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ABSTRACT

Data on the complexity of relative clause formation in children indicate that right embedding precedes central embedding in development. Previous research on the subject argues that configurations where coreferential NP's function as subjects are less complex than configurations where coreferential NP's function as objects. It appears that the most elementary relative is one where the nominal subject of the embedded relative is equivalent to either the nominal object or the nominal subject of the main clause. A proposed development sequence, where O is object and S is subject, is OS, SS, OO, SO. A study to determine the prerequisites to relative clause formation in children aged 29 to 36 months, and to test previous research, was undertaken. Forty test sentences, 10 of each of the above types, were given to 10 children and imitation was elicited. Results generally supported prior research, and it might be proposed that the ontogeny of relative clause formation in part consists of a prerequisite ability to process conjoined simplex propositions with coreferential NP's functioning as subjects of the embedded relatives. (CK)

RELATIVE CLAUSE FORMATION BETWEEN 29-36 MONTHS: A PRELIMINARY REPORT

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In general, developmental data on the complexity of relative clause formation (RCF) are in line with the basic experimental data obtained with adult subjects. The apparent order of emergence is right embedding (RE)→ central embedding (CE). There is data indicating that the ability to process conjoined simplex propositions with coreferential NP's precedes but may not necessarily be a prerequisite to RCF (e.g. Slobin & Welsh, 1973; Limber, 1973; Greenfield et al., 1972). A likely question then is the following: can the ontogeny of RCF be in part explained by a prerequisite ability to process conjoined simplex propositions with coreferential NP's? Judging from the implications of Thompson's (1971) conjunct analysis of RCF (where it is claimed that both relative clause types are derived from underlying sentential conjuncts), a related question is: at the outset of RCF, is the distinction between relative clause types transparent ("out of awareness"), the resulting being that what eventually came to be realized as restrictive and nonrestrictive relatives are initially analyzed in the fashion of sentential conjuncts?

Like the general experimental studies, many of the developmental studies of RCF have emphasized the processing and/or "attempts" at processing (via elicited imitations) of CE's. Such an emphasis is curious, especially when considering that CE's, which violate the "integrity" of the main clause (Bever, 1970; Slobin, 1973), are more complex than RE's and that there are indications that children produce (hence, probably comprehend) RE's before they produce CE's. Nonetheless, perhaps due to the need to test the results of adult studies, the developmental studies of Gaer (1969), C. Smith (1970), Gordon (1972), and Baird (1973), do not include a systematic assessment of RE's. In contrast, studies by D. Brown (1971), Noizet et al. (1973), and Sheldon (1973) included an assessment of both RE's and CE's (their subjects ranging in age from 3 - 11 years).

Noizet et al. and Brown argue that the processing and/or production of both RE's and CE's is facilitated if the coreferential NP's function as subjects of what come to be the embedded relatives, with RE's in general being easier than CE's. Their data suggest that underlying configurations, equivalent to (1) and (2), where coreferential NP's function as subjects (hereafter referred to as OS and SS types), are

less complex than configurations like (3) and (4), where coreferential NP's function as objects (hereafter referred to as OO and SO types).

(1) NP_1 V NP_2 —— NP_3 V NP_4

Obj. —— Subj.

(2) NP_1 V NP_2 —— NP_3 V NP_4

Subj. —— Subj.

(3) NP_1 V NP_2 —— NP_3 V NP_4

Obj. —— Obj.

(4) NP_1 V NP_2 —— NP_3 V NP_4

Subj. —— Obj.

It appears then that the most elementary relative is one where the nominal subject of the embedded relative is equivalent to either the nominal object or the nominal subject of the main clause (see also Baird, 1973). OS and SS types like (5) and (6), then, ought to be less demanding than OO and SO types like (7) and (8). (Note that in the currently available developmental studies real nouns and not nonsense nouns were used; the nonsense forms were used in a study that will be discussed shortly.)

