

The English Relative Clause*

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A computer grammar is described which includes most of the English relative-clause constructions. It is written in the form of a left-to-right phrase-structure grammar with discontinuous constituents and subscripts, which carry such syntactic restrictions as number and verb government category. The motivation for the hierarchy of syntactic choices and for the use of discontinuous constituents is discussed. Many examples are given, and special attention is given to complement constructions and to the relation of the relative pronoun to complex prenominal and post-nominal determiner constructions. Written in COMMIT, the program runs as part of a larger grammar of English.

I. Introduction

In English, a subordinate clause consists of two immediate constituents: the clause marker and the remainder of the clause. In the case of a relative clause these two constituents are termed the relative topic and the relative comment.

The relative topic is peculiar to the relative clause. It imposes restrictions on the form of the relative comment which are not found in other forms of clause. Moreover, because of the relative topic, the relative clause appears to differ significantly from other forms of subordinate clause.

The relative topic fulfills at least three functions within the clause. First, it is a form of clause marker. It identifies the specific form of subordinate clause. In this function the relative topic is similar to a word such as 'when' which introduces a type of adverbial subordinate clause, or to a phrase such as 'whether or not' which identifies one form of subordinate complement clause.

Second, the relative topic is pronominal in function. It explicitly refers to an antecedent which is not a part of the relative clause. In this way, the topic introduces into the relative clause those restrictions of the antecedent which can be expressed by pronominal reference. Thus, unlike other forms of subordinate clause, the constructions within the relative clause must be restricted to those which are coordinate with a construction of the containing clause.

Third, the relative topic fulfills a syntactic function within the relative clause. The construction which

would otherwise fulfill this function within the clause does not occur within the relative comment. The function could, for example, be that of the subject of the clause or an object of the clause.

All relative comments exhibit certain characteristics. First, obviously, the comment is restricted to those clause types which could, otherwise, include an element representing that particular syntactic function which, in the relative clause, is represented by the topic.

Second, there are several sentence patterns which cannot occur within any relative clause. These same patterns are also prohibited in at least some (and perhaps all) other forms of subordinate clause. These patterns include all forms of question construction, pro-predicates, and certain forms of inversion. Some of these restrictions are exemplified in the following paragraphs.

There are three forms of question in English. These forms are exemplified in the sentences:

Question word:	Who baked the cakes?
Inverted question:	Has she baked the cakes?
Tag question:	She baked the cakes, didn't she?

None of these constructions is permissible within a relative clause. The question-word construction appears to contradict this assertion because it is formally similar to those relative clauses where the relative topic includes one of the pronouns 'who,' 'whom,' 'which,' or 'whose,' for example:

The woman who baked the cakes sold them in the bakery at Main and 4th Streets.

However, the two constructions are not identical. They differ in intonation. Their role within a sentence differs. They include some different forms of construction and, therefore, are chosen from different substitution classes. A question-word construction is either an independent sentence:

Who baked the cakes?

or the complement of a governing verb:

John asked who baked the cakes.

* This article was drawn from D. Kathryn Weintraub, "The Syntax of Some English Relative Clauses" (unpublished Ph.D. Dissertation, University of Chicago, 1970). A limited number of copies are available for distribution to those who request them from Dr. Victor H. Yngve, Graduate Library School, University of Chicago. Microfilm copies may be purchased from the University of Chicago Library. Supported in part by the U.S. Office of Education and the National Science Foundation.

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while the corresponding relative-clause constructions are attributive to a noun (or pronoun). Thus the two constructions, even when formally similar, do not fulfill the same role within the sentence.

In addition, there are some forms of relative topic which are not acceptable constructions for questions. Thus the sentence

John bought the house of which the windows faced east

is acceptable, but neither of the corresponding question-word constructions is an acceptable sentence (I use the usual notation of an asterisk to identify a construction that is unacceptable because it includes one or more unacceptable pairs of constituents):

*Of which the windows faced east?

*John asked of which the windows faced east.

Instead, the corresponding question would be something like:

John asked of which house did the windows face east.

Finally, question-word sentences and relative clauses differ in what Elinor Charney has called their abstract meaning [1, p. 53]. The question-clause construction asserts that there is a person such that he or she has baked the cakes and asks for the identity of that person. The corresponding relative-clause construction either restricts the class of 'woman' to the one that baked the cakes or, if the clause is nonrestrictive, identifies 'the woman' (of whom there is only one within the universe of the discourse) as the one who, incidentally, baked the cakes. Thus, question-word structures, though similar to some forms of relative clause, are not identical.

It is immediately obvious that there are no relative-clause constructions which even superficially correspond to inverted questions or tag questions.

Almost all forms of a declarative sentence can occur within at least some types of relative clause. However, neither a proredicate nor an inverted construction can occur within the relative clause.

A propredicate is a form of coordinate clause that occurs with a declarative clause. Its predicate consists only of verbal auxiliaries and refers to the predicate of the main clause. Thus, for example:

The woman baked cakes and so did her daughter.

A relative clause of the form:

The woman who baked cakes sold them in the bakery at
Main and 4th Streets

is acceptable, but the corresponding relative clause with propredicate:

*The woman who baked cakes and so did her daughter
sold them in the bakery at Main and 4th Streets,

is not acceptable.

In addition to the question and propredicate constructions, certain forms of inversion also cannot occur in

relative clauses. Inversion here refers to a sentence structure in which the initial verbal auxiliary or the empty auxiliary 'do' precedes the subject of the sentence. For example, the sentence

Never has she baked a cake

is acceptable. However, it is not possible to write a sentence in which the relative clause exhibits a similar inversion:

*The woman never has who baked a cake purchased them frequently.

This study describes a large number of relative-clause types. These types are differentiated by the types of construction which occur within the relative clause. The study is limited, however, to those types of clause where the relative topic refers to the head of a noun phrase and where the relative topic functions syntactically either as a subject, direct object, or indirect object of the relative clause, or where the relative topic is a part of one of these three classes of construction.

II. The Form of the Grammar

The relative-clause types treated in this study were incorporated as a part of a larger grammar. The particular type of model used for this grammar is a phrase-structure model with discontinuous constituents. The model was first proposed by Victor H. Yngve [2, 3]. The grammar was recorded in the form of a computer program, using the COMIT programming language [4].

The phrase-structure model expands constructions from the top down. The sentences are generated in a left-to-right sequence: the leftmost constituent is always expanded first until, ultimately, a word is written out. Figure 1 outlines the expansions required to write out two sentences. The sentences are quite similar but the second includes a pair of discontinuous constituents.

