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AUTHOR Schwarte, Barbara S.
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ABSTRACT

The acquisition of English sentential complementation by adult native speakers of Finnish was investigated. Forty-three Finnish university students were administered a written test consisting of production tasks, subcategorization and syntactic categories, and comprehension items. Cross sectional data were analyzed to determine whether an invariant learning sequence exists for the sentential complement structures. Students' use of these structures was also analyzed longitudinally over a 9-month period. Although the cross-sectional group data indicated the existence of a learning sequence, longitudinal analysis demonstrated that progression through this continuum varies between individuals. It is concluded that future research should place more emphasis on longitudinal data rather than accept cross-sectional findings as indicative of the existence of a set learning sequence over time. (RW)

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THE ACQUISITION OF ENGLISH SENTENTIAL COMPLEMENTATION BY ADULT SPEAKERS OF FINNISH

by
Barbara S. Schwarte

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PREFACE

The research reported here is, in essence, the doctoral study I did as a graduate student in linguistics at the University of Illinois, Urbana-Champaign. The data was collected while I was an assistant lecturer in the English Department of the University of Jyväskylä, Finland (1974-1975). I am very grateful to Professor Kari Sajavaara of the University of Jyväskylä for his cooperation in allowing me to conduct my research and to my subjects for their willingness to participate in the study. I am also deeply indebted to my committee members - professors Michael Kenstowicz, Wayne Dickerson, and Howard Maclay. Other people who contributed to this study include Joan Mills, who assisted in the statistical analysis, and Eino Aaltonen, who assisted with the Finnish analysis.

Jyväskylä Cross-Language Studies
Department of English, University of Jyväskylä
edited by
Kari Sajavaara and Jaakko Lehtonen
+++
Assistant to the editors
Hannele Heikkinen

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CHAPTER 1

INTRODUCTION

The study reported on here was an investigation into the acquisition of English sentential complementation by adult native speakers of Finnish. A written test, consisting of six production tasks which included thirteen subcategorization categories and six syntactic categories and a small comprehension section, was administered to forty-three Finnish students at the University of Jyväskylä, Finland, during 1974-75.

The study consisted of two parts. The first part was a cross-sectional analysis to determine if there was an invariant learning sequence for the sentential complement structures. Recent second language acquisition studies have shown that such invariant learning sequences exist for morphemes and negation (Dulay and Burt 1973, 1974; Bailey, Madden and Krashen 1974; Hyltenstam 1977). The hierarchy of difficulty found for the Finnish speakers was compared with that of another study which investigated the acquisition of English sentential complement structures by adult Puerto Rican students (Anderson 1976) in order to determine whether or not the invariant difficulty sequences are comparable between the two language groups. In studies by Krashen, Sterlazza, Feldman and Fathman (1976) and Larsen (1975), the learning sequences were the same across language groups.

The second part of the study looked at the students' use of these complement structures over a nine-month period. In particular, an analysis was made to see if the cross-sectionally derived ordering of difficulty reflected the subjects' difficulty with these items over time. A study by Rosansky (1976) indicated that longitudinal rankings do not match cross-sectional rankings. The study also included an investigation into the degree of individual variation; that is, how closely the ordering for one subject over time compares with the longitudinal rankings for the other subjects. Researchers who have also looked at this question include Rosansky (1976), Bertkua (1974), and Krashen, Houch, Giunchi, Bode, Birnbaum, and Strei (1976). If it is found that longitudinal rankings do not match cross-sectional rankings due to individual variations, this would be an indication that individual differences in language acquisition are being obscured by group data. Such an indication would

have significant implications for further second language acquisition research. Another issue addressed in the study was the prevalence of consistency in a subject's interlanguage.

Chapter 2 presents a review of the literature; the procedure for the study is outlined in Chapter 3, with the results being presented in Chapter 4. A discussion of the results, considerations for further research and pedagogical implications are contained in Chapter 5.

CHAPTER 2

SECOND LANGUAGE ACQUISITION STUDIES

Second language acquisition studies have primarily focused on the errors made by subjects learning a second language in order to determine (1) invariant orders of acquisition for different structures and (2) the processes and strategies involved in acquiring a second languge. Chapter 2 examines and evaluates these two areas of second language acquisition research.

2.1. Invariant Orders of Acquisition

Numerous studies of second language acquisition have been based on first language acquisition research models. Two popular first language acquisition research models have been Brown's (1973) longitudinal study of three children (ages at the beginning of the study: eighteen, twenty-seven, and twenty-seven months) and deVillers and DeVilliers' (1973) cross-sectional investigation of twenty-one children (ages sixteen to forty months). Both of these studies focused on the acquisition of certain grammatical functors (eg., plural morpheme, past tense morpheme, etc.). In order to determine an order of acquisition, Brown notes the presence or absence of each functor in each "obligatory context" (ie., context in which a functor is required in adult syntax). A functor was considered acquired when it was supplied in ninety percent of the obligatory contexts for three successive recording sessions. In their cross-sectional study, the deVilliers used two methods to analyze their data: Method I involved a cross-sectional adaption of Brown's longitudinal method (ie., morphemes were ranked according to the lowest MLU, "mean length of utterance," sample at which each reached the ninety percent criterion) while method II consisted of ranking the functors according to the relative accuracy in obligatory contexts (ie., percentages supplied in obligatory contexts for each subject was averaged). In the Brown study a developmental sequence was found in the acquisition of the fourteen grammatical morphemes studied. That is, despite differing rates of first language acquisition, there was a surprisingly uniform developmental course that all children took in learning English grammatical morphemes. In the deVilliers' cross-sectional investigation, an ordering of morphemes was also found; moreover, the deVilliers'

ordering of morphemes correlated highly with Brown's ranking. Because of the high correlation found between Brown's longitudinal study and the deVilliers' cross-section study, it was assumed that cross-sectional studies would reflect the second language acquisition process just as accurately as longitudinal studies would.'

One of the first studies to use the cross-sectional procedure in second language acquisition research was that made by Dulay and Burt (1973). In their study of 145 Spanish-speaking children, ages five to eight, learning English, they administered the Bilingual Syntax Measure, an instrument devised to elicit natural spontaneous speech data. Upon analysis of the data, they claimed the existence of a "common order of acquisition" for the eight grammatical morphemes under investigation. The ordering found, however, differed from that of first language learners in the deVilliers' study. Dulay and Burt explain the inconsistency between the two orderings by contending that since their subjects were ages five through eight and thus were older than the subjects in the Brown and deVilliers studies, their cognitive and conceptual development was more sophisticated.

Dulay and Burt followed up their 1973 study with a similar study in 1974a. In this study, they compared the acquisitional sequences of eleven morphemes for fifty-five Chinese-speaking and sixty Spanish-speaking children. Three different methods of analysis were again used: Group Score, Group Means, and Syntax Acquisition Index. The Group Score method involves:

> . . . Computing a ratio whose denominator is the sum of all obligatory occasions (where each occasion is worth 2 points) for that morpheme across all children in the group, and the numerator is the sum of the scores for each obligatory occasion of that morpheme across all children, and multiplying the resultant quotient by 100. (p. 44)

Each response was assigned points as follows: no functor (eg., she's dance_)--zero points; misformed functor (eg., she's dances)-- one point; and correct functor (eg., she's dancing)--two points. The Group Means method also involves computing a ratio whose denominator is the sum of the scores for each obligatory occasion. This is done, however, for each child separately. Then mean functor scores are computed for the eleven functors. This is done in order to reduce the effect of variability; no scores were computed for children with fewer than three obligatory occasions. The Syntax Acquisition Index is an acquisition index borrowed from the Bilingual Syntax Measure scoring

system. It is a variation of deVilliers' Method I for ordering functors and the assumption behind it is that the child's utterance can be determined even if part of it is absent or misformed. Thus, according to the Syntax Acquisition Index, it is feasible to think of an overall syntax acquisition index in terms of "how much of the grammatical structure that the child offered in his/her utterance was well-formed." All three methods yielded approximately the same sequence of acquisition for both language groups.