(5) OS ——— The grig pets the tort that kisses the fiz

O — S

(6) SS ——— The grig that pets the fiz kisses the tort.

S — S

(7) OO ——— The grig pets the tort that the fiz kisses.

O — O

(8) SO ——— The grig that the fiz pets kisses the tort.

S — O

The results of the Noizet et al. and Brown studies bear out predictions based on Bever's (1970) NVN strategy and Rosenbaum's (1967) minimal distance principle (MDP). The NVN strategy predicts that RE's (OS and OO types) as opposed to CE's (SS and SO types)

facilitate processing because they do not interrupt the main clause, and thus allow the constituent clauses to be processed in a NVN or Agent-Action-Object fashion. In the case of RCF, the MDP predicts that the N which immediately precedes an embedded clause will be interpreted as subject of the embedded clause (providing the embedded clause begins with a relative pronoun). When combined, the NVN strategy and the MDP predict that RE's with coreferential NP's functioning as subjects (OS) are the least complex; RE's with coreferential NP's functioning as objects (OO) are more complex because they block application of the MDP. With CE's, those with coreferential NP's functioning as subjects (SS) are less complex than those with NP's functioning as objects (SO) because they permit application of the MDP and also permit a "restricted" application of the NVN strategy. Overall, the prediction is that RE's are less complex than CE's because both types of RE's (OS and OO), as opposed to both types of CE's (SS and SO), can be dealt with by the NVN strategy, a supposedly more primitive device than the MDP.

To be more precise, when each type is considered individually (apart from their being either RE's or CE's) a possible developmental sequence is OS→SS→OO→SO. Such a trend might be expected because (a) OS types as in (5) can be dealt with by both the NVN strategy and the MDP, (b) SS types as in (6) can be dealt with by both the NVN strategy and the MDP, but not with the same success as in the OS type because confusion is likely to be encountered upon re-entering the main clause where the NVN strategy and the MDP may be applied in a simultaneous and misleading fashion, (c) OO types as in (7) can be dealt with by the NVN strategy but not by the MDP, and (d) SO types as in (8) cannot be dealt with by either the NVN strategy or the MDP. Even though they prohibit closure, SS types do not necessarily block the NVN strategy. Consider (6) where the embedded clause can be properly analyzed by a suitable combination of the NVN strategy and the MDP, but complications may follow when re-entering the main clause where the MDP proves to be inadequate. A strategy that may be used (as implied in Slobin & Welsh, 1973) is to insert the conjunction "and" and consider the subject of the main clause to also be the (extraposed) subject of the embedded clause. The general assumption here is that the OS and SS types are less complex than the OO and SO types because their superficial structures suit the NVN strategy, the MDP and, hence, conjunct analysis -- with OS types being the most suitable of the two. That is, as suggested in Noizet et al. (1973), Baird (1973), and D. Brown (1971), OS and SS types seem to be less complex because they can be analyzed as conjoined simplex NVN sequences with coreferential NP's.

The proposed developmental sequence (OS→ SS→ OO→ SO), however, is not supported in Sheldon's (1973) study. Sheldon argues that RCF is facilitated by parallel functioning, where in CE's the coreferential NP functions as subject and in RE's the coreferential NP functions as object (in parallel with the head NP). It follows then that sentences modeled on (6) and (7) as opposed to those modeled on (5) and (8) should be less difficult. Sheldon also argues that when parallel function is maintained, there is no significant difference between CE's and RE's, hence questioning the principle that when the integrity of the main clause is violated processing is impeded. It is apparent then that Sheldon's data question the combined role of the NVN strategy, the MDP and, hence, conjunct analysis.

Because Sheldon's data represent a comprehensive argument against the results and/or implications of previous developmental studies, all of which (including Sheldon's) dealt with children beyond age three, a study was designed to determine what might be the prerequisites to RCF among children rangin in age from 29 to 36 months, an age range which may be more suitable if we want to study the development of RCF (e.g., see Menyuk, 1969; Limber, 1973; Slobin & Welsh, 1973).