A grammar of any complexity, obviously, permits the choice of more than one sentence type. A grammar which would generate the two sentences of figure 1 might also generate such sentences as:

They called the girl up.
He calls the girl up.

etc.

In order to describe these variant sentence types, the grammar includes 'choice' rules. These rules choose at random between sets of constructions which can substitute for one another within the same environment. Thus, for example, there are rules which choose at random between singular and plural number.

In this grammar, syntactic restrictions on constructions are added to the constituents in the forms of subscripts. The restrictions normally carry down to all subordinate constituents, but they may be deleted or changed by the use of explicit rules. Thus, for example,

in figure 1, a subscript specifying the singular number would have to be added to the constituent for *Sentence* before it is divided into the two constituents for *Subject* and *Predicate*. In order to permit a free choice between singular and plural objects, this subscript would have to be deleted from the constituent for object. This feature of the model has been described in greater detail by Harman [5].

"The Syntax of Some English Relative Clauses" was written as an extension of an existing partial grammar of English—"English Grammar Six."¹ The two grammars both conform to the same model and were written in the same programming language. They could run together as a single grammar. However, the actual tests of the relative-clause grammar were made with an abbreviated form of "Grammar Six" in order to reduce machine time and avoid the problems of calling different sections of the program from tape.

The relationship between the two grammars is complex. The relative-clause grammar is a part of the larger grammar. However, relative clauses may include many of the constructions described within the larger grammar. Thus, the relative-clause program utilizes returns to many portions of the larger grammar. In this sense, portions of the larger grammar are included within the relative-clause grammar. Thus, the list of constructions of "English Grammar Six" was used as a checklist for possible forms of internal constructions. Existing collections of relative clauses were also consulted in order to identify as many different patterns of relative clause as possible. The most important of these collections were those of Jespersen [6], Poutsma [7], and Robbins [8].

The program for "The Syntax of Some English Relative Clauses" is restricted to three types of information. First, it includes the inflection for relative pronouns. Second, it includes expansions into constituents for such pairs of constructions as the relative topic and the relative comment. Third, it organizes the constructions of "Grammar Six" into several sets of choices which are appropriate for different types of relative clauses. With the exception of relative pronouns and a few incompletely analyzed constructions, all constructions of the relative clauses are written out by the program for "Grammar Six."

Thus, there are two significant aspects of "The Syntax of Some English Relative Clauses." The first is the sequence of choice rules and expansion rules. This sequence is sometimes termed the flow of control. Diagrams of the flow of control for specific types of construction are more commonly called phrase-structure diagrams. The steps in the sequence of rules are deter-

¹ "English Grammar Six" was compiled as a group project over a number of years. The most recent form of the program, which is here referred to as "English Grammar Six," was compiled by Victor H. Yngve, Alan Perlman, Beverly Klassen, Holly Huber, Bart Jones, and Robert Binnick.

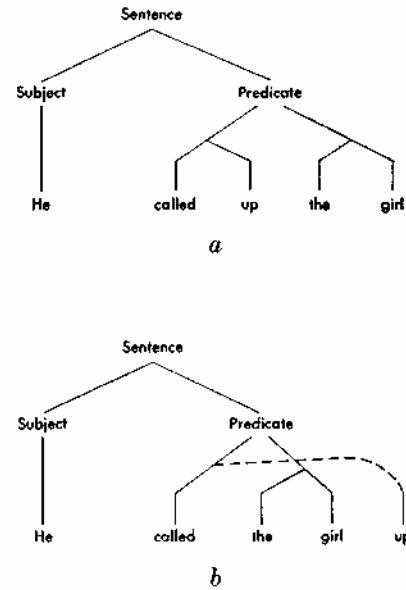


FIG. 1.—Illustration of phrase structure with (a) continuous constituents and (b) discontinuous constituents.

mined by the lists of subscripts and subscript values which each constituent must carry. These subscripts have the effect of imposing additional restrictions upon the choices of "Grammar Six." Those subscripts which are needed in order to coordinate restrictions on the expansion of more than one constituent are chosen before the construction is expanded into two constituents.

The second significant aspect of the syntax is the classification of constructions which the flow of control imposes upon "English Grammar Six." This organization is convenient for relative clauses. However, the constructions are not so organized in "English Grammar Six" nor in such older grammars of English as those of Jespersen and Poutsma.

The flow of control for "The Syntax of Some English Relative Clauses" is shown in figure 2. The part of the program for selecting the relative topic is divided into two sections, identified in figure 2 by 1 and 2. The syntactic function of the topic within the relative clause is a function of the relation between the topic and a verb within the clause. Accordingly, the first section of this part of the program selects those forms of comment which could include a noun phrase with the function of the topic. The second section of this part of the program selects the form and type of topic. After these choices have been made (and the appropriate lists of subscripts have been added to the constituent which represents a relative clause), the relative clause is split into its two main immediate constituents—the relative topic and the relative comment, represented by 3 and 4 in figure 2.

There are three main types of syntactic relation between the topic and the comment described in that portion of the grammar which corresponds to 1 of figure

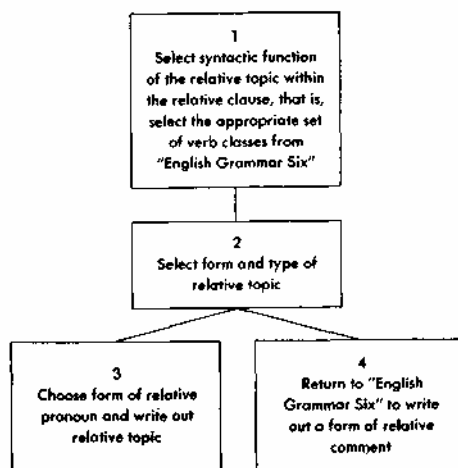


FIG. 2.—The flow of control in a program defining the "Syntax of Some English Relative Clauses."

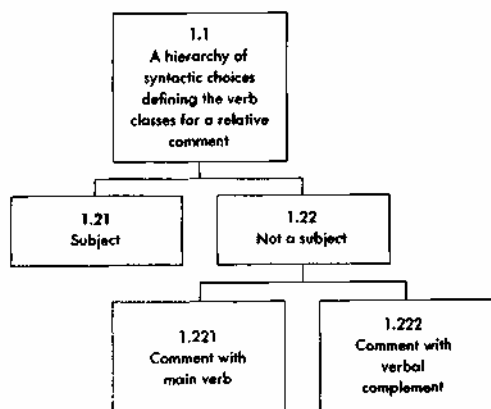


FIG. 3.—A hierarchy of syntactic choices defining the verb classes for a relative comment.