Another cross-sectional study was made by Bailey, Madden and Krashen (1974). They also used the Bilingual Syntax Measure on seventy-three adult learners of English (ages seventeen to fifty-five) to investigate the usage of eight English functors and found that, despite the differences in the amount of instruction, exposure to English, and mother tongue, there was a highly consistent ordering in the use of these functors across different language backgrounds. Moreover, when their data on adult learners was compared with the Dulay and Burt data on children learning a second language, they found significant correlations, which they interpreted as meaning that children and adults learning a second language use common strategies and that they process linguistic data in fundamentally similar ways. These findings were supported by a similar study conducted by Krashen, Sferlazza, Feldman, and Fathman (1976) on sixty-six adult speakers of English as a second language who took the SLOPE test, a measure of oral production covering twenty structures in English. When compared with the SLOPE test results of 120 children (Fathman 1975), no significant difference was found between the children and the adults or among the various first language groups. As in the Dulay and Burt study, the rankings in the Bailey et al. study did not correlate significantly with the deVilliers' cross-sectional ordering for children learning English as a first language.

The question of whether second language acquisition is similar to first language acquisition has been investigated by several researchers. One such study was made by Cook (1973). In her study it was found that in imitation exercises of relative clauses, foreign adults made many of the same kinds of alternations as native children. Indeed, many of the mistakes typically designated as "foreign" were also made by children. The second part of the Cooks study dealt with sentences like "The duck is happy to bite." and "The duck is hard to bite." where duck is the subject of *happy* but the object of *hard*.

It was found that again there were similarities in the ways native children and foreign adults perceived these structures. Both groups started with a strategy whereby the surface structure subject was the subject of the deep structure (ie., *duck* was the subject of both *happy* and *hard*); both groups then entered a stage in which they interpreted the deep and surface structure on a hit-or-miss basis; and finally both groups entered a period of being fully aware of deep and surface structures. It shoud be noted that both of the studies conducted by Cook dealt with how people understand sentences and not how they learn them; it still needs to be proven that perceptual strategies are the same as the learning strategies of children. Yet since in these cases there was an absence of differences between the learning strategies and perceptual strategies at different stages of development, evidence is thus provided for the underlying similarity of the processes.

Cook cites two other studies on the comparison of first and second language learning. Palmero and Howe (1970) found that adults approached an experimental learning situation in the same way that children learn the past tense inflections in English. Stolz and Tiffany (1972) found that the characteristic differences between word associations of children and adults could be cancelled out by giving adults unfamiliar words. Here again, in these two studies differences between first and second language learning seem to disappear.

Some research studies have shown that there is a similarity between children learning English as a second language with children learning English as a first language. Milon (1974) found that the Japanese child's acquisition of English negation parallels the stages found by Klima and Bellugi (1966) for first language learners acquiring negation. In the Natalicio and Natalicio (1971) study, the acquisition order of plural allophones by native Spanish-speaking children learning English was the same as for children learning English as their native language. The developing English WH-question and negative structures of two Norwegian children were indistinguishable from those of children learning English as a first language (Ravem 1969, 1970).

Although the studies just cited above give the impression that for second language learners there is an invariant order of acquisition and that this ordering is the same regardless of language background (mother tongue, exposure to language, amount of instruction, etc.) and age (child learner versus adult learner), other studies have raised

doubts. For whereas a first language develops as the result of the cognitive development of the learner, it is unknown to what second language is related.

Schumann (1976) has demonstrated the importance of motivation and its interaction with social distance. In studying the untutored acquisition of English by a thirty-three-year-old Costa Rican over a ten-month span, Schumann found that there was very little increase in linguistic proficiency. He attributed this to social and psychological distance from speakers of the target language, based on the fact that the subject's speech showed evidence of pidginization. A pidgin language (ie., a simplified and reduced form of speech used for communication between people with different languages) is characterized by a lack of inflectional morphology and a tendency to eliminate grammatical transformations:

> . . . pidginization in second language acquisition can be viewed as initially resulting from cognitive constraints and then persisting due to social and psychological constraints. Hence, early second language acquisition would be characterized by the temporary use of a non-marked, simple code resembling a pidgin. This code would be the product of cognitive constraints engendered by the lack of knowledge of the target language. The code may reflect a regression to a set of universal primitive linguistic categories that were realized in early first language acquisition. Then, under conditions of social and/or psychological distance, this pidginized form of speech would persist. (p. 406)

Recently, several questions have been raised about the findings in some of the early second language acquisition studies. Although the cross-sectionally obtained acquisition rankings correlated with longitudinally-derived rankings in first language studies, Bailey et al. cautiously refer to their ordering as a "difficulty order of morphemes" instead of an "acquisition order of morphemes," as Dulay and Burt do. This issue of whether cross-sectionally obtained data reflects acquisitional orders has been investigated by Rosansky (1976). As part of her study, Rosansky tried to determine the correlation between cross-sectionally derived rank order of morpheme accuracy and a longitudinally derived order of acquisition. She found that the cross-sectionally derived order and the longitudinally derived order for the same individual did not correlate. Moreover, the rank order of morphemes fluctuated from month to month. Rosansky's study thus questions the validity of using cross-sectionally derived orders to determine the acquisitional order and thus raises serious

doubts about the methodological procedures currently being used in second language acquisition research.

Larsen (1975) suggests that perhaps an even more appropriate description of these rank orderings is an "accuracy order for the specific task." Larsen used the Bilingual Syntax Measure and four other measures (reading, writing, listening, and imitating) in a cross-sectional study of the ESL morpheme acquisition of twenty-four adults (six Arabic, six Japanese, six Persian, and six Spanish speakers). Larsen found that in four of the five tasks--the reading task was the exception--concordance was high among language groups. In other words, performance in morpheme ordering did not seem to be radically affected by language background. However, even though there was concordance among the language groups for the four tasks, Spearman rank correlation coefficients between two language groups often were not significant within each task, with the exception of the Bilingual Syntax Measure where each of six possible pairings of language groups were significant at the .01 level. Since the Bilingual Syntax Measure had produced higher Spearman rank correlation coefficients than the other tasks, an analysis was done to determine whether or not the Bilingual Syntax Measure was a more reliable measure of morpheme ordering than the other four tasks. With the exception of the reading task, the reliabilities of the measures for determining differences among morpheme difficulties were comparable. When the ordering on one task was compared with the ordering on another, few statistically significant correlations were found.

These findings bring up the question of whether the medium influences the results. When the Bilingual Syntax Measure ordering was compared with the Dulay and Burt (1974a) ordering, there was a significant correlation; only one other task, an imitation task, correlated with Dulay and Burt's order. Larson concludes by stating that until Bilingual Syntax Measure-generated orders are cross-validated with sequences obtained using other instruments, it is questionable whether general acquisition orders are being obtained.