Following Slobin and Welsh (1973), Baird (1973), and C. Smith (1970), an elicited imitation task was used in an effort to determine how very young children attempt to process relative clause sentences modeled on sentences (5) - (8). Unlike previous studies, nonsense nouns were used in order to minimize the effects that familiar nouns might have on efforts to process surface representations. All of the test sentences were beyond the production span of each subject. Across a number of experimental sessions, a total of forty test sentences (ten of each type -- OS, SS, OO, SO) were presented to each subject. The subject population consisted of ten children, five in group one (mean age of 30 months) and five in group two (mean age of 35 months). Unlike previous developmental studies of RCF, an attempt was made to control also for mean length of utterance (MLU). In spite of age differences, all ten subjects were at the upper end of R. Brown's (1973) Stage III. To rule out a "set" effect (where after being exposed to a successive number of similar models a subject might begin to respond in a consistent and misleading manner), syntactically simple filler sentences were used, half of which were equal in length (number of morphemes) to the test sentences.

Of primary interest was the question of whether or not children between the ages of 29-36 months are more capable of dealing with test sentences which suit the NVN strategy and the MDP (i.e., OS and SS types). In order for a response to be scored as correct, the the relationships among the NP's had to be maintained. Reminiscent of Slobin & Welsh's (1973) observations, there was a tendency to

respond initially with sentential conjuncts. For example, in both OS and SS types as in (5) and (6) correct responses were often of the form "The grig pets the tort (and) the tort (he) kisses the fiz" or more abbreviated versions for OS types, and "The grig pets the fiz and kisses the tort" or in more abbreviated versions for SS types. If, as in the case of SS types, the embedded relative was omitted, a probe was used where the child was asked to repeat his response (and, if necessary, the model was again provided). If, as in OS types, responses contained a pronoun with which to mark the subject of the second (or embedded) clause, probes in the form of questions were used to determine the pronoun's referent (e.g., "Who kissed the fiz, the tort or the grig?") Likewise, probes were used if a subject initially responded in relative clause form, whether or not NP relationships were maintained. For example, when a response in relative clause form occurred, the subject was asked to repeat his response. Again reminiscent of Slobin & Welsh (1973), repeated responses were generally in the form of conjuncts.

Overall, as illustrated in Table 1 below, the data obtained via elicited imitations combined with probes (possibly assessing "attempts" at comprehension) argue that overall RE's are significantly less complex than CE's. The data also argue that individually OS types are the least complex, followed in increasing order of complexity by SS, OO, and SO types, with SO types being by far the most complex. The total means for all ten subjects (collapsed as there were no significant age group differences) do not directly support Sheldon's parallel function as applied to RCF (the difference was in the right direction but not significant). The total means do favor the NVN strategy, the MDP, and hence, conjunct analysis — with those types (OS and SS) whose structures best suit the combined application of the NVN strategy and the MDP being much less complex than those types (OO and SO) which block such combined applications. (As might be expected, there were initially correct responses in relative clause form for which correct conjunct forms could not be obtained upon probing, especially among the older subjects. However, such responses did not occur with sufficient frequency to warrant detailed analysis.)

Table 1. Total Means

(1) RE's - CE's	OS & OO →	SS & SO
	6.0 →	4.2 (signif.)*
(2) PF	SS & OO →	SO & OS
	5.3 →	4.9 (nonsignif.)
(3) NVN & MDP	OS & SS →	OO & SO
	7.10 →	3.10 (signif.)*

* Statistical test used was analysis of variance; significant beyond the .001 level.