2. These are shown in figure 3. (The boxes in this figure and in those of the following figures which give the flow of control within the program are numbered to correspond with the boxes of fig. 2, and the members of a substitution class are identified in this and succeeding figures by drawing a horizontal line over the boxes which represent the members of that class.) When the relative topic is the subject of the relative clause (1.21 of fig. 3), there are no syntactic limitations on the type of verb in the comment and any subject can co-occur with any type of verb in the comment. This is true because semantic restrictions are not generally included in this grammar. The phrase structure for the clause will have the form illustrated in figure 4. (A triangle is used in a phrase-structure diagram to summarize the detailed expansion of a node.) In these constructions, control returns to the main grammar below the point at which a clause is expanded into the two constituents of subject and predicate.

If the topic is not a subject (1.22 of fig. 3), then there are several forms of restriction upon the comment.

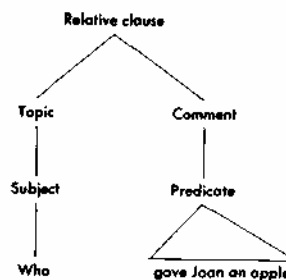


FIG. 4.—General form of phrase structure for a relative clause where the topic is the subject of the clause.

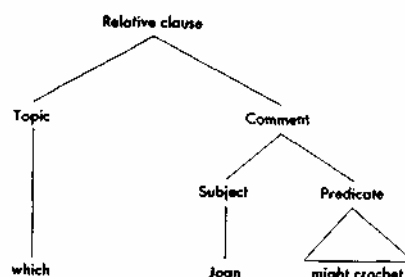


FIG. 5.—General form of phrase structure for a comment with main verb.

These divide into two main classes: those where the syntactic function of the topic is a function of its relation to the main verb within the comment:

John refused to wear any sweater which Joan might crochet

and those where the syntactic function of the topic is a function of its relation to the verb of the verbal complement within the comment:

John refused to wear the sweater which Joan had promised to crochet.

These two types are called 'comments with main verb' and 'comments with verbal complements.'

III. Comments with Main Verb

The general form of phrase structure for a comment with a main verb is outlined in figure 5. The flow of control returns from the relative-clause grammar to the main grammar at the same point for all of these constructions. The return is restricted in two ways. The choice of verb is limited (by means of subscripts) and, often, a deletion rule is defined to omit an object, indirect object, or agent of action for a passive construction. These deletion rules are included because this is the easiest way to combine the two grammars.

The types of comment with main verb are shown in figure 6. This figure is an expansion of 1.221 in figure 3, and the boxes of figure 6 are numbered to show this relationship.

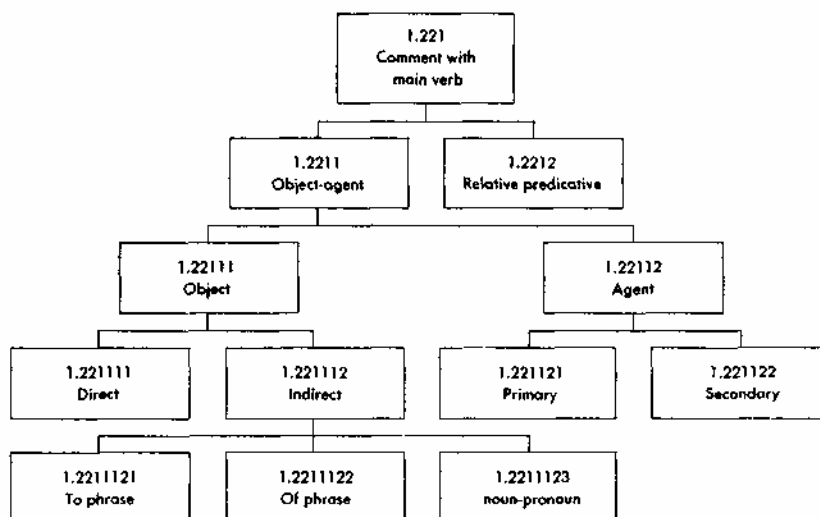


FIG. 6.—A hierarchy of syntactic choices defining the verb classes for a comment with main verb

The hierarchy of choices for a comment with main verb determines the syntactic function of the topic within the relative clause, and these choices also limit the main verb to one of those verb types which could govern such a noun phrase.

The first choice is whether the topic is a predicative or not. Predicatives are governed by the verb 'to be,' or by another form of copula, or by a double-object verb. A relative clause with a predicative is formally distinguished from other types of relative clause when the antecedent is a human noun. In this case the relative topic may include the relative pronoun 'which' but not 'whom.' For example:

- Joan was not really the brat which she seemed.
- His own mother would not have recognized the man which Dorian Gray became.
- Having become an outcast, which he was to remain throughout his career, John shaved his beard and clipped his flowing locks.
- John was not the scholar which his critics considered him.
- Genet became the thief which his stepparents called him.

It should be pointed out that relative predicatives do not completely correspond to simple sentences with the verb 'to be.' A declarative sentence with the verb 'to be' is formally ambiguous but the ambiguity is not present in the relative clause. Thus, in the sentence

Joan was the cook,

the phrase 'the cook' could refer to a specific person who happened to be Joan or it could be a phrase describing the person 'Joan.' This ambiguity has been discussed by W. K. Percival [9, p. 170] and, in a somewhat different context, by M. A. K. Halliday [10, p. 13].

There is no comparable ambiguity in these relative predicatives. If the antecedent is referential in meaning (if it refers to a specific person or thing) and if the clause is to include one of those verb types which gov-

ern predicatives, then the topic is the subject of the relative clause. If the antecedent is descriptive in meaning, then the relative topic is the predicative of the clause and the relative pronoun is nonhuman in form. The sentence

Bill recognized Joan for the cook which she was, but he married her anyway

is acceptable, but the combination of constructions

*Bill recognized Joan for the girl which was the cook

is not an acceptable sentence.

This situation is different for other verbs. In the case of double-object verbs and copulas, the form of the relative predicative does depend upon whether the antecedent is descriptive or referential in meaning. In some cases the topic could be either 'whom' or 'which,' for example:

She was not the librarian $\left\{ \begin{array}{l} \text{whom} \\ \text{which} \end{array} \right\}$ John had appointed head of reference thirty years ago.

