Content Clauses in English

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1. INTRODUCTION[1]

In the case of Jespersen (1964: 349-351), the term 'content clause' refers to both sentential complements and appositional complements. For example,

(1) a. He believes *that the world is round.*

   b. He knows *the fact that the world is round.*

The italicized part of (1a) which does not contain a head noun is a sentential complement, whereas the italicized part of (1b) which contains a head noun is an appositional complement. Jespersen's term, content clause, refers to both categories. This paper, however, uses the term in a narrow sense which refers only to sentential complements which are preceded by head nouns.

In traditional grammars, content clauses were understood to the effect that head nouns and their content clauses constitute a syntactic appositional relationship. Furthermore, Jespersen (op. cit.) indicated that head nouns and their content clauses may be separated by Extraposition. With regard to content clauses, generative-transformational grammars have not much surpassed studies of traditional grammars, particularly in their semantic explorations.[2]

The present paper seems to be the first attempt to explore semantic aspects of content clauses in general. In the light of semantic aspects of content clauses, the following questions are significant: (1) What kind of semantic relationship does exist between head nouns and their content clauses? (2) Are all the head nouns syntactically and semantically homogeneous? (3) Where do head nouns and content clauses come from? (4) What kind of ambiguity is involved therein? The aim of this paper is to attempt to answer these questions, and to suggest some theoretical implications for semantic analyses of natural languages.

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[2] With regard to semantic analysis, the Kiparskys (1970) investigated on factivity of the factive content clauses. Menzel (1969) broadened the scope to proposition, event, and action of content clauses. But their foci are quite different from mine.

Before proceeding to the main topics, we will briefly survey some syntactic preliminaries. First, different generative sources of content clauses are categorially exemplified in the following:

(2) a. He supports *the assumption* that transformations may change meaning.

   b. He raises *the question* of (or, as to) whether transformations may change meaning.

   c. *The proposal* that student demonstrations should be suppressed must be resisted.

   d. There is no *restriction* that girls not smoke.

The italicized parts are head nouns and the following parts are content clauses. The content clause in (a) comes from a statement. Most of the head nouns occur with this type of content clause. In (b) a question is the generative source for the content clause whose head nouns include *question, issue, discussion,* etc. In (c) the generative source of the content clause is an imperative or a proposal, whose head nouns include *order, direction, proposal, suggestion, command, insistence,* etc. This category of content clauses requires verbs to be infinite with or without the modal auxiliary *should.* And in (d) the content clause comes from a restriction or constraint sentence, whose head nouns include *restriction, constraint,* etc. This category also requires verbs to be infinite. In many respects, categories (c) and (d) may be combined into one.

Second, as shown below, determiners allowed for head nouns have the same distribution as those allowed for common nouns:

(3) a. He supports *the* hypothesis that all the possible meaning differences can be represented in the underlying structure.

   b. I have *a* notion that children are all the better for not being burdened with too much parental love.

   c. There is *no* evidence that men are superior to women.

   d. I must indicate to you *my* desire that you sit down.

   e. He expressed regret that people did not vote for him. (no Det.)

Besides, there are further variants of 'Det - Head Noun' such as 'the facts that S and that S', 'the realization by linguists that S', 'the other half of the claim that S', 'an important feature of his thesis that S', 'an admission by the man that S', etc.

Content clauses may be realized in three types of complements, that is, sentential complements known also as *that*-complements, gerundival complements known also as *poss-ing*-complements, and infinitival complements known also as *for-to*-complements. The scope of the data used in this paper is confined to sentential complements of the 'Head Noun + that S' type.

2. PROPOSED DEEP STRUCTURES

In this section I will briefly comment on deep structures for 'head noun + content clause' thus far proposed. My alternative will be presented in section 4. Jacobs and

Rosenbaum (1968) proposed the following deep structure:

(4)

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                              NP
        ┌──────────────────────┼────────────────────────────┐
        Det                    N                             S
        the                  report              (that) John left for Seoul
```
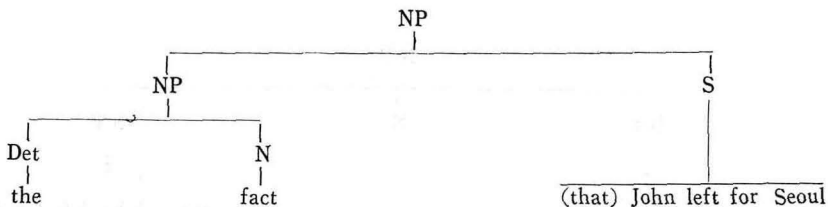
Their motivation for this structure simply comes from a differentiation argument. They recognize some syntactic and semantic differences between content clauses and relative clauses, and suggest that, since relative clauses are widely assumed to have the deep structure of [NP-S]$_{NP}$, content clauses must be assigned the deep structure of [Det-N-S]$_{NP}$.

This argument, however, is not convincing, simply because content clauses can be distinguished from relative clauses simply in terms of the absence vs. presence of coreferentiality without positing different configurations. In other words, they can be distinguished in the respect that the head noun of a content clause does not have the coreferent noun in the content clause, while the head noun of a relative clause does.[3]

The Kiparskys (1970) proposed the following deep structure for the 'factive' complement, which is an instance of content clause:

(5)