This question was also investigated by Porter (1977), who used the Bilingual Syntax Measure to elicit speech samples from eleven first language learners (aged twenty-seven to forty-eight months). He used three different methods to analyze his speech samples and although there was a correlation among the three methods, there was no correlation between these methods and two previously determined

orders of first and second language acquisition (Dulay and Burt 1973; deVilliers and deVilliers 1973). Like Larsen, Porter contends that the type of speech elicitation technique may influence the responsens given.

Rosansky (1976) also addresses herself to the issue of the influence of the elicitation technique. In another part of her study, she tried to determine if "the morpheme order obtained using an elicitation instrument (Bilingual Syntax Measure) resembled the order of morphemes obtained from spontaneously collected second language acquisition data." Rosansky examined a one-hour taped session for each of her six subjects (untutored Spanish speakers learning English: two children, two adolescents, and two adults). Her hypothesis was that the rank order of morphemes derived from her spontaneous speech data would not correlate with Dulay and Burt's Bilingual Syntax Measure-generated order. Her correlations, however, not only correlated with Dulay and Burt's, Bailey's et al., and Larsen's Bilingual Syntax Measure orders, but with the deVilliers' first language order as well.

In trying to explain the contradiction in these correlations, Rosansky reexamined her data and found a great deal of variation among the subjects. She found that the various statistical treatments applied to the data obscured this information. She observed that when she compared the individual subjects' ranks for morphemes, they did not correlate significantly. Nor did the individual orders of subjects paired by age correlate. With such large variance among subjects, Rosansky questions whether the language performance of the population is accurately being described.

Variation among subjects was also found in the speech samples collected by Bertkua (1974) from fifteen adult native Spanish speakers and fifteen adult native Japanese speakers. With the intention of investigating the stability and coherence of the learners' speech, she analyzed the language samples to find regularity in the appearance of "variants," defined as recurring patterns of production. In examining the frequency of variants of each language group as a whole, she found considerable variation in the frequency of variants among subjects. Although no variant appeared in the data of all subjects in either group, she was able to distinguish certain variants which were representative of each group. She next examined the frequency of variants present in the data of individual learners. Each subject produced certain cominations of variants. Although some individuals produced a particular variant consistently, in most cases subjects

were inconsistent in their use of variants.

This question of whether or not the order of difficulty is related to the type of elicitation device used has been investigated by Krashen, Houck, Giunchi, Bode, Birnbaum, and Strei (1976). They found that the grammatical morpheme difficulty order in adult free (unmonitored) speech correlated with the order obtained using the Bilingual Syntax Measure for both children and adults. They obtained a similar order of difficulty after analyzing compositions. With regard to the amount of variation among subjects, Krashen (1977) reviewed studies in which grammatical morphemes were analyzed in obligatory occasions; he included only those morphemes with at least ten obligatory occasions in a given study. Although he expected variation, he found an amazing amount of uniformity across all studies that used monitor-free instruments. He attributes the discrepancy between this and Rosansky's findings to the fact that Rosansky allowed items to be analyzed that appeared in less than ten obligatory occasions for an individual.

2.2. Second Language Acquisition Processes and Systems

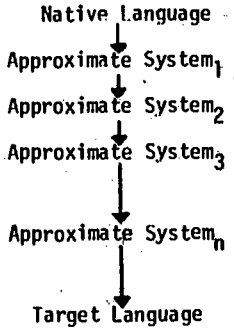
In the previous section we saw how some second language studies have focused on establishing a sequential order of acquisition. Other researchers have focused on the processes involved in the acquisition of a second language and on positing a theory about the second language learner's language system. This section will focus first on the attempts to catogorize the different errors mady by second language learners in hopes of discovering the processes underlying second language acquisition and then will discuss the concept of "interlanguage".

2.2.1. Error Analysis

According to Cooper (1970), language learning involves the abstraction of the linguistic rules underlying a language as well as the sociolinguistic rules underlying its use. This is true for all language learning, regardless of whether it is a first language or a second language. Yet although all language learning involves internalizing linguistic rules, it is an open question as to how this process is accomplished.

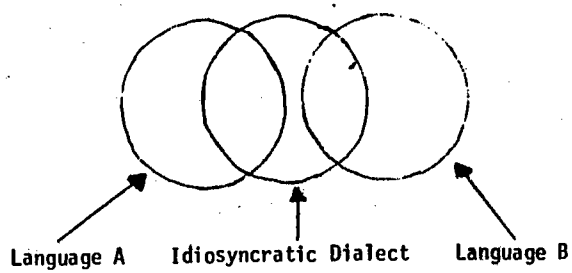
Nemser (1971) posits that the acquisition of a second language involves systematic stages with an approximate system at each stage. These approximate systems at each stage of proficiency are distinct from both the native language and the target language; "approximate" refers to approximating the target language system. The approximate

systems are linguistic systems which are internally structured and form "an evolving series." Fundamental to this viewpoint is the idea that the speech a learner uses at a given time is a structured and cohesive system.



Approximate systems vary in character according to proficiency level, learning experience, communication function, personal learning characteristics, etc.

Corresponding to Nemser's "approximate systems" is Corder's (1971) "idiosyncratic dialect." Like Nemser's concept, an idiosyncratic dialect is though to be transitional and is usually represented as such:



This diagram represents a "dialect" whose rules share characteristics of two languages but which has some of its own (ie., some of the rules are particular to the individual). Idiosyncratic dialects are, by nature, unstable and there are different "classes" of idiosyncratic dialects. The language of the second language learner is not the only kind of idiosyncratic dialect. One class is the language of poems where parts can be deliberately deviant; another is the speech of an aphasic,

which Corder categorizes as pathologically deviant. A third class of idiosyncratic dialect is the language of an infant learning his first language. An alternative name for idiosyncratic dialect is transitional dialect, a term which emphasizes the instability in such dialects.

A direct examination of these approximate systems or idiosyncratic dialects (and, in turn, of the acquisition process) can be made by examining the types of errors made by language learners (Corder 1967):

> It is in such an investigation that the study of learner's errors (in second language learning) would assume the role it already plays in the study of child (first) language acquisition, since the key concept . . . is that the learner is using a definite system of language at every point in his development, although it is not the adult system in the one case, nor that of the second language in the other. The learner's errors are evidence of this system and are themselves systematic. (p. 166)

In other words, errors should not be viewed as problems to be overcome but instead as normal and inevitable features indicating strategies the learners are using. From these systematic errors of the learner we are able to reconstruct his "transitional competence" and the processes involved in second language acquisition.

The study of the errors made by second language learners has been termed "error analysis." Unlike contrastive analysis, which concerns itself only with comparing the structure of different languages in order to predict native language interference, error analysis (EA) investigates other sources of error. Duskova (1969), putting to test Corder's hypothesis that a student's errors are reflective of the student's "transitional competence" and not just to native language interference, studied the errors that Czech learners of English made in written compositions. She did find some errors that could be traced to the students' native language but believed that:

> . . . the actual source of most errors. . . is . . . interference from other terms of the English system and only rarely from the corresponding Czech form. (pp. 23-24)

For example, the English present and past participle verb forms were often confused by the Czech learners although the English is analogous to the corresponding Czech form:

> the rules should not be considered
> pravidle by nemela byt povazovana

If the learner translated the Czech verbal system word for word into English, he would not make a mistake. In addition, Duskova found up to twenty-five percent of the errors to be unique to the individuals involved.