Mr. Hyde was not the Dr. Jekyll $\left\{ \begin{array}{l} \text{whom} \\ \text{which} \end{array} \right\}$ he seemed to be.

The second choice outlined in figure 6 is between those topics which refer to the agent of a passive construction and those which refer to an object. Clearly, if the topic is an agent, then the relative clause is passive, but it may be either a primary or a secondary passive:

Primary: She knew the boy by whom Bill was hit.

Secondary: She knew the boy by whom Bill was taught French.

In the remaining types of comment with main verb, the topic assumes the form of an object. This object may be either direct or indirect. If the topic is an indirect

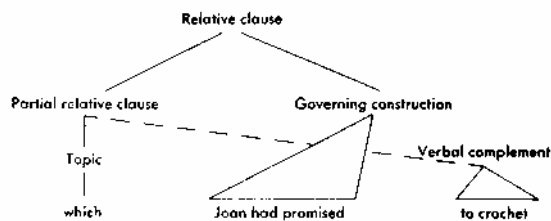


FIG. 7.—General form of phrase structure for a comment with verbal complement.

object, it is chosen from those forms which are governed by a preposition or from the form without a governing preposition. The following sentences are all acceptable:

- She had studied the language which John taught Bill.
- She saw the boy whom the apple was given to.
- The man whom Joan called a fool disliked rubber dolls.

IV. Comments with Verbal Complement

Returning now to figure 3, we have in the last section discussed 1.221, *comment with main verb*. We now turn to 1.222, *comment with verbal complement*.

A verbal complement may include any of a number of infinitive or subordinate clause types, for example:

Joan had promised to crochet a sweater.

A comment with verbal complement refers to a construction where the relative topic functions syntactically as a part of a verbal complement. Thus:

John refused to wear the sweater which Joan had promised to crochet.

In these constructions the relative clause has at least two verbs. In the above example 'promised' is the governing verb and 'crochet' is the verb within the complement. It is also possible to have a relative clause with more than two verbs where the verb within the complement is in turn a governing verb. Such constructions were not included in the program but could easily be added, as will be explained later.

Figure 7 shows the phrase structure for the relative clause of the above sentence. The verbal complement is defined as a discontinuous constituent with the relative topic. The choice of a discontinuous phrase structure for this construction rather than some other alternative without discontinuous constituents was made here because it most clearly reflects the necessary sequence of syntactic choices as recorded in the subscripts. The issues involved can be appreciated by considering the details of the flow of control as shown in figure 8, which correlates with the phrase-structure diagram of the example given in figure 7. The dashed lines in the two figures represent the way in which the second constituent of a discontinuous construction is postponed until after the *Governing construction*.

The first box of figure 8, 1.2221, represents a series of choices for various forms of relative clause having a

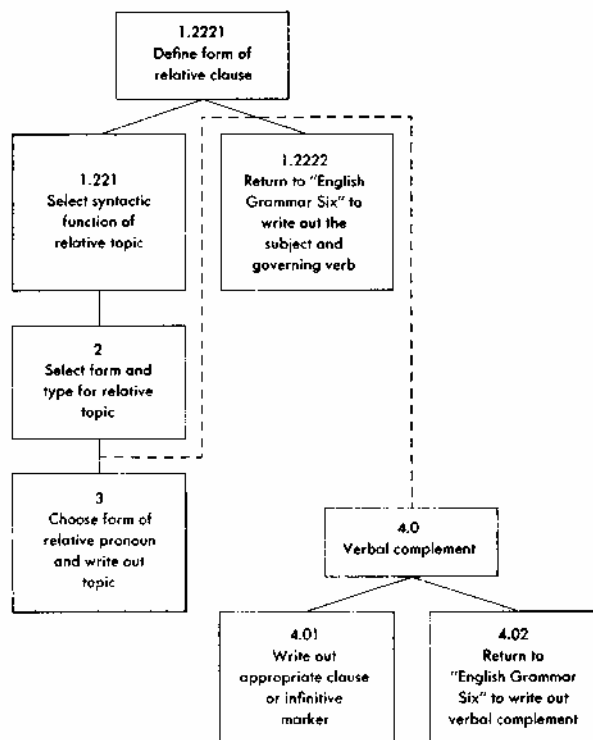


FIG. 8.—The flow of control in a program to write out a form of relative clause with a comment with verbal complement.

comment with verbal complement. Since, as has already been explained, there are no subject-verb restrictions in the grammar, the choice takes the form of a classification of verbs by form of complement, as detailed in figure 9. In our example sentence, the choices would have to be: 1.22212, *infinitive*; 1.222121, *direct object*; 1.2221211, *agent of infinitive is subject of relative clause* (i.e., *Joan*); and 1.22212111, *infinitive* (without additional markers, i.e., *to crochet*). These choices must be made before the relative clause is expanded into two constituents because they represent syntactic constraints between the governing construction on the one hand and the topic and verbal complement on the other.

After the expansion into the partial relative clause and the governing construction, further choices must be made to determine the syntactic function of the topic within the partial relative clause. These choices are made in 1.221 of figure 8. The choices needed are exactly the same as the choices we have already discussed for other relative clauses in the last section and illustrated in figure 6.

The program is now ready to expand the partial relative clause into a topic and a verbal complement in a fashion exactly analogous to the expansion of other relative clauses into topic and comment, but since the verbal complement must be postponed beyond the governing construction, it is treated as a discontinuous constituent.

