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ON MOVEMENT CONSTRAINTS

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Abstract: This is an attempt to explain and justify some
transformational constraints that are more often than not
treated as syntactic conditions. There is a whole range of
data that is not accounted for by Ross' original formulation
of the constraints. Much of it has been discussed in the
bulk of literature dealing with the topic. Generally the
approaches taken represent rather isolated and partial treat-
ments. Using Montague's idea of 'main verb', we attempt to
present a general treatment which is psychologically better
justifiable than conventional treatments.

In recent linguistic literature, several transformational constraints
such as Postal's Cross-Over Constraint (1971), G. Lakoff's derivational
constraints (1971) and Ross' movement constraints (1967) have been pro-
posed in order to exclude those ill-formed sentences which are otherwise
allowed. In addition to more familiar sort of data discussed in the papers
just mentioned, the ungrammaticality/strangeness of the following sentences
need to be explained.

(1a)   *The girl who John asked me whether Tom was bothering was Mary.
(1b)   *Who did John ask you whether Tom was bothering?
(1c)   *Mary John asked me whether Tom was bothering.

(2a)   *The man that John asked me what was bothering is my brother.
(2b)   *Who did John ask you what was bothering?
(2c)   *Tom John asked me what was bothering.

(3a)   *This is the medicine which John did not die although he took
          against doctors' warning.
(3b)   *Which medicine did John not die although he took against
          doctors' warning?
(3c)   *This medicine John did not die although he took against
          doctors' warning.

The purpose of this paper is to present an alternative formulation
of the constraint that blocks the derivation of the above sentences, a
semantically oriented account in the spirit of a suggestion made in a
footnote on movement transformations (1974:200, fn. 13). Montague's
suggestion is that the first occurence of the variable (within a relative
clause) to be replaced by the relative pronoun must be an argument to the
main verb of that relative clause. Thus, in 1a, the relative clause has
the form 'John asked me if Tom was bothering x' and 'x' is not an argument
of the main verb 'asked'. In 2a, the two constituent sentences are 'a
man_i is my brother' and 'John asked me what was bothering a man_i'. Notice
that in the second sentence, which becomes the relative clause, the co-

referential NP is not an argument of the main verb 'asked'. In the same way, in 3a, the relative pronoun is not an argument of the main verb 'die' but of the embedded 'took'. This way, once Montague's condition is generalized to all movement transformations, it accounts for the ungrammaticality of all the sentences above.

The generalized version of the condition reads as the following:

> Only those NP's which are arguments of the main verbs can be moved by such transformations as Relativization, Question Formation, and Topicalization.

Definitely the concept of 'main verb' plays a crucial role here. As it stands, however, the concept is much too vague. The questions that have to be answered include on what level is this verb supposed to be the main verb, that is, on the deep structural level in some sense of the word on an intermediate level, or on the surface level? Should we consider only a simple verb as the main verb or sometimes even more complex verbs also, and if the latter, under what conditions is a complex verb considered as the main verb?

In view of the following sentences, it is clear that the main verb cannot be defined on an unmodified surface level:

(4a) The hat which I believed that Otto was wearing was red.
(4b) The teacher who it was expected that the principal would
      fire is a crusty old battleax.
(4c) The book which Tom strongly suggested that I should by all
      means read was Chomsky's Aspects.
(4d) The man who it is fortunate for our family that Mary likes
      is Irish.

The relative pronouns in these sentences are not arguments of the superficially main verb within the relative clauses. Nevertheless, the movements of the relative pronouns from their original positions do not render the sentences ungrammatical. It seems that such modal indicators as 'x believes that', 'x expects that', and 'x tells y that', and propositional attitude expressions as 'it is fortunate that' and 'I am sure that', which expressions could be construed to be modifiers of the main sentences rather than themselves being the main sentences, are to be ignored in determining the main verb of the sentence.

So what are we saying with regard to the questions raised concerning the concept of main verb? One thing that we should not be saying is that the main verb should be determined on the deep structure level, not at least in any of the familiar sort, not even in the so-called logical structure. In order to see why, let us examine the following sentences:

(5) The book which John   i) asked me to buy
                                  ii) promised me to buy
                               iii) expected me to buy
                                iv) forced me to buy
                                 v) persuaded me to buy
         was Principia Mathematica.

One might argue that the predicates 'asked', 'promised', and 'expected' in i-iii above are some sort of modal indicators, but one can hardly argue the same for iv and v. The verb 'force' is what Karttunen (1971) calls an _If_-verb. The sentence 'x forced y to do z' implies that 'y did z'. Sentence v in at least one of the readings has the implication that John actually did buy the book. The main verbs of the relative clauses in iv and v are more than just the modal indicators.

The predicate constructions in 5 are those to which Equi-NP Deletion or Subject Raising has applied. Both of these rules can be considered as sentence-collapsing. In other words, the relative clauses in 5 are dominated by one S node without having any other S node under it. The only possible objection to considering the rules as sentence collapsing that I can imagine is that Reflexivization does not apply between the subject of the sentence and the object of the infinitive construction (except, of course, in ii), thus suggesting that the infinitive still has some sort of sentential status. However, there is an alternative formulation of Reflexivization that avoids this problem. Reflexivization can be construed as applying between the arguments of the same _predicate_ rather than between the coreferential NP's within the same _simplex sentence_.

Under the suggested analysis, we have the option of considering either the first verb in the predicate construction alone or the whole construction V NP to V as the main predicate. This means that the notion of 'main verb' must be defined at a highly superficial level. This charac-teristic of the main verb needs some qualifications as the considerations involving the sentences in 4 have indicated. The main verb is determined on the surface or shallow level without considering the propositional attitude contexts or the modal indicators. This leads us to the second question, namely, what the structural requirement of a main verb is. In view of the data of the sort given in 5 iv and v above, it is clear that 'the main verb' is not always simple.