Richards (1971), in his study on the acquisition of English by French and Czech speakers, agreed with Duskova's findings that most errors were not due to native language interference and also identified several other error categories, including overgeneralization and the strategies of communication and assimilation. According to Jakobvits (1970), overgeneralization is defined as:

> . . . the use of previously available strategies in new situations. In second language learning, some of these strategies will prove helpful in organizing the facts about the second language, but others, perhaps due to superficial similarities, will be misleading and inapplicable. (pp. 111-112)

An example of overgeneralization is the phrase "this is occurs," which is generalized from forms "it is made of" and "it occurs." The communication strategy refers to the use of alternative forms to express content for which the speaker did not have the grammatical means to express. For example, instead of saying "J'aurais voulu voir le film hier soir' (I would have liked to have seen the film last night), the speaker says "J'avais l'intention de voir le film hier soir, mais . . ." (I had the intention of seeing the film last night, but . . .). Communication strategies refer to a learner forced to communicate at a level above his competence. The inappropriate use of "je vais" for the future in French (eg., "Je vais telephoner ce soir" for "Je vous telephonerai ce soir") is the result of the assimilation strategy. The learner, in taking from the language what he needs in order to communicate, often simplifies the language he is learning in order to make it more easily assimilated. The learner attempts to reduce the learning burden when using this strategy of assimilation. Pidgin languages are the result of the strategies of assimilation and communication. Richards also found a set of errors due to the various styles found in a language. Because of registers and conventions, learners often make stilted or unnative-like utterances.

In another article, Richards (1973) again looks at errors made by foreign adults learning English and posits two types of error categories: intralingual and developmental. Excluded from his

discussion were interference errors caused by the interference of the learner's mother tongue. Intralingual errors are those which reflect the general characteristics of rule learning, such as faulty generalization, incomplete application of rules, and failure to learn conditions under which rules apply. Faulty generalizations (ie., overgeneralization) involves, as stated above, the learner creating deviant structures on the basis of his experience with other structures in the target language (eg., "he can sings" where with "can" the concord ∂ is not needed). An example of ignorance of a rule restriction is "I made him to do it" where the restriction on the use of "to" with "make" has been ignored. The category of incomplete application of rules refers to cases such as a student's response of "Yes, I cook very much." to the teacher's question of "Do you cook very much?". As Richards comments, this category includes structures whose deviancy represents the degree of development of the rules required to produce acceptable utterances. Developmental errors illustrate the learner's attempt to build up hypotheses about the target language. An example of false concepts being hypothesized is the form "was" being interpreted as a marker of the past tense (eg., "one day it was happened").

Dulay and Burt (1972) classified child second language errors according to first language acquisition research. As proponents of the L1 = L2 theory, which predicts that L2 acquisitional errors will be similar to L1 acquisitional errors and are not the result of negative transfer (ie., interference), they contend:

1. Children below the age of puberty will make goofs in L2 syntax that are similar to L1 developmental goofs (eg., omission of functors).

2. Children below the age of puberty will not make goofs that reflect transfer of the structure of their L1 onto the L2 they are learning (eg., no use of native language word order when reverse in target language).

Based on these two points, they set up the following categories:

1. Interference-like Goofs: those goofs that reflect the learner's L1 structure and are not found in L1 acquisition data of his target language.

They give as example "her pajamas" (possessive pronoun number agreement is not allowed in English but is obligatory in Spanish), produced by

a Spanish child and reflecting Spanish structure but not reported in L1 studies in English

2. L1 Developmental Goofs: those goofs that do not reflect the learner's L1 structure but are found in L1 acquisition data of his target language.

An example is "he took her teeths off" (irregular plural treated as regular), which does not reflect Spanish structure although produced by a Spanish child but is an overgeneralization typically produced by children acquiring English as their first language.

3. Ambiguous Goofs: those goofs that can be categorized as either Interference-like Goofs or L1 Developmental Goofs.

Such an ambiguous goof is "he no wanna go" (wrong placement of "no"; "no"/"not" distinction; "do" missing--all errors being similar to L1 English acquisition in Klima and Bellugi (1966) Stage 2 but also obligatory in Spanish), which reflects both Spanish structure and is typical of American children learning English as their native language.

4. Unique Goofs: those goofs that do not reflect L1 structure and are also not found in L1 acquisition data of the target language.

For example, "he name is Victor" (use of nominative "he" for possessive pronoun "his") is not due to interference with Spanish nor is it found in L1 acquisition data in English.

2.2.2 Interlanguage

Based on the analysis of the different types of errors made by second language learners and closely related to Nemser's notion of "approximate systems" and Corder's "idiosyncratic dialect" is Selinker's (1972) notion of "interlanguage," which is defined as "a separate linguistic or psycholinguistic system" which draws on both the native language and target language, as well as other sources, for its surface forms. Such a concept was based on the following observations (Tarone, Frauenfelder, and Selinker 1976):

1. Whenever a learner attempts to express meaning in a second language, the utterances which he or she produces will not be identical with those which would have been produced by the native speaker of the target language (TL) (in attempting to express the same meaning).

2. Furhermore, some utterances (and some portions of utterances) of this deviant type may remain (fossilized) in learner speech and writing over time.

3. Learner-produced L2 utterances will not be an exact translation from the native language (NL) but will be formed by a variety of learning and production strategies, language transfer (both positive and negative) clearly being a major strategy. (pp. 95-96)

Unlike Nemser's and Corder's concepts, however, the stages in "interlanguage" are neither "directional" (evolving closer and closer to the norm) nor "discrete."

Selinker attributes the occurrence of interlanguage to the "latent psychological structure" which is activated when one attempts to learn a second language. This parallels Lenneberg's (1967) "latent language structure." Both structures are already-formulated arragenments in the brain; but whereas Lenneberg's is a counterpart to universal grammar and is transformed by the language learner into the realized structure of a particular grammar in accordance with certain maturational stages, Selinker's latent psychological structure has no genetic timetable, has no direct counterpart to a grammatical concept such as "universal grammar," and gives no guarantee that it will be realized into the actual structure of any natural language. Furthermore, this structure probably overlaps with other intellectual structures.

In the latent psychological strucutre, there are five processes which Selinker considers to be central to second language learning. These processes are (1) language transfer, (2) transfer of training, (3) strategies of second language learning, (4) strategies of second language communication, and (5) overgeneralization of target language linguistic material. Like the reasons put forth by Richards (1971a, 1971b) and Dulay and Burt (1972), these processes account for the errors found in the speech of second language learners.

Language transfer equates with the earlier discussed native language interference. Transfer of training refers to errors as the result of identifiable items in training procedures. For example, Serbo-Croatian speakers do not distinguish between "he" and "she" in English even though they have this distinction in their own language. According to Selinker, this phenomenon is attributale to the practice of textbooks and teachers always presenting drills with "he" and never with "she." One example of a strategy of second

language learning is the tendency to reduce the target language to a simpler system (cf. Richards, 1971b), as Jain (1969) found with Indian speakers of English who adopted the strategy that all verbs can be either transitive or intransitive and produced forms such as "I am feeling thirsty" and "I'm hearing him." An example of a strategy of second language communication (cf. Richard 1971b) is cited by Coulter (1968) who found a tendency by Russian speakers of English to avoid grammatical formatives such as articles (eg., "It was Ø nice, nice trailer, Ø big one"), plural forms (eg., "I have many hundred carpenterØ of my own"), and past tense forms (eg., "I was in Frankfurt when I fillØ application"). Coulter contends that such a strategy dictates to the speaker to omit such forms since they only make his speech hesitant and disconnected to the native speaker. Overgeneralization of target language materials is exemplified in sentences such as "What did he intended to say?" where the past tense morpheme has been extended to an environment in which to the learner it would seem to logically apply (eg., "intent").