```
                               NP
        ┌───────────────────────┼───────────────────────────┐
        NP                                                   S
   ┌────┼────┐                                               │
   Det       N                                               │
   the      fact                               (that) John left for Seoul
```

From the syntactic point of view, it may be the case that structure (5) is more adequate than structure (4) in the sense that the head noun *the fact* or the content clause may be deleted under certain conditions. For transformations are more desirable to apply to constituents rather than non-constituents.
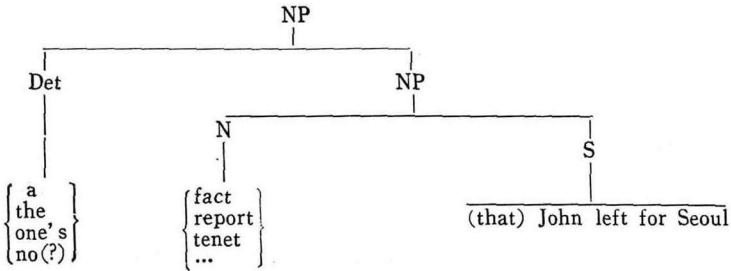
Nevertheless, there is no guarantee that structure (5) is more adequate than (4) from the semantic point of view as well. Intuition on semantic cohesiveness seems to lead us to conceive the string 'Det-N-S' as 'Det/N-S' rather than 'Det-N/S'. If this semantic intuition is correct, it is desirable to posit the following deep structure:

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[3] Householder (1974: 566–567) points out one type of English relative clause, the *such that* construction, which has not been discussed so far. In this construction, he observes, the coreferential element in the relative clause usually is not deleted:

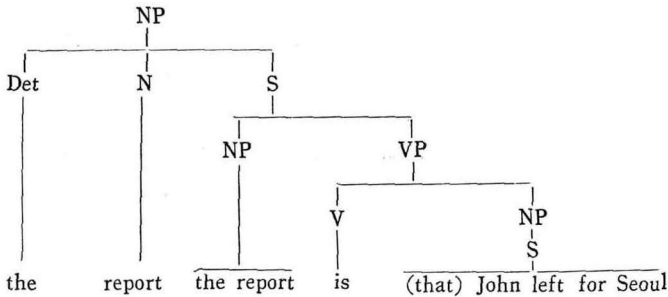   a. I'm looking for a small house such that if I live in it a year I'll be able to improve it.

    b. ?I'm looking for a small house such that if I live in for a year I'll be able to improve.
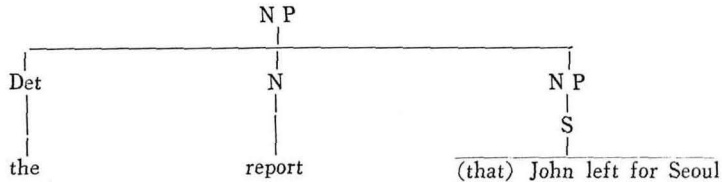
(6)

```
                              NP
                  ┌───────────┴───────────┐
                 Det                      NP
                  │              ┌─────────┴─────────┐
                  │              N                   S
                  │              ·           ────────┴────────
                ⎧ a   ⎫       ⎧ fact   ⎫    (that) John left for Seoul
                ⎨ the ⎬       ⎪ report ⎪
                ⎪ one's⎪      ⎨ tenet  ⎬
                ⎩ no(?)⎭      ⎩ ...    ⎭
```

Langendoen (1969) argues to choose (8) out of the two below fer the deep structure of content clauses.

(7)

```
                       NP
             ┌─────────┼─────────┐
            Det        N         S
             │         │    ┌─────┴─────┐
             │         │    NP         VP
             │         │    │      ┌────┴────┐
             │         │    V      NP       NP
             │         │    │               S
            the      report  the report  is  ────────┴────────
                                            (that) John left for Seoul
```

(8)

```
                              N P
             ┌─────────────────┼─────────────────┐
            Det                N                 N P
             │                 │                  S
             │                 │          ────────┴────────
            the              report       (that) John left for Seoul
```

Justification for (7) to be the deep structure, Langendoen claims, can be provided only if (9a) is grammatical.

(9) a. *The report which is that John left for Seoul is true.[4]

    b. The report, which is that John left for Seoul, is true.

According to Langendoen's judgment, however, (a) is not grammatical; hence he concludes that (7) cannot be the deep structure for content clauses. On the other hand, (9b) is grammatical, but (7), he claims, cannot be the deep structure of (9b) because (7) does not represent (9b) which has a non-restrictive relative clause. His argument is that since one of the two alternatives is incorrect, the other is forced to be correct. If

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[4] It seems to be debatable whether (9a) is grammatical or not. Some speakers say that (9a) is not totally out although it is redundant. The construction (9a) sometimes becomes grammatical when *which is* is replaced with *which say/read/mean*, depending on the content of the sentence. If this is true, Langendoen's claim weakens.
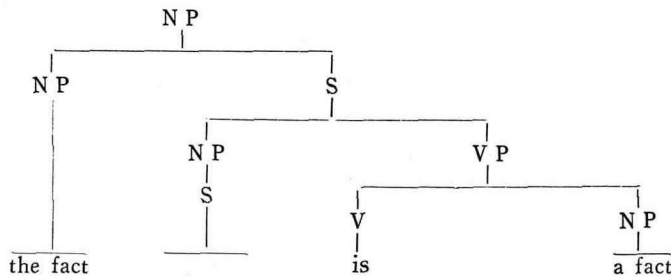
this argument is to stand, it must be beforehand proved that (7) and (8) are the only possible candidates for the deep structure under search. But this premise is not justifiable with respect to Langendoen's alternatives, because they are not exhaustive.

From a different angle, Hurford (1973: 280-283) refers in passing to the deep structure of content clauses. If I fill out his ideas, his contention may be interpreted as proposing that the generative source of content clauses cannot be homogeneous. For example, he regards (11a) and (11b) as the respective deep structures of (10a) and (10b).
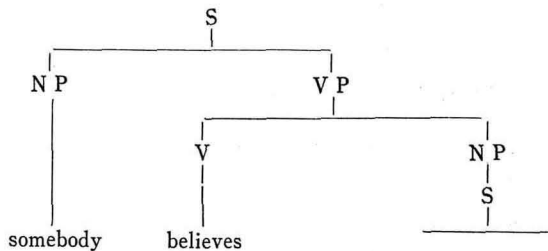
(10) a. the fact that S

　　 b. the belief that S

(11) a.