Now we will turn to the typical sentence for which Ross' constraints are motivated and see if the hypothesis under consideration can account for them.

(6) Complex NP Constraint
    (a) The hat which I believed the claim that Otto was wearing
        was red.
    (b) The man who I read a statement which was about is sick.

(7) Coordinate Structure Constraint
   (a) The boy who John acted as a translator between and his
       teacher was from Japan.
   (b) The boy who and my niece danced was handsome.
   (c) The man who and my niece the committee recommended as the
       most suitable couple did not like the job.

(8) Sentential Subject Constraint
   (a) The teacher who that the principal would fire was
       expected by the reporters is a crusty old battleax.

For the sentences in 6, the explanation for the ungrammaticality
is straightforward. The moved relative pronouns (those underlined)
obviously are not the arguments to the main predicate in the sense charac-
terized in the present work. The same explanation goes for the first
sentence in 7. The rest of the sentences in 7, however, are more problem-
atic. First of all, if we adopt Ross' explanation (cf. section 4.2.4.2
of Ross 1967), utilizing the notion of Chomsky-adjunction to justify the
postulation of a movement in the second sentence, the application of our
hypothesis will remain as simple; what we move and Chomsky-adjoin is
simply not an argument to the main predicate but only a part of an argu-
ment. However, I am not sure how the Chomsky-adjunction will work for the
third sentence in 7. If the whole constituent that is moved by Relativ-
ization is to be Chomsky-adjoined, the whole conjunction, not just the
relative pronoun, must be Chomsky-adjoined. But then there is no vio-
lation of the Coordinate Structure Constraint.

One might postulate some sort of identity condition between the ante-
cedent of a relative pronoun and the moved constituent within the relative
clause. The simpler formulation of the condition would be just to require
the two to be identical, coreferential, etc. This will, of course, take
care of the latter two sentences in 7. In 7b, the antecedent (= 'the boy')
and the moved constituent as an argument of the main predicate (= 'who and
my niece') are not strictly coreferential. The same applies to 7c. One
immediate problem is that this identity condition cannot account for the
obviously related oddness of the following sentences:

(9a) ?Who and your niece do you think will get married?
(9b) ?Who and your niece do you want to get married?

Both relative clauses and interrogative sentences can be constructed as
involving property definitions. The defined property is used in a relative
clause to narrow down the scope of reference of the antecedent, and in an
interrogative sentence to locate the object that satisfies it. One could
consider this in terms of the lambda operation(Montague 1974:257 and Partee
1975:240). One restriction is that the variable for which the property is
defined should be an argument to the main predicate in the sentence that
is used to define the property. Thus, in 9a, the property in question is
the property of x such that x and your niece will get married in the hearer's

belief world. Notice that x is not a main argument in that property definition, which fact explains why the sentences in 9 are odd. This condition needs further qualification as shown by the following sentences:

(10a) I don't like books the cover of which is red.
(10b) Those families at least one member of which is enrolled for the Army are qualified for rations.

Although we will not go into the exact formulation of the solution here, it seems that the condition is related to the problem involving possessive cases (cf. 11). Thus if the antecedent is not coreferential with the moved constituent, the relative pronoun seems to be in some possessive-related form.

(11) Orphans are children whose parents are dead.

The sentence 8 is different from 4b in that the sentential subject within the relative clause is asserted to have been expected rather than being asserted to have been the case in a certain modal context, i.e. in the set of possible worlds characterized by the shared expectations of a group of reporters.

While the definition of 'main verb' is much too vague as it stands, the present paper offers something to measure the degrees of grammaticality. In Ross' approach, if a sentence violates a constraint in its derivation, the sentence will be ungrammatical. The matter of degree of grammaticality cannot be directly dealt with in the formulation of the constraints. Most speakers I checked with judged the sentences below to be somewhat better than the sentences in 6-8:

(12a) I met a girl who there is not a single person in the whole world who can compare in beauty (with).
(12b) Burt's History of the Arts is one book that I have never met anybody who really enjoyed reading.

Many of those speakers felt that the following sentences, although admittedly ungrammatical, are somehow better than those in 1-3:

(13a) The book which John asked me whether I read was his latest novel.
(13b) Which book did John ask you whether you read?
(13c) His latest novel John asked me if I read.

(14a) The difficulties which my chief concern has been to point out are in the area of syntax.
(14b) What has your chief concern been to point out?
(14c) These difficulties my chief concern has been to point out.

(15a)　The book I would rather take a nap than read is Burt's
History of the Arts.
(15b)　What book would you rather take a nap than read?
(15c)　Burt's History of the Arts John would rather take a nap
than read.

If the reader finds any of these sentences just as bad, he simply has that
much more data that argue for the necessity of something of the sort of
the present approach. If he agrees with most of my imformants, the
grammaticality difference has to be explained. We have yet to discover
the principle that governs the formation of idioms and the degree of
idiomaticity, but whatever principle answers the questions of what makes
idioms idioms and what determines the degree of idiomaticity seems to be
closely related to the definition of main predicate.

In other words, in the present approach the question of why the
sentences above are viewed better can be asked in terms of what determines
the main verb or what type of information or construction may more likely
be viewed as a single main predicate. Obviously this does not answer the
question but at least we do not misrepresent the situation by claiming the
same degree of grammaticality as in the purely syntactically oriented works.

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