "The belief that the moon is bigger than the sun" is an example. Superficially, content clauses resemble relative clauses, but they are different syntactically and semantically. Matters of special interest concerning

content clauses are: (i) types of head nouns, (ii) the source of head nouns, and (iii) the status of the *such-that* construction (a semi-English expression). Head nouns are categorized into three types: affirmative, pseudo-negative, and negative. Negative head nouns negate their content clauses, whereas affirmative and pseudo-negative head nouns do not. For the source of head nouns, one might consider the *verb-noun correspondence hypothesis* (e. g. I believe that the moon is bigger than the sun→My/The belief that the moon is bigger than the sun). But this hypothesis loses a significant generalization because there are head nouns which lack their cognate verbs. This study proposes the *conceptualization process hypothesis*, which means that the head noun is determined by the conceptualizer's propositional attitude toward the given proposition. The *such-that* construction is a special content clause, which is a natural consequence of a linguistic filling up of the gap between cognitive and linguistic structure. This paper claims that syntactic analysis of natural language calls for cognitive consideration as well.

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