```
                         N P
              ┌───────────┴───────────┐
            N P                        S
             │             ┌───────────┴───────────┐
             │           N P                       V P
             │            │              ┌──────────┴──────────┐
             │            S              V                    N P
             │            │              │                     │
          the fact    _____          is                  a fact
```

　 b.

```
                      S
           ┌──────────┴──────────┐
         N P                     V P
          │           ┌──────────┴──────────┐
          │           V                    N P
          │           │                     S
          │           │                     │
       somebody    believes             _____
```

To sum up the essence, in the case of content clauses whose head nouns do not have the corresponding verbs, the head noun and its content clause are regarded as forming a relativized NP with the relative clause being 'S is a fact/principle/tenet/etc.', as in (11a). On the other hand, in the case of content clauses whose head nouns have the corresponding verbs, the head noun and its content clause are regarded as being derived from a sentence where the de-nominal verb constitutes the main verb, as in (11b).

Apart from the previous studies, Hurford's analysis has contributed to a deeper understanding of the generative source of head nouns. But his analysis also has difficulties. First, notice that the structure 'S is a fact' can also be applicable to de-verbal head nouns like 'S is a belief/claim/report/etc.'. This fact undermines Hurford's contention that the structure 'S is a fact' is the deep structure of content clauses with head nouns which lack the corresponding verds, since his analysis has lost a significant generalization. Second, with regard to the content clause with head nouns which have the corresponding

verbs, it is indeterminate which is the basic form between (10b) or (11b). In other words, I cannot find any clear evidence as to whether a noun is derived from the corresponding verb through nominalization, or a verb is derived from the corresponding noun through verbalization. We need further investigations on mental processes and language acquistion for the solution of this issue. At present, it is an open question. Hence Hurford's deep structure (11b) does not stand on any solid semantic and psychological arguments. Third, even in the category of head nouns which have the corresponding verbs, not all the verbs can have the structure 'Subject - Verb - that S'. For example, verbs such as *object, oppose, rebut* (whose respective nouns are *objection, opposition, rebuttal,* which may function as head nouns of content clauses) cannot co-occur with a sentential complement (cf. section 4). This fact definitely vitiates the hypothesis that so-called de-verbal head nouns come from the corresponding verbs.

Hochster (1974) hypothetically proposes that the head noun *fact* come from a semantic predicate *fact,* deriving the structure (12a) from (12b).

(12) a. the fact that John works late

   b.
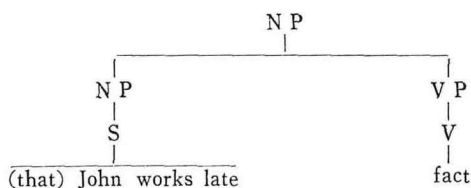
She tries to justify the deep structure (12b) from the analogous derivational process, where the (b) structures derive from the (a) structures:[5]

(13) a. I dread [[John works late] possible]

   b. I dread the possibility of John's working late.

(14) a. I fear [[John works late] likely]

   b. I fear the likelihood of John's working late.

(15) a. I resent [[John works late] probable]

   b. I resent the probability of John's working late.

If Hochster's hypothesis turns out to be adequate, she would capture a generalization that all the head nouns with or without the corresponding verbs are derived from their verbs. However, this hypothesis seems to be arbitrary and dogmatic in the sense that the head noun *fact* is assumed to be a semantic predicate. If we interpret the head noun

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[5] These sentences may be paraphrased by content clauses below:

13c. I dread the possibility that John works late.

14c. I fear the likelihood that John works late.

15c. I resent the probability that John works late.

B-constructions and C-constructions seem to have subtle semantic differences.

fact as a semantic predicate nominal (i.e., is a fact), as already pointed out by Hurford (cf. 11a), this analysis will not be too far-fetched. In this case, however, my criticisms of Hurford also apply to Hochster's hypothesis.

As surveyed above, some generative grammarians have attempted to analyze content clauses. But all of them have dealt with content clauses not as the main topic in their papers, but as a side topic in passing. At any rate, it seems clear that all the preceding analyses are not fully satisfactory and further investigations are called for. My alternative deep structure for content clauses will be presented in section 4.

3. SUBCATEGORIZATION OF HEAD NOUNS

As previously indicated in section 1, head nouns may be divided into several categories, depending upon the type of the content clause such as a statement sentence, a question sentence, an imperative sentence, etc. From a different angle, head nouns of statement clauses may be divided into three categories according to the semantic relation between head nouns and their content clauses. First,

(16) Affirmative Head Noun

    a. He heard *the news* that his team had won.

    b. He expressed *regret* that he failed the exam.

    c. This conclusion goes against *our expectations* that pronominalization within a single sentence will be obligatory rather than optional.

    d. Your argument leads to *the strange implication* that simplicity is not the criterion for the choice of the best solution.

The head nouns in (16) are affirmative in the sense that their lexical meaning is affirmative and that the head nouns do not have any effect to negate the content clause. The affirmative head nouns have the function to specify the semantic content of the content clause in terms of an affirmative concept. Most of the head nouns belong to this category.
Second,

(17) Pseudo-negative Head Noun[6]

    a. John raises *the objection* that the company was broke.

    b. John supports *the rebuttal* that the use of nuclear weapons is not effective.

    c. John supports *Bill's opposition* that wives should obey their husbands.

The head nouns in (17) carry some sort of negativity (cf. section 4) which might give non-native speakers of English the feeling that the content clause is negated. But the head nouns of this category do not negate their content clauses. For this reason, I call this category of head nouns 'pseudo-negative' head nouns. More specifically, in (17a) for

