'Subject' in Recursive Categorical Syntax

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0. Introductory Remark

This paper deals with three separate approaches to the notion of 'subject': generative transformational grammar, symbolic logic, and recursive categorical syntax. Each of these systems' distinct views on subject is critically examined and evaluated. In support of Recursive Categorical Syntax (Brame, 1984; 1985), however, the major emphasis is placed on the definition of subject in this theory.

1. Hearer Oriented Notion of 'Subject'

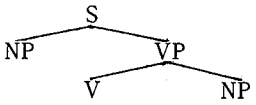
A hearer oriented definition of subject may be seen basically as one which attempts to capture 'subject' in such a way so that the hearer can pick out the subject among other constituents in an utterance. Let us examine now how the notion of subject is considered and expounded in two representative theories. We first take up a transformational account and then turn to a symbolic logic approach to defining subject.

1. 1. 'Subject' Defined: Transformational Approach

In the early stage of transformational generative grammar (TGG), the notion 'subject' was customarily defined as in (1) below. Alternatively, TGG offers the tree diagram (2) which pictures the notion of both subject and object at the same time. (See Chomsky, 1965)

(1) [NP, S]

(2)



In the labelled bracketing (1), the NP is considered the subject. In the branching diagram (2), the leftmost NP directly dominated by the S node is taken to be the subject, while the rightmost NP immediately under the VP node is thought of as the object.

In the more advanced stage of TGG, for example, in X-bar theory, the definition of subject (1) may be altered to (3). (See Chomsky, 1986)

(3) [NP, INFL"]

No major change, however, seems to be observed here. The INFL" is equated with S.[1]

Some linguists rejected the above treatment of subject as lacking empirical support. In this connection the following are representative criticisms.

(4) a. VP constituent is restricted to SVO languages.

(Schwarts, 1972)

b. Japanese as a SOV language lacks a VP constituent.

(Hinds, 1973)

In consideration of these comments, Hsieh (1979) points out that if a VP is not universally testified, then the empirical status of subject and object becomes questionable since the notion of subject and object depends on the VP constituent. In addition to offering this penetrating observation he also puts forward the claim that transformational account fails to assign subject and object their proper roles.

1. 2. 'Subject' Defined: Symbolic Logic Approach

Based on the 'logic of relations' in predicate logic, Hsieh (1979) proposes a definition of subject and object as exemplified in (5).

(5) a. Rxy

b. Rxyz

(5a) can be read as 'x and y stand in the relation R.' Similarly, (5b) can be interpreted as 'x and y and z stand in relation R.' The R here is called

'predicate.' And x, y, z, etc. are named 'individual variables.' These are capable of being replaced by 'individual constants' such as a, b, c, etc. Of importance here is the idea that the linear order of individual variables plays the major role in distinguishing subject and object. This can be stated as follows: The first individual variable x is taken to be the subject, and the second individual variable y, the object. And the third individual variable z as in the case of (5b) is thought of as the indirect object.

An English sentence or two may serve to elucidate the above idea of Hsieh.

(6) a. Plato saw Socrates. (*SAW*ps)

b. Socrates gave Plato a blow. (*GAVE*spb)

The 'logical representation' of each example in (6) is given in the parentheses. Let us take the logical representation of (6a) as an illustration. Here the italicized item *SAW* is analogous to R in (5), the 'predicate', whereas the lower case Latin p and s are 'individual constants.' With these in mind we can now easily relate the initial constant p with the subject, and the second constant s with the object. If there is a third individual constant as in the case of (6b) it is connected to the indirect object.

Let us now consider a couple of problems found in Hsieh's analysis. In his system, passive constructions such as in (7a) may be assigned the logical representation illustrated in (7b).

(7) a. The painting was made by John.

b. *WAS-MADE-BY*pj

It naturally follows from the above definition that p, 'the painting' is regarded as the subject, and j, 'John' is considered to be the object. This outcome, however, seems to run counter to the widely accepted point of view that would say that 'the painting' is the grammatical subject, whereas 'John' is the logical subject. Besides, the fact that the following examples exist suggests that the matter is not so simple as Hsieh conceived in the case of passives.