There are many other processes involved in language learning besides these five: spelling pronunciations (ie., pronunciation of final *-er* on English words as (ɛ) plus some form of ɹ; cognate pronunciation (ie., pronunciation of "athlete" by native French speakers regardless of whether of not they can produce θ in other English vowels); holophrase learning (ie., production of "one-and-half-an-hour" for "half-an-hour"); hypercorrection (ie., production of [w] front vowels in place of uvular fricative for English retroflex [r˞).

These five central processes result in fossilizations in the interlanguage of a second language learner. Fossilized items are

> . . . linguistic items, rules, and subsystems which speakers of a particular NL will tend to keep in their IL relative to a particular TL, no matter what the age of the learner or amount of explanation and instruction he receives in the TL (p. 215)

Fossilizations include "errors" such as the German time-place order after the verb in the English interlanguage of German speakers and also so-called "non-errors" such as Hebrew object-time surface order after the verb in the interlanguage of Hebrew speakers speaking English. Selinker emphasizes the fact that these fossilized items

usually remain as "potential performance," appearing in the interlanguage when thought eradicated. These can appear when the learner is dealing with difficult subject matter, when in a state of anxiety or excitement, and even when in a state of relaxation. Selinker goes on to claim that any "backsliding" that occurs will not be random nor will it be toward the learner's native language but instead it will be toward the interlanguage norm.

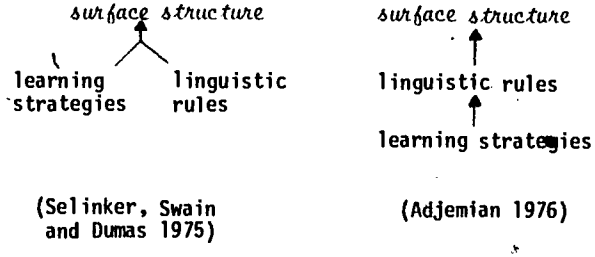
If interlanguages are assumed to be natural languaes with a system of rules, as assumed above, then they are subject to the general constraints on form that is placed on other natural languages. For example, one of the constraints on natural languages is that against backward pronominalization. For example, the sentence "He_1 told me that $John_1$ would come." would not occur in the interlanguage of a language learner. An investigation into the constraints and properties of interlanguage has been done by Selinker, Swain, and Dumas (1975). They propose four properties characteristic of interlanguages: mutual intelligibility, systematicity, stability, and backsliding.

Like other natural languages, interlanguages must be intelligible, for the function of language is communication. Needless to say, intelligibility is not a characteristic that differentiates interlanguages from other natural languages. Selinker, Swain, and Dumas define the second characteristic of interlanguages--systematicity-- by stating:

> . . . we do not mean features of speech which are predictable by grammatical rule on a given occasion. No linguistic theory can do that, even when the complications of bilingualism are not brought in. . . since second language speech is after all in the process of developing, systematicity here may mean that such speech evidences recognizable strategies. (p. 141)

The strategies mentioned include three of the central processes existing in the latent psychological structure: language transfer, overgeneralization of target language rules, and the strategy of second language learning. Adjemian (1976), in his discussion of the interlanguage hypothesis, interprets this definition as meaning that, unlike "normal" speech, interlanguage is the product of learning strategies and linguistic rules. These learning strategies "intersect with" linguistic rules in deriving a surface form from an underlying source. Learning strategies have little, if any, role in deriving a speaker's native language speech. Thus, the use of learning strategies is a unique property of interlanguages. Adjemian, on the other hand, posits that learning strategies and linguistic rules do not intersect but that

learning strategies only help the learner form his linguistic rules. Only the linguistic rules are concerned in the actual form of a linguistic system. These two approaches can be illustrated as such:



(Selinker, Swain and Dumas 1975)

(Adjemian 1976)

In the Selinker, Swain, and Dumas analysis, it is difficult, if not impossible, to distinguish between these two cognitive processes (ie., linguistic rules and learning strategies) on the basis of data. As Adjemian (1976: 303) points out:

> Now, if it were true, as SS&D (ie., Selinker, Swain, and Dumas) imply, that learner speech is derived by both linguistic rules and learning strategies; and if it is true that we cannot have an *a priori* notion of either the specific rules or strategies involved; then given a body of data, we cannot determine the nature of either for we are dealing with two unknowns.

A consequence of this statement is that the notion "learning strategy" becomes vacuous. Learning strategies cannot be defined only by what the linguistic rules have not produced.

The difference between Adjemian's approach to learning strategies and that of Selinker, Swain, and Dumas can be seen in their respective explanations of the following utterances made by a child:

(a) Il veut moi de dire francais a il.

The correct sentence would be

(b) Elle veut que je lui parle francais.

which translates as

(c) She wants me to speak French to her.

Although there are several errors here (eg., the antecedent for the subject pronoun and the indirect object was the child's mother, requiring use of the feminine form instead of the masculine form actually used), Selinker, Swain and Dumas focus on the claim that the learner has misapplied the rule of Subject Raising to Object Position. In other words, does not undergo this rule in French.

They credit this to "language transfer occurring in the syntactic derivation of the sentence," for "vouloir" takes a sentential complement (a "que"-clause) when the subject of the main clause differs from that in the embedded clause. Nor can the subject of the embedded clause come before the complementizer "que." In order to justify the claim that such a misapplication of the Subject Raising rule has applied, it needs to be shown that the learner uses a complement form like that in (1) with verbs that do require Raising: "Il me demande de parler francais," "Il me commande de parler francais," etc. It also needs to be shown that the learner has "generalized this 'raised' complement structure beyond 'vouloir.'" In other words, does the learner apply this rule of Subject Raising to other verbs which also only allow a sentential complement (eg., "Il espere moi de parler francais," which translates as "He hopes me to speak French"). It must be shown that sentence (1) is no "fluke."

Adjemian goes on to suggest that perhaps sentence (1) is not the result of a misapplication of a rule but an incorrect subcategorization of a verb. In other words, the learner has subcategorized the verb "vouloir" as requiring a *de + infinitive* complement. One proof of this would be the use of a *de + infinitive* complement with every occurrence of "vouloir."

Both explanations of sentence (1) make different claims about interlanguage. Selinker, Swain, and Dumas credit the error to the transfer of a rule of English into the learner's interlanguage; Adjemian claims that it is the result of a linguistic rule, which, in this case, is a rule of subcategorization. Adjemian's analysis claims that there is a regularity in the interlanguage. Thus Adjemian's proposal lends a certain amount of internal consistency to the interlanguage, which results in the production of particular structures on a more or less regulas basis. Adjemian (1976: 301-2) suggests that the notion of systematicity be defined differently and suggests that systematicity be

> . . . taken to mean that there exists an internal consistency in the rule and feature system which makes up the IL. Like all human languages, IL must contain an organized set of rules and basic elements (lexical items, phonological units, grammatical categories, etc.). The organization of these sets into a coherent functional whole results in the emergence of a linguistic entity with internal consistency: systematicity. Thus, this property may not be used to differentiate ILs from other language systems.