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[6] Nouns such as *rejection, refusal* have the same semantic content as pseudo-negative head nouns, but they do not co-occur with *that*-clauses; hence they do not constitute head nouns of content clauses. A couple of my informants say that (17b, c) are not perfectly natural while most of them say that they are acceptable.

instance, John objects to somebody's position which was previously indicated in the discourse, but asserts that the company was broke. Actually the verb *object* has two senses: only one sense corresponds to the head noun *objection*. This will be discussed in section 4.

Third,

(18) Negative Head Noun[7]

    a. *John's denial* that men are superior to women (is unreasonable).

      1. John asserts that men are not superior to women.

      2. John asserts that men are superior to women.

    b. *Jim's doubt* that the energy crisis probably will disappear soon (is reasonable).

      1. Jim asserts that the energy crisis probably will not disappear soon.

      2. Jim asserts that the energy crisis probably will disappear soon.

    c. *Bill's negation* that the present world is chaotic (is groundless).

      1. Bill asserts that the present world is not chaotic.

      2. Bill asserts that the present world is chaotic.

The head nouns in (18) carry negativity, which negates their content clauses, as explained in (1's) above. For this reason I call them 'negative' head nouns. What is interesting is that these constructions have another interpretation, that is, the equivalence reading to the effect that the content clause is not negated by the head noun, but expresses somebody's assertion, as explained in (2's). In (18a), for instance, John denies that men are superior to women; in other words, John asserts that men are not superior to women. This is the negation reading. In the other reading, John does not deny that men are superior to women; in other words, John asserts that men are superior to women. In the latter reading, what John denies is somebody's claim, position, etc. This is the equivalence reading, which is the only possible reading in content clauses with affirmative and pseudo-negative head nouns. In short, content clauses are ambiguous only if the head noun is a negative one. The ambiguity will be discussed in sections 4 and 5.

The implicit assumption of semantic homogeneity of the head nouns so far has not been challenged. However, the above brief observation clearly shows that head nouns are not homogeneous semantically but heterogeneous with respect to the semantic relation to the content clause. Thus a legitimate question arises as to what is responsible for such heterogeneity of head nouns with respect to their content clauses. We will attempt to answer this question in the next section.

4. GENERATIVE SOURCE OF HEAD NOUNS AND CONTENT CLAUSES

No one has so far seriouslly raised the question, "Where do head nouns and their content clauses come from?" In the case of relative clauses, the head noun is coreferential

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[7] The head noun *negation* seems not to be used very often in ordinary speeches, but it is nothing odd in the philosophical literature.

with one element within the relative clause; hence such a question is less significant. On the contrary, since coreferentiality between the head noun and one element within the content clause is not available, the question about the generative source is important.

As previously indicated in section 2, Hurford (1973) briefly touched the generative source of head nouns. To recapitulate the essence, Hurford's claim may be applicable only to what I call affirmative head nouns of content clauses. He tried to pursue two generative sources for head nouns. For 'non-de-verbal' head nouns (i.e. head nouns such as *fact* which do not have the corresponding verbs), he posited the deep structure, 'that S is a fact'. On the other hand, for de-verbal head nouns (i.e., head nouns such as *belief* which have the corresponding verbs), he posited the deep structure, 'Somebody believes that S'.

Hurford's analysis has contributed to a better understanding of content clauses and their head nouns. However, his claim fails if applied to expanded data. Let us consider affirmative head nouns first. The deep structure, 'that S is Head Noun' may also apply to de-verbal head nouns, like 'that S is a belief/expectation/assumption/etc.'. I can see no reason for the deep structure 'that S is Head Noun' to be applicable only to non-de-verbal head nouns. Hence Hurford's claim loses a significant generality.

Next let us consider pseudo-negative head nouns. This category includes *objection*, *opposition*, *rebuttal*, etc., which have their corresponding verbs *object*, *oppose*, *rebut*, etc. However, these head nouns except *objection* cannot be derived from Hurford's deep structure of 'somebody - verb - that S', as exemplified below:

(19) Pseudo-negative Head Noun

    a. (*) John objects that the company was broke.

    b. * John opposes that wives should obey their husbands.

    c. * John rebuts that the use of nuclear weapons is effective.

Verbs (except *object*) which correspond to pseudo-negative head nouns do not co-occur with a sentential complement. Hence it is not possible to derive many pseudo-negative head nouns from their corresponding verbs. It should be noted that the verb *object* behaves differently from verbs such as *oppose* and *rebut*. It has two senses. One sense is *to give a reason (against)*, as in *I object (against him) that he is too young for the position*; for this sense, the verb *object* may co-occur with a sentential complement. The other sense is *to be opposed to*, as in *I object to being treated like a child*; for this sense, the verb *object* may not co-occur with a sentential complement. Hence the head noun *objection* corresponds to the first sense. At any rate, the verb *object* in either sense has some sort of negativity.

What is interesting is the fact that the negativity of pseudo-negative head nouns cannot negate the content clause. This phenomenon can be explained by the fact that these verbs canot take a sentential complement for their object.

These verbs can exercise their inherent negativity to sentential complements only with

the following variants:

    (20) a. John objected to the company's being moved.

          (→ The company should not move.)

        b. John opposes wives' obedience to their husbands.

          (→ Wives need not obey their husbands.)

        c. John rebuts the assertion that the use of nuclear weapons is effective.

          (→ The use of nuclear weapons is not effective.)

The verbs in these constructions negate the content of the following complements, as explained in the parentheses. This indicates that the head nouns which correspond to these verbs have inherent negativity. However, the corresponding head nouns do not negate the following content clauses. This is why I call them pseudo-negative head nouns.