(8) a. The painting was sold

The painting was sold to him

b. The kidnap-murder suspect was arrested

The kidnap-murder suspect was arrested at the airport

Yet there is a more serious problem. The definition Rxy is insufficient in languages other than English since in many cases the first individual variable right next to R may not represent the subject. The proof of this can be provided from VSO (9a) and VOS (9b) languages,[2] and inflected languages such as Latin (10).

(9) a. Walsh: V Lladdodd S y ddraig O y dyn
killed the dragon the man
'The man killed the dragon'

b. Malagasy: V Nahita O ny mpianatra S nyvehivavy
Saw the student the woman
'The woman saw the student'

(10) Latin: S Pater V amat O filium

S Pater O filium V amat

O Filium V amat S Pater

'A father loves his son'

The problem under consideration is not peculiar to Hsieh's analysis. The same thing is true of the transformational account, of course. This particular problem together with the ones pointed out previously produce a serious threat to the hearer-oriented definitions and do not seem to allow an easy way out.

2. Speaker Oriented Notion of 'Subject'

In a hypothetical speaker-hearer situation, speaker (in this respect hearer as well) is fully equipped with the 'internalized' system of grammar which enables him to command language at will. In creating utterances, however, speaker does not seem to be analyzing and determining grammatical constituents such as subject, object, etc. (This basic characteristic

belongs to hearer.) Rather, by-passing such analytic and interpretive processes the speaker directs his mind to arranging and combining words in order to create an utterance that corresponds to a physical or mental urge at a given time and situation.

In light of the above assumptions we take a step further and assume that, as far as the speaker is concerned, subject, object, etc. are 'predetermined' by the time of utterance. It follows from these assumptions that subjects can be classified into two groups: one group is composed of the subject forms of personal pronouns such as I, he, she, etc.; and those lexical items that are assigned 'subject function' constitute the other group.

In view of the above argument, Recursive Categorical Syntax may be considered a speaker oriented theory since it aims to define subject in terms of the speaker's point of view in the same sense as stated above. In the following subsection we examine the definition of subject in Recursive Categorical Syntax.

2. 1. 'Subject' Defined: Categorical Approach

It is an empirical fact that English includes the subject forms of personal pronouns such as he, she, and I. In Recursive Categorical Syntax such intuitively recognizable subjects can be specified partially as in (11).

(11) a. ⟨he, $D3, 3T°⟩
b. ⟨she, $D3, 3T°⟩
c. ⟨I, $DI, IT°⟩

The initial coordinate in the angle bracket is called phonetic or orthographic word, the second component is its intrinsic category, and the third component is its argument category. Let us examine (11a), in order to elucidate the formulas and terminologies given so far. We intuitively know the following three points: (i) he is a subject, hence designated by the symbol $; (ii) he is a determiner,[3] thus indicated by D; and (iii) he is the third person, therefore signified by 3. Putting all these together we have $D3, the intrinsic category of he. As a subject 'he' may take tense as its argument category. In this particular case the tense is the present, represented by the superscript °. A subject can also take past tense. In that case we

can superscribe T with $^-$, the symbol for the past. The tense is composed with the third person 3 to agree with the subject's intrinsic category. The rest of the formulas can be interpreted analogously.

We know words such as John, Mary, the painter, a cat, etc. are not intrinsically subjects. However, they too can become subjects of course. How do we account for this fact? A subject function is given to a word! For this reason, John, the painter and a physicist in the following examples act as subjects.

(12) a. John does not believe that the universe is finite.
b. The painter was a great artist.
c. A physicist failed to see the point.