Another salient characteristic of ILs is that they are linguistic systems which by nature are in a state of flux in conveying meaning. For in the need to communicate, a learner whose target language rules are not yet formed produces a string which is neither consistent with nor possible for the norm. The production of an inconsistent string is the result of one of two processes: (1) the interlanguage system is penetrated by native language rules or (2) an internalized target language rule is incorrectly generalized. In both instances, there is a penetration of the interlanguage--either the penetration of rules foreign to the interlanguage systematicity or the distortion of an interlanguage rule. Adjemian refers to this property of interlanguage which allows penetration as permeability. These two processes are essentially transfer and overgeneralization. Adjemian emphasizes the notion that interlanguages are peremeable and that it is not the "application" of transfer or overgeneralization that results in incorrect speech forms but that these two processes in turn cause linguistic rules to apply where they normally would not in the same way. Again, he contends that learning strategies do not directly form the speech but do so indirectly by creating hypotheses as to the grammatical possibilities of the linguistic system being learned. Such permeability would not be allowed in a learner's native language, for it is consistent and relatively stable.

Adjemian represents these two processes of penetration in Figures (1) through (2).

In Figure (1) the box represents the internal systematic components of the interlanguage which produces a string with the semantic meaning *M*. The system cannot, however, produce a string for the meaning *N* because of the lack of the necessary rules, features, or items. The speaker then has two options: the interlanguage is penetrated by rules from the native language (as in Figure 2a) or the rule or form of the interlanguage is distorted or overgeneralized (as in Figure 2b). Selinker, Swain, and Dumas's position that learning strategies "intersect with" linguistic rules is represented in Figure (2b). With Adjemian, only linguistic ru es are utilized in the procution of speech forms; Selinker, Swain, and Dumas's position that learning strategies "intersect with" linguistic rules is represented in Figure (3). With Adjemian, only linguistic rules are utilized in the production of speech forms; with Selinker, Swain, and Dumas, both learning strategies and linguistic rules are used

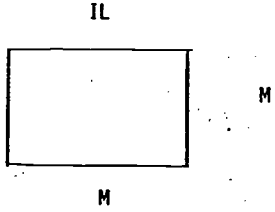


Fig. 1. IL Production of Semantic Meaning

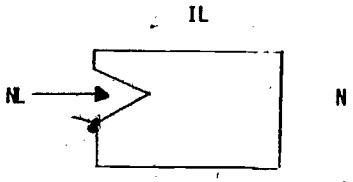


Fig. 2a. NL Transfer

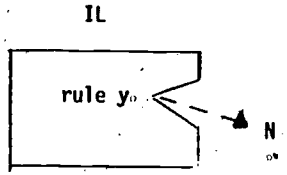


Fig. 2b. Overgeneralization or Other Modification of IL Rule

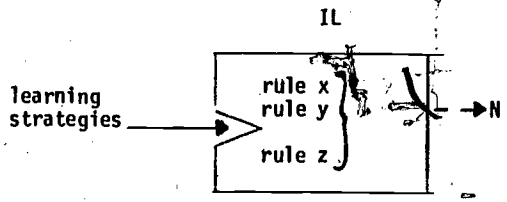


Fig. 3. Learning Strategies Intersecting with Linguistic Rules

directly to produce meaning N. Adjemian claims that only interlanguages can display the behavior represented in Figures (2a) and (2b); other natural languages can only be represented as Figure (1). Thus, Adjemian maintains that permeability is a property unique to interlanguages and thus differentiates them from other natural languages.

The third property of interlanguages--instability--is defined by Selinker, Swain, and Dumas (1975:150) as:

> . . . when more than one strategy intersects in second language acquisition, there will be more "power" or stability in the resultant IL.

Stability here refers to the occurrence of certain forms over time, with two types of stabilities possible: stability over time in the production of correct forms and stability over time in the production of incorrect forms; such a distinction is useful in showing a progression toward the target language norm. Adjemian argues that stability should not be defined in terms of errors or of correct forms but in terms of overall systematicity. In other words, stability should refer only to those aspects of the interlanguage which have lost their permeability. Although stability may result in the production of "correct" or "incorrect" forms, in Adjemian's view these forms are always correct if they are stable (ie., occur systematically). Thus, stable items include a target language item incorrectly generalized or modified, a native language item borrowed into the interlanguage, or a target language item correctly used in the interlanguage. In all three cases, particular linguistic elements are used consistently by the learner to produce speech forms. Adjemian proposes that stability in an interlanguage is equivalent to the interlanguage norm.

Stability is evidenced by fossilized items in the interlanguage. The regular reappearance of fossilized errors that were thought to have been eradicated has been termed "backsliding." Susceptible to backsliding are those learners who do not freeze their interlanguage at a plateau but continue toward the target language. Selinker (1972) notes that backsliding refers to sliding back not to the native language but to the interlanguage norm. Implied is the distinction between fossilization and backsliding. The utilization of fossilized forms involves no alternative form or rule in a learner's competence. Backsliding, on the other hand, involves the learner having two forms at his disposal and, under certain circumstances such as anger, not using the form appropriate to the situation.

Moreover, backsliding is evidence of a function in an interlanguage which has almost lost its permeability. And permeability resulting from the absence of stability is, according to Adjemian, the main difference between interlanguages and other natural language systems.

In summary, then, according to the interlanguage hypothesis, the learner's knowledge is a separate linguistic system, being identical to neither target language nor to the native language and having the following characteristics: mutual intelligibility, systematicity, stability, and backsliding. Systematicity, as shown above, refers to the internal consistent use of rules; stability refers to the consistent use of these rules over time. Use of a fossilized term thought eradicated is termed backsliding. But the interlanguage that this view of interlanguage as a separate system implies that the interlanguage speaker never actually speaks the target language. For when a native speaker of Finnish, for example, speaks English, he is speaking English, regardless of the number of errors due to the interference of Finnish or other sources.

Moreover, the interlanguage hypothesis cannot account for variability. Tarone et al. (1976: 94) comment on this fact with regard to the example of a French child producing within a two-minute segment on tape three variations in French for "I like"--"J'ai aime," "J'aime" (correct form), and "Je aime." They ask:

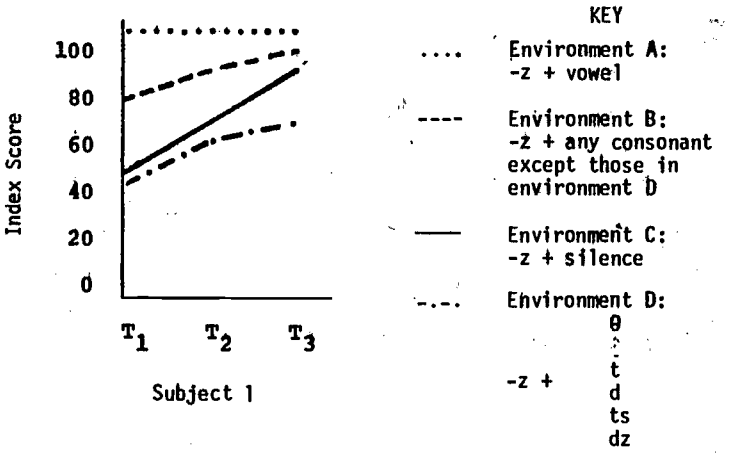
> How are we to account for such variability? And is it possible to maintain the notion "system" so central to the IL hypothesis given such variability? At present there appear to be no easy answers to these questions.