We now consider the generative source of negative head nouns. This category includes *denial, doubt, negation,* etc. Observe the following examples:

(21) Negative Head Noun

      a. John denies that men are superior to women.

      b. John doubts that the energy crisis probably will disappear soon.

      c. John negates that the present world is chaotic.

(22) a. John's denial that men are superior to women (is unresonable).

      b. John's doubt that the energy crisis probably will disappear soon (is reasonable).

      c. John's negation that the present world is chaotic (is groundless).

(23) a. The denial that men are superior to women (is unreasonable).[8]

      b. The doubt that the energy crisis probably will disappear soon (is reasonable).

      c. The negation that the present world is chaotic (is groundless).

The sentential complements in (21) are negated by the negative main verbs to the effect that John asserts that men are not superior to wome in (a), that the energy crisis probably will not disappear soon in (b), and that the present world is not chaotic in (c). The matrix verbs of (21) may be nominalized in the form of (22) and (23). The thing which deserves our attention is the fact that the structures (21) have no ambiguity while the corresponding nominal forms have ambiguity of negation and equivalence readings, as previously indicated in (18). The negation reading refers to the interpretation in which the content clause is negated due to the negative head noun. The equivalence reading refers to the interpretation in which the content clause is not negated due to the negative head noun but specifies the head noun. Hence in the equivalence reading, the head noun and the content clause may be connected by the copula; but this is not the case in the negation reading (cf. section 6).

Some native speakers of English may not agree with my semantic judgment on content clauses which have negative head nouns (cf. 22, 23). In the course of informant work, I

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    [8] The definite article *the* which accompanies head nouns seems to be generated anaphorically, at the same time when head nouns are assigned.

noticed that the interpretation of (23) may be different depending upon dialectal and/or idiolectal difference. One group of speakers tend to admit the negation reading only, another group the equivalence reading only, and the third group both readings. Furthermore, the same speakers' reaction showed some inconsistency when given different contexts and situations. Aside from specific details, it seems that the structure under discussion is potentially ambiguous. The potential ambiguity will be more clearly demonstrated by the negation test below.

(24) a. The denial that men are not superior to women (is unreasonable).

b. The doubt that the energy crisis probably will not disappear soon (is reasonable).

c. The negation that the present world is not chaotic (is groundless).

Notice that the content clauses above have the negation marker *not*. In (24) the primary reading seems to be the equivalence reading, to the effect that the assertion is that men are not superior to women in (a), that the energy crisis probaly will not disappear soon in (b), and that the present world is not chaotic in (c). The secondary reading is the negation reading: hence the double negation which results from the negative head noun and the negative marker of the content clause turns out to be affirmative, to the effect that the assertion is that men are superior to women in (a), that the energy crisis probably will disappear soon in (b), and that the present world is chaotic in (c).

A legitimate question now arises as to what makes such ambiguity. Whatever native speakers' 'at-first-glance' reactions may be, it seems that the inherent reading for negative head nouns is the negation one, which is correlated with the structure of 'Subject - Verb (i.e., deny, doubt, negate, etc.) - that S'.[9] The peripheral reading for negative head nouns seems to be the equivalence reading, which seems to be assigned by the predominant equivalence reading of the content clauses with all types of head nouns except negative head nouns.

With respect to the generative source of the negative head nouns in (22, 23), it might be possible to regard the negative head nouns as derived from the corresponding verbs of (21). Nonetheless, a problem still remains. The verbs in (21) might be regarded as the generative source of the negation reading of the negative head nouns. But this is not the case with the equivalence reading of the negative head nouns. Thus we are required to explicate the generative source of head nouns when they have the equivalence reading. Recall that the negation reading is possible only with negative head nouns; all the rest have the equivalence reading only. It was also indicated above that matrix verbs cannot be the generative source of pseudo-negative head nouns (cf. 19). Furthermore, in the case of the affirmative head nouns, one class of head nouns, that is, so-called de-verbal head nouns might be regarded as derived from matrix verbs (e.g., believe : belief,

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[9] Native speakers' 'at-first-glance' intuitions are not necessarily correct. Furthermore, the more refined intuitions, I claim, are native linguists' intuitions, not native speakers' intuitions. For further discussion, see Yang (1976).

claim:claim, explain:explanation, observe:observation, etc.), but the other class, that is, non-de-verbal head nouns may not so (e.g., fact, property, principle, thesis, point, case, attitude, position, problem, tenet, rule, notion, proposition, doctrine, condition, sentiment, event, state, etc.). Thus the question to be asked about the generative source is not only about the negation reading of negative head nouns but also about the equivalence reading of all types of head nouns.

Since non-de-verbal head nouns may not be regarded as derived from the corresponding verbs, we are required to seek the generative source of non-de-verbal head nouns from sources other than their corresponding verbs. I propose that head nouns of this category and their content clauses come from direct speeches. I call this the direct speech source. For illustration, consider some sample direct speeches below:

(25) Affirmative Head Noun

    a. (speaker A): "Mary is pregnant."

    b. (speaker B): "It is too bad."

    c. (speaker C): Speaker B regrets *the fact* that Mary is pregnant.