By using a combination of elicited imitations and probes, data was obtained in support of the findings and/or implications of previous developmental studies of RCF (with the exception of Sheldon's study). The adult and developmental studies of RCF have much to say about the general complexity of RCF but little to say about the form of the representations underlying relative clause sentences. On the basis of the data just discussed, it might be proposed that the ontogeny of RCF in part consists of a prerequisite ability to process conjoined simplex propositions with coreferential NP's which function as subjects of the embedded relatives. If we are allowed the assumption that the child's task is to impose structure (in line with his current level of functioning) upon the test items, it is interesting to note that there are interesting parallels between Thompson's (1971) conjunct analysis and developmental data on RCF. For example, at the outset of RCF it may be that the distinction between relative clause sentences is transparent (or, in Thompson's terms, superfluous) and, therefore, not crucial. Consider that relative clause sentences are first analyzed in the fashion of sentential conjuncts with coreferential NP's, with those types (OS and SS) which are more transparent (due to their structures suiting combined applications of the NVN strategy and MDP) being more accessible to the imposition of structure on the child's part. As a final comment, it ought to be mentioned that from the standpoint of how semantic information is distributed across structures, OS and SS types are less complex than OO and SO types and, hence, ought to be easier to process (impose structure). The prediction is that those types (OS and SS) with low semantic compression, where according to C. Smith (1970) semantic information is fairly evenly distributed across a structure (perhaps reflected in the degree to which their structures facilitate combined applications of the NVN strategy and the MDP), will be acquired earlier than those with high semantic compression.

REFERENCES

Baird, R. "Structural characteristics of clause-containing sentences and imitation by children and adults." Journal of Psycholinguistic Research, 1973, 12, 115-127.

Bever, T. "The cognitive basis for linguistic structures." In J. Hayes (ed.), Cognition and the development of language. New York: Wiley & Sons, 1970.

Brown, D. "Children's comprehension of relativized English sentences." Child Development, 1971, 42, 1923-1936.

Brown, R. A first language: the early stages. Cambridge, Mass.: Harvard University Press, 1973.

Gaer, E. "Children's understanding and production of sentences." Journal of Verbal Learning and Verbal Behavior, 1969, 8, 289-294.

Gordon, A. Psychological and linguistic complexity in child language. Unpublished doctoral dissertation, Stanford University, 1972.

Greenfield, P., K. Nelson, and E. Saltzman. "The development of rulebound strategies: A parallel between a ·on and grammar." Cognitive Psychology, 1972, 3, 291-310.

Limber, J. "The genesis of complex sentences." In T. Moore (ed.), Cognition and language development. New York: Academic Press, 1973.

Menyuk, P. Sentences children use. Cambridge, Mass.: M.I.T. Press, 1969.

Noizet, G., F. Deyts, and J.P. Deyts. "Producing complex sentences by applying relative transformations." Linguistics, 1972, 89, 49-68.

Rosenbaum, P. Grammar of English predicate constructions. Cambridge, Mass.: M.I.T. Press, 1967.

Sheldon, A. "The role of parallel function in the acquisition of relative clauses in English." University of Minnesota Working Papers in Linguistics and Philosophy, 1973, 1, 175-187.

Slobin, D. "Cognitive prerequisites for the development of grammar." In C.A. Ferguson and D.I. Slobin (eds.), Studies of child language development. New York: Holt, Rinehart & Winston, 1973.

Slobin, D. I. & C. Welsh. "Elicited imitation as a research tool in developmental psycholinguistics." In C.A. Ferguson and D.I. Slobin (eds.), Studies of child language development. New York: Holt, Rinehart, & Winston, 1973.

Smith, C. "An experimental approach to children's linguistic competence." In J. Hayes (ed.), Cognition and the development of language. New York: Wiley & Sons, 1970.

Thompson, S. "Relative clause structures." The Ohio State Working Papers in Linguistics, 1970.

Thompson, S. "The deep structure of relative clauses." In C. Fillmore and D. T. Langendoen (eds.), Studies in linguistic semantics. New York: Holt, Rinehart & Winston, 1971.