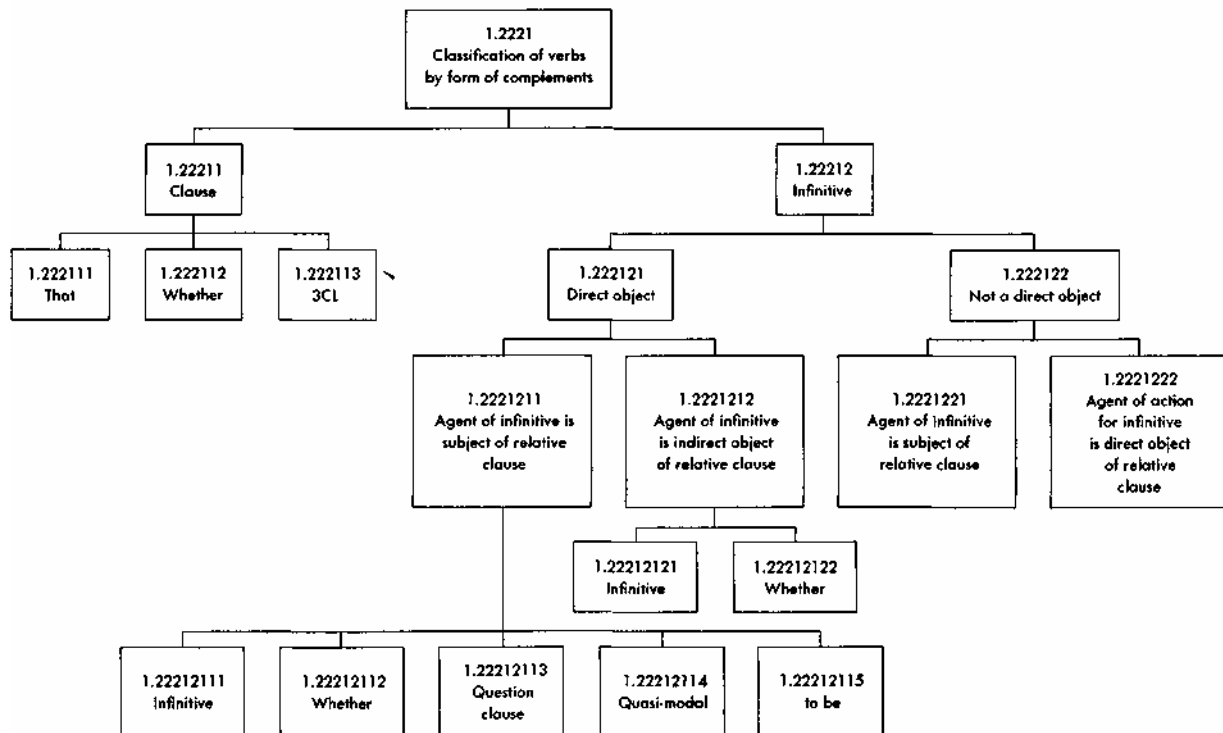


FIG. 9.—Classification of verbs by form of complement

In those cases where there are three or more verbs in the relative clause, a complement verb may be in turn a governing verb:

I was never able to read the book which Joan had promised me to ask Bill to give to John.

Although these forms are not included in the present grammar, all that would be necessary would be to add a choice rule. The grammar would first write out the subject of the clause. Then it would choose either to write out the verb governing the complement which governs the topic or to write out a form of verb phrase governing some other complement. In the latter case, before writing out the verb within the complement, the grammar could again choose whether this verb would govern the complement which governs the topic or some other verbal complement.

This form of relative clause (with complements governing complements) can easily involve problems of pronominal reference. Thus in the sentence

I was never able to read the book which Joan had promised me to ask Bill to give to John to return to the library,

the topic 'which' is apparently the object of both the verbs 'to give' and 'to return.'

We have already examined figure 9 in order to see which choices would be necessary in order to generate the relative clause diagrammed in figure 7. The choices of figure 9 summarize all those verb classes of "Grammar

Six" which could occur as the governing verbs in a comment with the verbal complement. For this purpose the verb types of "Grammar Six" are gathered into classes according to the form of complement which they govern.

The primary choice is between verbs which govern clauses and verbs which govern infinitives. If the complement is to be a clause, it is only necessary to know the form of the subordinate (or complement) clause. It could be a 'that-clause,' for example,

I missed the licorice which John reported that Joan had eaten,

or a 'whether-clause':

John had bought the licorice which I wondered whether Joan would eat or not,

or a '3CL.' A '3CL' is a form of complement defined in "English Grammar Six." It is governed by such copulas as:

to feel
to smell
to taste
to seem
to appear
to sound
to look

The clause consists of a clause marker and a declarative clause. The clause marker is either of the form 'like,' 'as

though,' or 'as if.' Thus an example of a '3CL' relative complement would be

Genet became the thief which he looked as if he were to his stepparents.

This form of clause complement appears far more acceptable (to me) if all of the verbal constructions within the relative clause are copulas. However, this restriction is not written into the program for relative clauses because "Grammar Six" permits all classes of verb within the '3CL' complement.

"Grammar Six" also defines another form of clause complement, a question clause. These complements are introduced by a clause marker in the form of a question word. However, the verb phrases differ in form from that of a verb phrase within a question. If the verb phrase includes auxiliaries, there is no question inversion. Even if there are no auxiliaries, the empty auxiliary 'do' is not permitted. The question word fulfills the customary function of a clause marker. It identifies a type of subordinate clause and restricts the form of the constructions within that clause.

No members of this class of subordinate clause were included in the class of comment with verbal complement. This is because I find all examples unacceptable. However, in his dissertation, "Constraints on Variables in Syntax," John Robert Ross [11, p. 27] does accept (with hesitation) the constructions exemplified by the sentences:

2.23 b He told me about a book which I can't figure

{ out why he read.
...
when I should read. }

c Which books did he tell you { why
...
when }

he wanted to read?

It might, theoretically, seem plausible that a relative topic could represent the same functions within a complement clause as it does within other forms of relative clause. This is almost true: the resulting relative clauses are often stylistically too long. An improvement can often be made by deleting the indirect object. The topic can function as a predicative, agentive phrase, indirect object, or direct object. Thus, though occasionally awkward, the following sentences all appear acceptable to me:

- Joan baked the apple pie which John told me that the man liked.
- We spoke to the man whom John had explained to me that the apple pie was liked by.
- John caught the fish which Bill asked me whether or not the man was eaten by.
- John caught the fish which Bill asked me whether the man ate or not.
- We spoke to the man whom the woman told the girl that she gave the apple pie to.

- John took a picture of the man whom Joan had told me that she asked directions of.
- John took a picture of the man whom Joan asked me whether or not I had asked directions of.
- John had known the man whom Joan told me that she had named librarian.
- John had known the man whom Joan asked me whether or not Bill had named librarian.
- John knew the man whom Joan asked Bill whether or not he had been taught German by.

The relative topic cannot, however, function as the subject of a complement clause. Although the following sentences are all acceptable:

- Joan had told me that Santa Claus was going to bring her an electric train for Christmas;
- Joan wondered whether Santa Claus would bring her an electric train for Christmas;
- It seemed as though Santa Claus would bring Joan a set of bongo drums for Christmas;

it is not possible to construct corresponding relative clauses where the topic represents the subject of the clause complement. So we see none of the following is an acceptable sentence:

- *We talked to Santa Claus, whom Joan had told me that was going to bring her an electric train for Christmas.
- *We wrote a letter to Santa Claus, who Joan wondered whether would bring her an electric train for Christmas or not.
- *We disliked Santa Claus, who it seemed as though would bring Joan a set of bongo drums for Christmas.