Speaker B regards as a *fact* speaker A's direct speech, "Mary is pregnant." That is why he says, "It is too bad." In other words, speaker B CONCEPTUALIZES speaker A's utterance as a fact. I call this phenomenon the CONCEPTUALIZATION PROCESS. Through this process, the conceptualized noun *fact* constitutes the head noun and the direct speech the content clause in (c).

(26) Affirmative Head Noun

    a. (some speakers): "Mary is pregnant."

    b. (speaker A): "It is not true."

    c. (speaker B): *The rumour* that Mary is pregnant is not true.

Speaker A conceptualizes some speakers' direct speech, "Mary is pregnant" not as a fact but as a rumour. That is why speaker A says, "It is not true." The conceptualized noun *rumour* constitutes the head noun and the direct speech the content clause in (c).

(27) Pseudo-negative Head Noun

    a. (speaker A): "John is a good student."

    b. (speaker B): "No, John is not a good student."

    c. (speaker C to B): Your/The objection that John is not a good student is
               emotional.

(28) a. (speaker A): "The company has made a lot of money."

    b. (speaker B): "The company is broke."

    c. (speaker C to B): Your/The objection that the company is broke is groundless.

In (27) speaker A regards John as a good student while speaker B as not a good student. In this situation, speaker C conceptualizes speaker B's position to speaker A as an objection. The conceptualized noun *objection* constitutes the head noun and speaker B's direct speech the content clause in (c). The same process also applies to (28).

(29) Negative Head Noun

    a. (speaker A): "The man is lazy."

    b. (speaker B): "The man is diligent."

    c. (A to B): Your/The denial that the man is diligent[10] is groundless.

(30) a. (speaker A): "The statement is true."

    b. (speaker B): "No, the statment is not true."

    c. (A to B): Your/The denial that the statement is not true[10] is groundless.

In (29) speakers A and B have different opinions about the man under consideration. Speaker A conceptualizes speaker B's position as a denial to his position. Thus, the conceptualized noun *denial* constitutes the head noun and speaker B's direct speech the content clause in (c). The same process also applies to (30).

To sum up the above explanation, the generative source of content clauses is direct speech, and that of head nouns is conceptualized nouns in the discourse. These principles can be generalized as follows:

(31) Conceptualization of Direct Speech (first approximation)

    a. Speakers conceptualize direct speeches (i.e., roughly, propositions) as a fact/idea/belief/comment/objection/denial/etc. depending on the context.

    b. Direct speeches consititute content clauses.

    c. Conceptualized nouns such as fact/idea/belief/comment/objection/denial/etc. constitute head nouns.

Note that the same proposition (i.e., somebody's direct speech) may be differently conceptualized due to the context. For example,

(32) a. the property, the fact, the claim. the belief, the guess, the conclusion, the hypothesis, etc.

    b. (that) the various tones are not freely assigned to syllables.

The one and the same proposition in (32b) may co-occur with any head noun in (32a). Which head noun is to be chosen out of them is determined by how the speaker conceptualizes the proposition in the discourse.

In the conceptualization process, it seems to be usual that head nouns and content clauses are realized in linguistic forms at the same time. But there may be also cases where the head noun or the content clause is previously overtly expressed in the discourse. For example,

(33) a. John beats his wife. If I were to offer *an explanation*, I would say that she does not obey her husband.

    b. *The explanation* that she does not obey her husband is not convincing.

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[10] The other possible connections for (29c) and (30c) are "Your/The denial that the man is lazy is groundless", and "Your/The denial that the statement is groundless is true," respectively. This is possible due to the ambiguity between the negation and equivalence readings of negative head nouns. In (29) and (30) we are concerned only with the equivalence reading.

(34) a. Everybody believes that "An ounce of prevention is worth a pound of cure,"
        but not everybody follows *this advice*.

    b. Fortunately, John follows *the advice* that an ounce of prevention is worth a
        pound of cure.

In (33), (a) and (b) constitute a coherent discourse. The head noun *explanation* in (33b)
is previously expressed in (33a). On the other hand, in (34a) the content clause precedes
the head noun.

The examples (33, 34) provide a significant phenomenon also in another respect. Head
nouns such as *explanation* and *advice* might be regarded as derived from their corre-
sponding verbs, since they have the corresponding verbs.[11] However, the head nouns in
(33, 34) does not follow such a derivational process. This fact suggests itself that there
is no definite reason that even the head nouns which have their corresponding verbs are
derived from verbs. If the from-verb-to-noun derivational process is not justified, we have
no reason to divide the generative source of head nouns into two classes, that is, the
verbal source and the direct speech source. Rather, the direct speech source is nearer the
conceptual structure of content clauses with their head nouns, and it provides a unified
explanation for the generative source under search. I claim that the principles (31) are
the ultimate generative sources of content clauses and their head nouns.

One might argue that there are still possibilities that verbs are the generative source
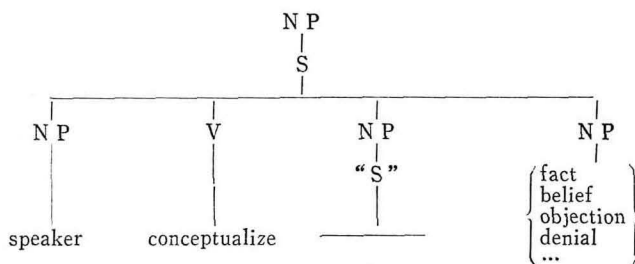for their nouns in the discourse like the following:

(35) a. John *believes* that the world is flat.

    b. John holds *the belief* that the world is flat.

    c. *John's belief* that the world is flat is misconceived.

However, there is no a priori reason to regard the verbal form as the precedor of the
nominal form in (35). Instead, it will be the case that speakers who are ready to utter
the verbal form *believe* for instance in certain context are also ready to utter the nominal
form *belief* at the same time, or even prior to that time. Thus, it is groundless and arbi-
trary to derive nouns from verbs or vice versa with respect to the mental process of
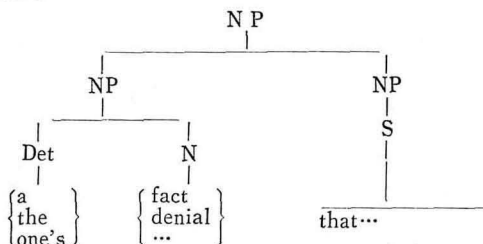conceptualization.

If we adopt (31) as the governing principles, we may posit the conceptual and surface
structures of content clauses and their head nouns as follows:

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[11] It should be noted that the verb *explain* has two senses: *to give reason for* and *to make clear*.
The verb in the former sense is factive, while the verb in the latter sense is non-factive (cf.
the Kiparskys (1970)). The former does not co-occur with a sentential complement, while the
latter does.

(36) a. conceptual structure