The importance of the concept of variation in the study of language is relatively new for language, which has traditionally been viewed as categorical. By this it is meant that language is conceived as a set of discrete, qualitatively distinct, invariant categories. Variation was considered to be the result of "performance" errors and irrelevant to linguistic theory. According to Chomsky, the objective of linguistic study was to be an ideal construction of a homogeneous speech community in which all speakers learned the language perfectly and instantly.

That language does not consist of a set of discrete invariant categories but of variables which are present in percentages has been shown by Labov (1969). Labov posited the use of variable rules to reflect variation in language; these rules state the percentage

of occurrence for a variant in a particular environment. The notion of variation and of variable rules has been used in sociolinguistic research with insightful results. More recently, it has been applied to first language acquisition research studies (Labov and Labov 1976).

The use of variable rules has been applied to second language acquisition research by Dickerson (1975) in her longitudinal study of the acquisition of the English sound sytems by ten Japanese speakers. Dickerson found that the production of a sound was influenced by the phonetic environment (a fact that has been shown to be true in native language studies). Over time there was a change in the proportion of variants used in the different environments. Bar graphs for all subjects for different sounds in different environments looked similar to the one shown below for Subject 1 for the production of /z/ in a dialogue reading; the ordering of environments found at T_1 (ie., Time 1) was maintained through T_2 and T_3.



For each environment, each instance of a variant is multiplied by its index value:

Variant	*Index Score*
ø	0
s	1
dz	2
t	3
z	4

The index scores consist of assigning progressively greater values to the variants to represent the extent to which an individual had progressed toward the [z] . These products are added and divided by all the instances of (z) had they been (z) (ie., four x total number of instances). The quotient is multiplied by 100.

The notion of variable rules has also been used in L2 research on syntax. Hyltenstam (1977) investigated the acquisition of Swedish negation by adult second language learners and his findings suggest that the process of acquisition of negation is a continuous transition from one state to another. Hyltenstam found the acquisition of the placement of the negative to be fairly regular for his 160 subjects of different language backrounds.

In Swedish, the negative is placed after the finite verb in main clauses but immediately before the finite verb in subordinate clauses:

Negative in Main Clause

(1) Kalle kommer inte idag.
Charlie comes not today.

Negative in Subordinate Clause

(2) Det är skönt att Kalle inte kommer idag.
It's fine that Charlie not comes today.

Assuming that the early stages of interlanguage here are strongly characterized by the simplification strategy, Hyltenstam hypothesized that the point of departure for all learners was

$$X - Neg - V^{finite} - Y$$

Using implicational scales, Hyltenstam found the following route of sequence:

Main Clause		*Subordinate Clause*	
Auxiliary Verb	*Main Verb*	*Main Verb*	*Auxiliary Verb*
+	-	-	-
+	+	-	-
+	+	+	-
+	+	+	+

Thus, the order of acquisition of negation in Swedish is first the use of the negative with auxiliary verbs in main clauses followed by the use of the negative with main verbs in main clauses. Then comes the use of the negative with auxiliary verbs in subordinate clauses; last

is the use of the negative with main verbs in subordinate clauses. It is interesting to note that for main clauses, sentences with auxiliaries were easier than sentences with main verbs. With subordinate clauses, however, the sentences with main verbs were easier than sentences with auxiliaries.

Thus, instead of viewing interlanguage as a "separate system," an alternative proposal by Dickerson and Hyltenstam is that interlanguage should be thought of as a linguistic continuum. Learners do not proceed through a succession of well-defined and coherent systems but move along a continuum from the native language to the target language. Language acquisition is thus viewed as a process in which there is constant restructuring. As Corder (1976) points out, the notion of a linguistic continuum can be used to redefine interlanguage in order to show its dynamic aspects.

The notion of a linguistic continuum is not new in linguistic research. It has been applied by several linguists in their studies of two specific types of language process--pidginization and creolization (DeCamp 1971; Bickdrton 1975, 1977). A pidgin is a simplified form of a language for communication among people of different languages; a creole is a pidgin that has become the first language of a group of speakers. Bickerton (1975) shows that the decreolization of the Guyanese negation system can be represented as a series of developmental stages. He describes decreolization as a process in which more and more features of the standard language are incorporated into the creole. Each stage in the process (called "lects") make up a post-creole continuum, which can be represented as (Stauble, 1978):

Guyanese Creole ——— "Model" English

Basilect · Lower Mesolect · Mid Mesolect · Upper Mesolect · Acrolect

The similarity between pidginization/creolization and second language acquisition has been discussed by Schumann (1974, 1976, 1978) and Andersen (1980, 1981). They view not only pidginization/creolization but also second language acquisition as moving along a continuum. Schumann equates pidginization with early second language acquisition and decreolization with later second language acquisition. His justification for doing so is that both pidginization and early second language acquisition involve simplification and reduction while decreolization and later second language acquisition both involve

complication and expansion towards the "model" language. Andersen differs slightly from Schumann in that he equates early second language acquisition with both pidginization and creolization and later second language acquisition with both depidginization and decreolization. He attempts to account for the similarity between the processes. Pidginization/creolization and early second language acquisition represent "acquisition towards an internal norm": the learner is developing his own internal representation of the developing linguistic system (ie., his interlanguage). Depidginization/decreolization and later second language acquisition are characterized as "acquisition towards an external norm," ie., successful acquisition towards the target language.

Further support for the application of the notion of a linguistic continuum in second language acquisition research is given by Stauble (1978). She found that the acquisition of English negation by two native Spanish speakers proceeded through stages and that each stage was closer than its antecedent to the "model" language. Such findings confirm the analogy between decreolization and second language acquisition.

CHAPTER 3

RESEARCH

In this section, the research undertaken will be described, including the purpose for undertaking the research, an analysis of English and Finnish sentential complementation, findings of other studies on complementation, and the research design (ie., subjects, test, and data analysis).

3.1. The Purpose of the Present Study

From the discussion in Chapter 2 we can see that second language acquisition research studies have focused on errors made by learners of a second language in order to determine hierarchies for the order of acquisition and to determine the processes and strategies involved in order to set up a theoretical model. In reviewing the literature on second language acquisition research it is apparent that these two areas of research include several different issues.

With regard to the studies on establishing hierarchies of difficulty, the key issues are:

1. Is there an invariant ordering of acquisition for language structures? (cf. Dulay and Burt 1973, 1974; Bailey, Madden and Krashen 1974)

2. What influences does the type of task have on the ordering derived? (cf. Larsen 1975; Porter 1977; Krashen, Houck, Giunchi, Bode, Birnbaum, and Strei 1976)

3. Do language groups differ in their orderings for a structure? (cf. Krashen, Sterlazza, Feldman, and Fathman 1976; Larsen 1975)

4. Do cross-sectionally derived rankings differ from longitudinally derived orders? (cf. Rosansky, 1976)

5. Are the longitudinal orderings compiled for the group representative of the individual (cf. Rosansky 1976; Bertkua 1974; Krashen, Houck, Giunchi, Bode, Birnbaum, and Srei 1976)

6. Is second language learning similar to first language learning? (cf. Cook 1973; Milon 1974; Ravem 1969, 1970; Natalicio and Natalicio 1971)

7. Is child second language learning similar to adult second language learning? (cf. Palmero and Howe 1970; Stolz and Tiffany 1972)

With regard to the nature of interlanguage, it has been suggested that a learner's interlanguage be thought of as a continuum rather than a "separate linguistic system" (cf. Dickerson 1975; Hyltenstam 1977). A motivation for the continuum viewpoint is the necessity to account for variation.