It appears that, when the complementary clause is introduced by a clause marker, this clause marker must be followed by a subject. It is probably not true, though, that the relative topic never represents the subject of a complementary construction. In both of the following sentences the relative topic appears to represent the subject of a complementary construction, and that complementary construction is distinguished from the above types by the absence of an overt form of marker:

We feed children whom we think are hungry. [6, p. 197]
I am going to exclude candidates who I do not think have the least chance of passing the examination.²

These latter constructions are not defined in the actual program for relative clauses because the appropriate predicates are not included in "Grammar Six."

"English Grammar Six" defines several types of infinitive complement. These can be most conveniently divided into those where the infinitive substitutes for a direct object and those where it does not. Both types of infinitive include all those classes of verb which govern, or co-occur, with predicatives, agentive phrases, direct objects, or indirect objects. The two types are

² From notes taken at a lecture ("Relative Clauses") by Peter Geach at the University of Chicago, December 12, 1967.

distinguished because it is necessary to define different forms of return to "English Grammar Six" for the governing verbs of these constructions.

Those infinitives which substitute for a direct object are of a number of forms. They can be simply an infinitive with 'to' or they may include a type of marker and an infinitive with 'to.' The markers defined in "Grammar Six" are 'whether or not,' question words, quasi-modals, and the infinitive 'to be.' If the agent of action is the subject of the clause the grammar chooses from all forms, but if the agent of the infinitive is the indirect object of the main verb, then the grammar chooses from infinitives without markers and those with 'whether or not.'

The following noun phrases illustrate some relative complements with infinitives and with infinitives introduced by 'whether or not':

The fish which John allowed Bill to eat. . . .

The fish by which John allowed Bill to be eaten. . . .

The fish which John asked me whether or not to eat. . . .

The fish which John asked me whether or not to be eaten by. . . .

The man to whom John promised to explain that the world is flat. . . .

The man to whom John asked Bill whether or not to give the fish _____

The man whom John promised me to ask directions of. . . .

The man of whom John asked Bill whether or not to ask directions. . . .

The man whom John promised Bill to name librarian. . . .

The man whom John asked Bill whether or not to name librarian. . . .

The man by whom John told Bill that he was advised to eat the fish. . . .

The man whom John promised Bill to be taught German by. . . .

"English Grammar Six" defines the same question words for question infinitives as it does for question clauses. Thus a question infinitive could be introduced by 'what,' or 'how,' 'where,' 'when' or 'why.' Those that begin with 'what' always form odd or unacceptable relative-clause constructions:

*We spoke to the mother whom John had asked me what to thank for. . . .

*John brought the box which Bill had asked Joan what to use for. . . .

They are excluded from the relative-clause grammar.

Most constructions from the second group are also unacceptable or marginal. However, some appear acceptable with the word 'how':

Euclid first formulated the theorem which John asked how to prove.

John caught the fish which Bill has asked the man how to overhear eating other fish.

Hence, this construction is included in the program for relative clauses, but it is more restricted in form than are comparable constructions of "Grammar Six." This

form of comment with verbal complement does not appear to function as a relative predicative. Thus, in a relative complement construction, a question infinitive does not choose from those verbs which govern predicatives, that is, from those copulas, the verb 'to be,' or those double-object verbs which govern a predicative. None of the following combinations of constructions is an acceptable sentence:

*He was a thief which Joan has asked Hannibal how to become.

*We spoke to the thief which Joan has asked Hannibal how to be.

*He became the senator which Joan has asked Hannibal how to consider his ideal.

*John was the man which Joan had told Hannibal how to appoint a senator.

This analysis of complement constructions in relative clauses was completed before seeing the comparable analysis of J. R. Ross [10, pp. 27-35], The two analyses do not agree on all details of question complements. Nevertheless they are similar and neither is fully satisfactory. It is usually awkward to relativize a noun phrase within a question complement. Yet it is possible in some instances. There are undoubtedly important subclassifications of question complements which have not yet been adequately defined.

Quasi-modals are a form of complement defined in "English Grammar Six." A quasi-modal is governed by the verb 'to be.' It consists of a quasi-modal marker and an infinitive. The markers included in the grammar are 'about,' 'going,' and 'supposed.' An example of a sentence with a quasi-modal complement would be:

John was about to tell Bill a ribald story when Joan modeled her bikini.

A corresponding relative-complement construction would be:

The story which John was about to tell Bill wasn't half so funny as the sight of Joan in a bikini.

The infinitive 'to be' governs verbs with the inflectional suffix '-ing.' However, in other respects these phrases are comparable to infinitives. They are included in this section of the program because, since the constructions are similar, this results in programming economies. The 'to be' form of complement is governed by the verb 'to be' or by one of a small number of copulas. An example of a relative complement of this form would be:

The hamburger which John appeared to be eating was really a plaster of paris studio prop.

Those infinitives which do not substitute for direct objects in "English Grammar Six" are not fully described here. They include infinitives with 'to':

The garden which John meant Jim to weed was five miles from the house;

verbal complements which occur in an infinitive form but without the introductory word 'to':

The story which Joan overheard John tell Bill was not true but it was funny;

and so-called purpose infinitives which can be introduced with the phrase 'in order':

The garden which John had hired Jim (in order) to weed was five miles from the house.

V. Forms of Relative Topic

The relative topic is always the first element of the relative clause. It includes a relative pronoun. In addition it may include some preceding modifying constructions. In many instances, however, those constructions which precede the relative pronoun may occur either within the topic or the comment.

TABLE 1
CLASSIFICATION OF WH-RELATIVE PRONOUNS

CASE	COUNT		
	Human	Nonhuman	Noncount
Subject	WHo	WHich	WHich
Object	WHo or WHom	WHich	WHich
Possessive	WHose	WHose	WHose

The syntactic function of the topic is always indicated by the omission of a comparable construction within the relative comment. In addition, this function may also be indicated within the topic by means of an introductory preposition and/or the inflectional form of a relative pronoun.

Agentive phrases and some indirect objects may be introduced by a preposition. Alternatively, the preposition may occur within the relative comment. The prepositions included within this grammar were 'by' for agentive phrases and 'to' or 'of' for the appropriate indirect objects. Thus, the following sentences are all acceptable:

John read about the man by whom the watch was stolen yesterday.