```
                          N P
                           |
                           S
                           |
      ┌──────────┬──────────────────┬──────────────┐
     N P         V                 N P            N P
      |          |                  |              |
      |          |                 "S"        ⎧ fact     ⎫
      |          |                  |          ⎪ belief   ⎪
   speaker  conceptualize      ─────────       ⎨ objection ⎬
                                               ⎪ denial   ⎪
                                               ⎩  ...     ⎭
```

b. surface structure

```
                   N P
                    |
        ┌───────────────────────┐
       NP                      NP
        |                       |
    ┌───────┐                   S
   Det      N                   |
    |       |                   |
 ⎧ a   ⎫ ⎧ fact  ⎫         ─────────
 ⎨ the ⎬ ⎨ denial⎬          that ···
 ⎩ one's⎭ ⎩  ... ⎭
```

We have surveyed, in section two, various proposed deep structures for content clauses, and found that all of them are not satisfactory in one way or another. The preceding discussions in sections three and four provide semantic motivations for the deep structure (36a), where "S" refers to direct speech, which will be realized as a content clause on the surface. Now I will provide a syntactic motivation for this deep structure. The verb *conceptualize*, like verbs sueh as *regard* and *consider*, is a three-place predicate. This fact is represented in (36a). These verbs require the rightmost NP to have preposition *as* on the surface, as illustrated below.

(36) c. ?*He conceptualizes that a war will break out soon as a groundless rumour.

      d. He conceptualizes as a groundless rumour that a war will break out soon.

If the direct object NP is a sentential complement as in (36c), the surface acceptability considerably decreases; a well-motivated rule, Heavy Constituent Shift, is called for in order to increase the acceptability as in (36d). Thus the deep structure (36a) is syntactically well motivated as well.

The derivation of the surface structure (36b) proceeds in the following manner. In the surface structure, the subject NP is not realized as it is, but is reduced to the possessive form *one's* which is illustrated in (36b). The possessive form may be changed into the definite article *the* or the indefinite article *a/an*. The main verb disappears in the process of nominalization, but this phenomenon is nothing peculiar in the light of the possessivization process. The sentence *I have a book*, for example, may be nominalized into *my book*, where the main verb disappears through possessivization. In (36a), the disappearance of the nodes of the subject NP and the main verb naturally deprives the node S of its sentencehood; hence this node must be erased as well. The resultant tree

will be like the following:

(36) e.
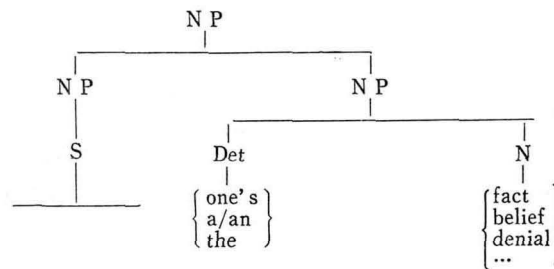
In some SOV languages such as Korean and Japanese, this order in (36e) is the correct surface structure, where the content clause precedes the head noun. For many SVO languages including English, however, the two NP's must be permuted as in (36b) by Head Noun Inversion. Surface structures (36b) and (36e) well express the syntactic appositional relationship between the head noun and the content clause.

The principles of the conceptualization process (31) have one problem unsolved. The principles (31) cannot solve the ambiguity connected with negative head nouns. The equivalence reading is accounted for by the principles (31), but the negation reading is not. In order to make up for this weakness, we need to revise the conceptualization process (31) by incorporating the following:

(37) Conceptualization Process of the Ambiguity of Negative Head Nouns

   a. Equivalence reading: Speakers conceptualize direct speeches as a denial/doubt/ negation/etc.

   b. Negation reading: Speakers conceptualize direct speeches as denied/doubted/ negated/etc.

Now the revised conceptualization process reads as:

(38) **Conceptualization Process of Direct Speech** (revised)

   a. (i) Equivalence reading: Speakers conceptualize direct speeches (i. e., roughly, propositions) as a fact/idea/belief/comment/objection/denial/etc., depending on the context.

     (ii) Negation reading: Speakers conceptualize direct speeches as denied/doubted/ negated/etc., depending on the context.

   b. Direct speeches constitute content clauses.

   c. Conceptualized nouns such as fact/idea/belief/comment/denial/being denied/ being doubted/being negated/etc. constitute head nouns.

Note that passive concepts such as *being denied, being doubted*, and *being negated* in (38c) are realized on the surface as head nouns in the active forms of *denial, doubt*, and *negation*, which result into ambiguity of negative head nouns already discussed. This syntactic convergence, however, is nothing peculiar in the light of head nouns such

as *impression*:

(39) a. John's impression that Mary is honest (will last long).

b. John impresses us that Mary is honest.

c. John is impressed that Mary is honest.

The head noun *John's impression* in (39a) may be interpreted either as active (39b) or as passive (39c). In fact, the active and passive contrast is not realized in many nominal forms. Nominal forms such as *assistance, defence, education, praise, reception, recognition, release, robbery, trial, service, support* are potentially ambiguous in the respect that both active and passive interpretations are possible. For example,

(40) a. *Mary's robbery* gave her friends a big shock.

b. Mary robbed somobody of his money.

c. Mary was robbed of her money (by somebody).

Mary's robbery may be interpreted either as active (40b) or as passive (40c).

It is intersting to note that the conceptualization precess (38) has an analogue in the pro-formation process. For example, once a proper name is introduced into a discourse, it may be referred to in three different ways (i.e., definite description, epithet, and pronoun) in the ensuing sentences in the discourse (cf. Lakoff 1968):

(41) a. proper name: John

b. definite description: the man, the teacher, the father, etc.

c. epithet: the bum, the bastard, the fool, etc.

d. pronoun: he

Speakers may conceptualize a proper name *John* as a definite description *the man*, an epithet *the fool*, or a pronoun *he*, for example. They may constitute appositional phrases like *John, the man*; *John, the fool*; etc.