But now how do we define this 'subject function'? In order to achieve this, let us first examine some characteristics of 'subject function' (hereafter, SF). Apparently, SF is qualitatively different from a word which is intrinsically subject; SF is essential in the process of making a word into subject; SF has all properties of a subject word except the initial coordinate. Let us call this phonetically null word a 'subject identity word' (henceforth, SIW). Once SIW is fused with another word by Word Induction (13), both intrinsic category and argument category of SIW are handed over to the word it is combined with. (Word Induction is a connector by which words are combined and a string of words is produced as a result.) The above theoretical developments give rise to the subject identity word as visualized in (14).

(13) Word Induction (See Brame, 1984; 1985)
(i) If $L_i \in LEX_o$, then $L_i \in LEX$.
(ii) If $L_i = \langle x, \phi, \psi_1, \ldots, \psi_n \rangle \in LEX$ and $L_j = \langle y, \psi_1, \sigma, \theta_1, \ldots, \theta_m \rangle \in LEX$, then $\langle x-y, \phi\ \psi_1 \sigma, \theta_1, \ldots, \theta_m, \psi_2, \ldots, \psi_n \rangle \in LEX$.

(14) $\langle \Lambda, \$, D_n, {}_nT^x \rangle$

The subscript n in (14) is a variable including I,[4] the first porson, 2, the second person, and 3, the third person. The superscript x is another variable ranging from $^\circ$, the present to $^-$, the past.

Let us demonstrate how (12c), for example, can be induced given (13), (14) and the relevant lexical items.[5]

(15) a. ⟨a, D, N⟩ (⟨physicist, N⟩)=⟨a-physicist, DN⟩

a. ⟨Λ, $, D, T^x⟩ (⟨a-physicist, DN⟩)=⟨a-physicist, $DN,$T^x$⟩

c. ⟨failed, $T\overline{\ }V$, T⟩ (⟨to, T, V⟩)=⟨failed-to, $T\overline{\ }VT$, V⟩

d. ⟨failed-to, $T\overline{\ }VT$, V⟩ (⟨see, V, D⟩)=⟨failed-to-see, $T\overline{\ }VTV$, D⟩

e. ⟨failed-to-see, $T\overline{\ }VTV$, D⟩ (⟨the-point, DN⟩)=⟨failed-to-see-the-point, $T\overline{\ }VTVDN$⟩

f. ⟨a-physicist, $DN, T^x⟩ (⟨failed-to-see-the-point, $T\overline{\ }VTVDN$⟩)=⟨a-physicist-failed-to-see-the-point, $DNT\overline{\ }VTVDN$⟩

3. Concluding Remark

With regard to the notion of subject, the Recursive Categorical Syntax approach commands serious attention for the following reasons:

(i) It offers a fresh view on the notion of subject from a speaker-oriented angle.

(ii) It does not abstract the notion of subject, but rather it zeros in on functions intrinsic to lexical items.

(iii) Thus, subjects such as he, she, and I are defined straightforwardly in accordance with the empirical facts.

(iv) The subject-verb agreement in number and person can also be included in the definition of subject in a simple and straightforward way.

But the most severe problem still lingers: How do we account for a range of differently situated NP's serving as subjects? As we have shown above, subjects are in general not located at the leftmost position of sentences in VSO, VOS languages and in inflected languages. Our next paper aims at a solution for the problem: How do we incorporate the above fact about differently situated subjects into Recurive Categorical Syntax? We have to wait for results of further study on this hard nut to crack and other related problems.

FOOTNOTES

* I am grateful to Carol Rinnert for her stylistic suggestions on an earlier version of this paper.

1) In conjunction with the definition of object, it should be borne in mind that in X-bar theory the object is defined as [NP, VP]. The theory, however, does not specify the position of this object NP as to whether it occurs to the left or to the right of VP.

2) The Walsh and Malagasy examples, except my English translations, are taken from Tanaka et al (1988 : 730).

3) Following Brame (1984 ; 1985) I consider personal pronouns such as he, she, I, etc. determiners. The main reason for this move is that personal pronouns such as these cannot be modified by determiners.

4) The symbol I here should not be confused with 1, the identity category. (See Brame, 1984)

5) For the sake of simplicity and to avoid unnecessary complications which might arise, the number agreement is not included in the derivation.

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