The man to whom Joan gave an apple pie yesterday died of food poisoning last night.

The man of whom Joan asked the road to Chillicothe yesterday was an Indian guide.

John read about the man whom the watch was stolen by yesterday.

The man whom Joan gave an apple pie to yesterday died of food poisoning last night.

The man whom Joan asked the road to Chillicothe of yesterday was an Indian guide.

Those relative pronouns that begin with the letters 'wh' are all inflected. When the relative topic consists solely of a relative pronoun, this inflection may indicate

the syntactic role of the topic within the comment. The inflectional forms are shown in table 1.

There are two general forms of relative topic—those in which the relative pronoun is attributive to some other noun within the relative clause and those in which it is not. For convenience, these two forms are labeled attributive topics and pronominal topics. They are illustrated by the following sentences:

Pronominal relative topic: The dog which is standing on the corner bit John.

Attributive relative topic: The man whose dog is standing on the corner is one of John's former friends.

Pronominal relative topics may include any of three forms of relative pronoun. These forms are labeled 'null,' 'that,' and 'wh-forms.' Examples of these forms are:

The man I saw was standing on the corner.

The man that I saw was standing on the corner.

The man whom I saw was standing on the corner.

There are some restrictions upon the choice of these forms. In restrictive relative clauses where the topic is not a subject, the topic chooses from all three forms a relative pronoun. When, in a restrictive relative clause, the topic is a subject, it chooses from the 'that' and 'wh-forms' of relative pronoun. In nonrestrictive relative clauses, the topic chooses only from the 'wh-forms' of relative pronoun.

In those pronominal relative topics where the antecedent is either a mass noun or a plural count noun and where the relative pronoun is a 'wh-form,' the pronoun may be a part of a partitive construction. In this case the pronoun is introduced by the partitive word 'of.' Such constructions require a quantifier either within the relative topic or within the relative clause. Some examples of topic with quantifier are:

- either of whom
- any of whom
- nearly any of whom
- all of whom
- half of which
- both of which
- some of which
- six of which
- some of the six of which
- some of the first of whom
- almost all six of which
- one of which

etc.

It should be noted that in those cases where the antecedent is a plural count noun, these relative topics may be either singular or plural. For example, although the topic 'either of which' is singular, the antecedent of the pronoun 'which' is a plural count noun.

TABLE 2
CLASSIFICATION OF FORMS FOR POSSESSIVE (AND/OR PARTITIVE) RELATIVE TOPICS

QUALITATIVE PARTITIVE		QUANTITATIVE PREMODIFIER		
		Yes		
		Quantitative Partitive		
		Yes	No	No
No	One of whose windows Two of whose windows Three of whose windows	Whose one window Whose second window Whose three windows	Whose window Whose windows	
	Either of whose windows Both of whose windows Some of whose sand	?All whose windows ?Both whose windows *Whose either window *Whose each window		
Yes	Six of the windows of which Either of the windows of which	Either window of which Both windows of which All windows of which One window of which	The window of which A friend of whose The face of whom	

NOTE.—The topics listed in this chart are illustrative of the different forms but this is in no sense an exhaustive list of examples for each form.

The quantifier may either introduce the noun phrase of the topic or occur in the normal position within the comment, so the following sentences are acceptable:

- A leprechaun searched for his gold, some of which had been found by Joan.
- A leprechaun searched for the gold of which some had been found by Joan.
- A leprechaun searched for his gold, some of which Joan had found.
- A leprechaun searched for the gold of which Joan had found some.

The partitive 'of does not appear acceptable within the comment when the topic is a pronominal topic:

*A leprechaun searched for his gold which some of had been found by Joan.

In an attributive relative topic the relative pronoun functions either as a definite determiner in a noun phrase or it expresses a possessive and/or partitive relation between its antecedent and another noun (or noun phrase) within the relative clause. This latter noun is a common noun.

The word 'which' is often used attributively as an article. For example:

He read John Henry's book, which book pleased him very much.

In such constructions the word 'which' substitutes for a definite article (e.g., 'the' or 'that,' etc.) and combines the functions of pronoun and definite article. The head noun of the relative topic is usually identical in form and referent with the noun which is the antecedent of the relative topic. Thus, in the above sentence, the relative topic 'which book' means that book which

is exactly as specified in the antecedent noun phrase, namely 'John Henry's book.' If the head noun of the topic is not identical with its antecedent, then there is a close semantic relationship:

She became a librarian, which profession suited her well.

These clauses are always nonrestrictive. They make an incidental assertion concerning a topic which was previously specified by the antecedent. They are excluded from the grammar because they involve problems of semantic coordination between nouns which are beyond the scope of "English Grammar Six."

There are several forms of attributive topic where the relative word expresses a possessive and/or partitive meaning. These forms are collectively identified as possessive relative topics. They are summarized in table 2.

Possessive relative topics can be divided into those where the relative word precedes a noun that is within the same construction and those where it does not. In the former case the noun which refers to that which is possessed or is a part of the antecedent is always included within the relative topic. The relative word is always of the form 'whose' regardless of the antecedent. The word 'whose' replaces a definite article in the noun phrase, so the word 'whose' is pronominal, expresses a possessive meaning, and replaces a definite determiner. In the sentence:

She told the mother whose daughter sniffed glue that LSD was better,

the topic 'whose daughter' refers either to the mother's only daughter or to a definite or particular daughter—one who has already been specified in the previous discourse.

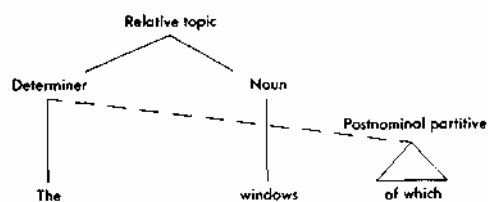


FIG. 10.—Phrase structure of a relative topic with a postnominal partitive expression.

These frames may be either restrictive or nonrestrictive:

- We walked along the beach, whose sand was coated with oil.
- The ancient mariner told of a ship whose deck was rotted through.

The constructions may include quantitative premodifiers. These quantitative premodifiers could be some form of cardinal or ordinal number:

- She told the woman whose fifteenth daughter sniffed glue that LSD was better.
- The ancient mariner told of a ship whose three wooden decks were rotted through.
- ?We toured some old buildings, all whose architects were of the Chicago school.