In a similar fashion, once a direct speech (i.e., a proposition) is introduced into a discourse, it may be referred to in two ways (i.e., definite description/epitht, and pronoun):

(42) a. proposition: John beats his wife.

b. definite description/epithet: the fact, the rumour, etc.

c. pronoun: it, this, that

Speakers may conceptualize a proposition *John beats his wife* as a definite description/ epithet *the fact, the rumour*, or the like. They constitute an appositional relation like *the fact/that John beats his wife*, which correspond to a head noun and its content clause.

It is significant to note that analogues above suggest themselves that the conceptualization process captured in (38) is not an arbitrary and far-fetched mental process, but a natural and well-founded linguistic mental process.

5. AMBIGUITY[12]

In this section, we will discuss ambiguity involved in content clauses. Consider the following:

(43) a. Bill supports your denial of her opinion to the effect that all men are equal. (three readings)

b. Bill supports your denial of her opinion that all men are equal. (no ambiguity)

c. Bill supports another half of her hypothesis that all men are equal. (no ambiguity)

d. Bill supports your denial to the effect that all men are equal. (two readings)

In (43a) the phrase *to the effect* may qualify *Bill supports, your denial*, or *her opinion*; hence three ways ambiguous. In (43b) the content clause has two head nouns *your denial* and *her opinion*. But some perceptual strategy seems to connect the content clause to the nearer noun, hence no ambiguity arises. In (43c) the content clause has two head neuns, which are an example of part-whole relation. In the case of part-whole relation, the content clause seems to tend to be connected with the part head noun, hence no ambiguity results. In (43d) the phrase *to the effect* qualifies *Bill supports* or *your denial*, hence two-ways ambiguous.

Incidentally, the examples of content clauses cited in this paper are mostly restricted to either the subject or the object function just for convenience. But it should be noted that content clauses may also constitute prepositional phrases like: to the effect that S, on the ground that S, to the extent that S, with the result that S, with the difference that S, under no illusion that S, etc.

We now consider ambiguity in the case where content clauses are separated from their head nouns by Extraposition-from-NP. For example,

(44) Affirmative Head Noun

a. The fact that John kissed Mary is obvious.

b. The fact is obvious that John kissed Mary.

(45) Pseudo-negative Head Noun

a. The objection that men are superior to women is groundless.

b. The objection is groundless that men are superior to women.

(46) Negative Head Noun

a. The denial that men are superior to women is unreasonable.

b. The denial is unreasonable that men are superior to women.

In the case of affirmative and pseudo-negative head nouns (44, 45), Extraposition-from-NP has no effect on semantic interpretation. On the other hand, the transformation in the case of negative head nouns (46) affects the ambiguity. The sentence (46a) where the head noun and the content clause are not separated has the ambiguity of equivalence and

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[12] This section may be regarded as a big footnote, since this does not exactly fit into the whole paper.

negation readings, as previously indicated in section 4. However, the sentence (46b) where the head noun and the content clause are separated seems to have no ambiguity for the majority of English speakers; they have the equivalence reading only. Some speakers still have the ambiguity even in the sentence (46b), but their primary reading seems to be the equivalence reading.

As previously indicated in section 4, head nouns and their content clauses may be connected by the copula:

(47) Negative Head Noun

    a. The denial is that men are superior to women.

    b. The negation is that the present world is chaotic.

The sentences in (47) where the head noun is separated from the content clause by the copula seem to have no ambiguity even for the speakers who admit the ambiguity in the sentences where the head noun is separated from the content clause by Extraposition-from-NP. If this is true, it seems to suggest that the predominant interpretation of content clauses is the equivalence reading, regardless of the different types of head nouns (i.e., affirmative, pseudo-negative, and negative).

It should be noted that the ambiguity of content clauses with negative head nouns disappears, if their head nouns are negated as in the form of 'no - Head Noun' or 'not - any - Head Noun'. For example,

(48) a. There is no doubt/denial that semantics is more interesting than syntax.

    b. There is not any doubt/denial that semantics is more interesting than syntax.

    c. We have no doubt/denial that semantics is more interesting than syntax.

    d. We don't have any doubt/denial that semantics is more interesting than syntax.

    e. We don't doubt/deny that semantics is more interesting than syntax.

The negative head nouns in (48a) are negated by *no*; the negated negative head nouns result in affirmative head nouns (e.g., no-doubt → no-not-believe → belief). Hence they have the equivalence reading only. The same effect applies to the other sentences in (48).

6. THEORETICAL IMPLICATIONS

The search for generative sources of surface structures has been one of the genuinely significant goals in generative-transformational grammar. In historical retrospective, the earliest form of this search was to posit deep structures of the Chomsky's standard theory type. Efforts have been strenuously continued to lead to deeper and hence more abstract structures, and up to pre-lexical structures of generative semanticists. If the search for generative sources of surface structures is really worth continuing, the direction of pre-lexical structures alone is not sufficient to capture the deep-seated linguistic mental processes of natural languages. This paper proposes that the conceptualization process, which is another direction, should be incorporated into the grammar of human languages. In

terms of the mental process of language production, conceptualization processes are the most basic.

With no postulation of the conceptualization process, the generative sources of linguistically significant phenomena such as content clauses and pro-forms, which are dealt with in this paper, cannot be captured at all. It is worthwhile, I believe, to develop this sort of research in natural languages.

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