Alternatively, the quantitative premodifiers could be some form of partitive construction. As previously stated in connection with pronominal topics, quantitative-partitive topics appear to occur only in nonrestrictive clauses. A few examples of such clauses are:

- We shot an old farmer, almost all of whose cows had been grazing in our pasture.
- John walked along a beach, much of whose sand was coated with oil.
- John bought a house, three of whose windows faced east.

Some people will accept a quantifier within the relative comment:

- ?The ancient mariner told of a ship, of whose decks three were rotted through.
- ?John bought the house of whose windows six faced east.

These are not included in the actual program because they are not in my dialect.

The remaining forms of possessive topic all include a relative pronoun which expresses a partitive meaning and is often preceded by the partitive 'of.' In these topics the relative word is of the form:

- which
- whom
- whose

If the noun is included within the relative topic these constructions function as a postnominal modifier. They are defined as a discontinuous constituent of the determiner structure for the noun phrase. This is because

they agree with the antecedent although they are preceded by the head noun of the relative topic. Thus, in the sentence:

John bought the house on May Street, the windows of which faced east,

the relative topic is assigned the structure shown in figure 10. Unlike the preceding forms of attributive topic, these partitive constructions do not substitute for a determiner (or article). They serve only to indicate the relation between the antecedent and a noun phrase within the relative clause. They are called qualitative partitives here in order to distinguish them from quantitative partitives.

These topics are far more common with a relative pronoun of the form 'which.' This frame is only permitted when the antecedent is nonhuman:

- The ancient mariner told of a ship, the deck of which was rotted through.
- John walked along a beach, some sand of which was coated with oil.

Some native speakers consistently prefer the form 'of which' to a corresponding form of topic with 'whose' whenever the antecedent is inanimate. Other native speakers, however, prefer to use the corresponding form with 'whose' because, they say, it is shorter. Most native speakers make no differentiation. The program generally permits a free choice between either of the following forms:

- The odd old lady pointed to a room the doorway of which was veiled by cobwebs.
- The odd old lady pointed to a room whose doorway was veiled by cobwebs.

The relative topic may include both the noun phrase and its postnominal modifier, or the partitive construction, or the relative pronoun alone. For example:

- Joan had crocheted the sweater, the design of which John criticized.
- Joan had crocheted the sweater of which John criticized the design.
- Joan had crocheted the sweater which John criticized the design of.
- The ancient mariner told of a ship the deck of which was daily swabbed.
- The ancient mariner told of a ship of which the deck was daily swabbed.
- The ancient mariner told of a ship which the deck of was daily swabbed.
- The ancient mariner told of a ship, the deck of which the sailors daily swabbed.
- The ancient mariner told of a ship of which the sailors daily swabbed the deck.
- *The ancient mariner told of a ship of which the deck the sailors daily swabbed.

The clauses where the relative topic consists only of the partitive phrase are often infelicitous. Still they

occur. If the noun phrase referring to a part of the antecedent includes another postnominal construction, this form of topic often proves more readily acceptable:

Joan bought a sweater of which the extremely intricate design of fish and fowl had been copied from an old Icelandic manuscript.

John bought a house of which those windows which faced east were painted blue.

The noun phrase which refers to a part of the antecedent can be definite or indefinite but it must include an overt form of determiner. In "English Grammar Six" both plural count nouns and mass nouns may take a null determiner in an indefinite noun phrase. In this way, the words 'sand' and 'pencils' do not necessarily require a determiner:

It is easy to skid when driving on sand.

Pencils with worn down erasers should be saved for use in the public catalog room.

However such null determiners are not acceptable in a possessive relative topic:

*John walked along a beach, sand of which was coated with oil.

*John bought a house, windows of which faced east.

Instead, if the noun phrase is indefinite, the determiner must express an indefinite quantity:

John walked along a beach, some of the sand of which was coated with oil.

John bought a house of which many of the windows faced east.

The two possessive frames with partitive constructions 'of whom' and 'of whose' are frequently termed infelicitous. Yet, they occur occasionally. Poutsma cites some instances:

'An old gentleman ... a humble relation of whose I married . . . was seized with a fit and went off.' [7, p. 959]

'He charged the sum which he disbursed for the seats to the account of the widow and the young scapegrace of whom he was guardian.' [12, chap. 1, as cited in 7]

They offer a further specification of meaning which may prove occasionally useful and both refer to a human antecedent, but they express different forms of possessive relationship between the antecedent and the relative noun phrase. The phrase, 'of whom,' is used when the relative noun phrase refers to an inalienable possession of the antecedent; the phrase, 'of whose,' refers to an alienable possession of the antecedent. Thus, 'of whom' is used when the noun phrase refers to such categories as a part of the body or, by extension, to a relative or a servant if the relation is viewed as unalterable. The phrase, 'of whose,' is used when the

relation is thought of as more casual or if the relative noun phrase is nonhuman. The following sentences provide some further examples:

He wanted to paint a Helen, the face of whom would launch a thousand sails in Jackson Park Lagoon.

He told the co-ed, all the friends of whom worked hard for their grades, that camping outdoors was lots more fun.

She told the mother, a daughter of whose sniffed glue, that LSD was better.

We met an astronomer, a book of whose defined astrology.

*We met an astronomer, a book of whom defined astrology.

The phrase 'of whose' occurs only when the relative noun phrase is indefinite. When the noun phrase is definite, the word 'whose' substitutes for the definite determiner in the prenominal modifying construction. Thus:

*She told the mother, the daughter of whose sniffed glue, that LSD was better.

She told the mother, whose daughter sniffed glue, that LSD was better.

These relative topics state that there is something (e.g., a daughter) without explicitly stating whether there are others. The sentence:

She told the mother, one of whose daughters sniffed glue, that drugs were a sign of the times

states explicitly that the mother had other daughters, while the relative topic:

. . . , a daughter of whose . . . ,

refers to one daughter without specifying whether there are others.

It is doubtful whether the 'of whose' possessive relative frame occurs when the topic is plural. Such a frame would be of the following form:

?We talked to an author, some books of whose were published by A. Knopf.

The following frame appears always preferable:

We talked to an author, some of whose books were published by A. Knopf.

It should be emphasized that the two frames with 'of whom' and 'of whose' are only marginally acceptable. For many native speakers they are unacceptable. Nor did they occur in the daily issues of the *New York Times* during a period of several weeks when I clipped examples of relative clauses. They were included in this grammar for the sake of completeness.

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