The research undertaken here was an investigation into the acquisition of English sentential complementation by adult speakers of Finnish in an EFL environment. In examining the acquisition of English sentential complementation by Finnish speakers, the study will deal with several of the issues mentioned above:

1. What is the hierarchy of difficulty for the acquisition of English sentential complementation by adult speakers of Finnish?
2. How does the invariant ordering for the adult Finnish speakers compare with other language groups learning English sentential complementation?
3. Do the individual longitudinal orderings correspond with the cross-sectional hierarchy of difficulty?
4. For each subject do the orderings change significantly from one time to the next?
5. What is the degree of diversity from one subject to another with regard to the longitudinal orderings?
6. Can the acquisition process of complementation be seen as a continuum over time?

It is hypothesized that the invariant ordering compiled for the Finnish subjects for complementation will be similar to that derived for other language groups, as found in similar studies dealing with different language groups (ie., Dulay and Burt 1974; Bailey et al. 1974; Krashen et al. 1976). However, it is hypothesized the the ordering derived from the cross-sectional data will not reflect individual orderings, based upon the findings of Rosansky (1976). Moreover, it is hypothesized that there will be a great deal of variation among the subjects with regard to the orderings (cf. Rosansky 1976; Bertkua 1974). Finally, it is hypothesized that the process of complementation can be seen as a continuum over time, as found by Dickerson (1975) and Hyltenstam (1977) in their studies;

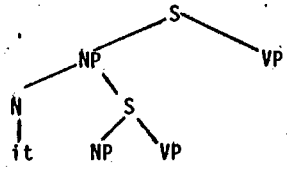
in other words, the difficulty of the environments for the subjects should remain in the same order over time with only the percentages of correct usage increasing over time.

3.2 Sentential Complementation

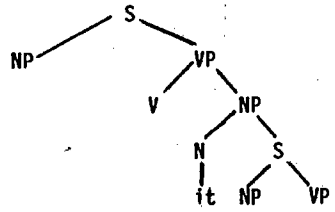
3.2.1 English Sentential Complementation

As Lawler and Selinker (1972) comment, with regard to second language acquisition, the topic of English sentential complementation is complex since it deals with several different types and levels of rules. Within the generative transformational framework (Chomsky 1957, 1965), complementation is a process whereby sentences are embedded inside other sentences. Complements may be of two types: noun phrase of verb phrase. Noun phrase complements are those complements embedded in the noun phrase (ie., subject) while verb phrase complements are those embedded in the verb phrase(ie., object). An illustration of the deep structure of a noun phrase complement is given in Diagram (1) and that of a verb phrase complement in Diagram (2):

(1) Noun Phrase Complement



(2) Verb Phrase Complement



Lakoff (1968) posits an "it" in the deep structure for all complements. Its presence accounts for sentences as (a) and (b):

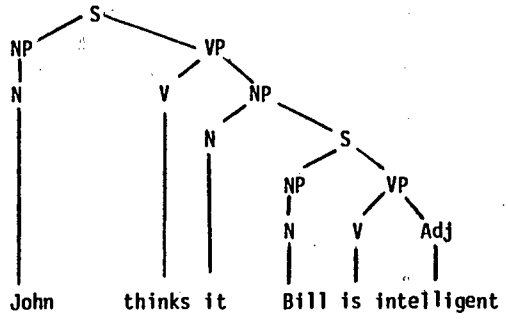
(a) It is likely to rain.
(b) I don't like it that you come home so late.

For the arguments motivating its presence, see Lakoff (1968).

There are three types of complementizing processes, resulting in three types of complement structures in the surface structure: in tradtional terms, clausal (*That*), infinitival (*Infin*), and gerundive (*Poss-ing*). These three types do not appear in the deep structure by one of these three complement processes plus other transformational rules.

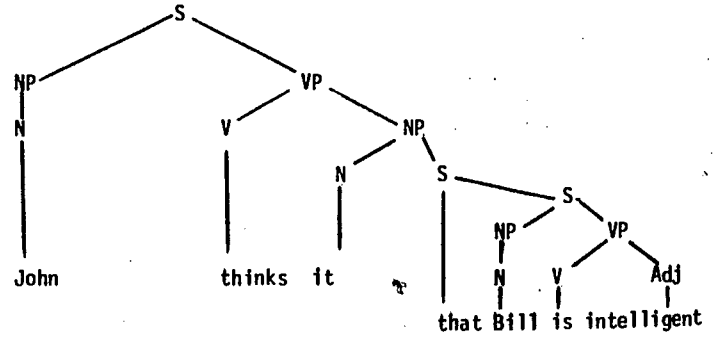
Clausal complements are of the form "John thinks that Bill is intelligent." In generative transformational grammar, this sentence would have the deep structure such as Diagram (3), which has "John thinks it" as the matrix sentence and "Bill is intelligent" as the embedded sentence:

(3)



To this deep structure, the *that*-complement rule is applied, yielding the structure in Diagram 4.

(4)



The *that*-complementizer rule removes the sentence boundaries of the embedded sentence and is formulated as rule (1):

Rule (1): Complementizer Placement

S.D.	S	it	=	S	=	X_2
S.I.	1	2	3	4	5	6
S.C.	1	2	0	that+4	0	6

Such a rule is a complement placement rule. Lakoff contends that all complements in the deep structure first undergo this complementizer placement rule since it has the least effect of all the complementizers on the deep structure. Lakoff thus considers the clausal complement to be the most basic (ie., the closest to the deep structure than any of the other forms) since it does not change the form of the embedded verb.

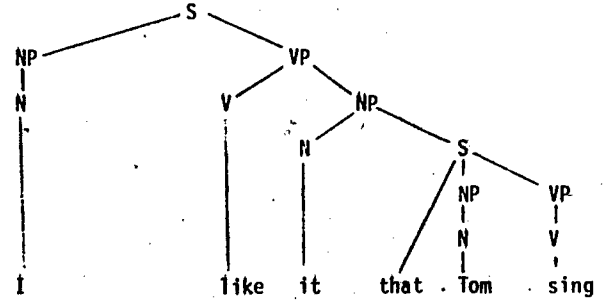
Verbs which appear with infinitival and gerundive complements undergo a rule of complementizer change after the complementizer placement rule. The *for-to* complementizer change rule deletes "that" and attaches "for" to the noun phrase and "to" to the verb of the embedded sentence:

Rule (2): *For-To* Complementizer

S.D.	X_1	that	NP	VP	X_2
S.I.	1	2	3	4	5
S.C.	1	0	for+3	to+4	5

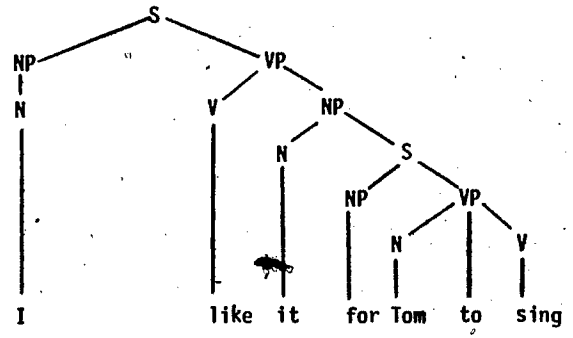
Thus, to a structure like Diagram (5):

(5)



the *for-to* complementizer change rule yields a strucutre like Diagram (6):

(6)



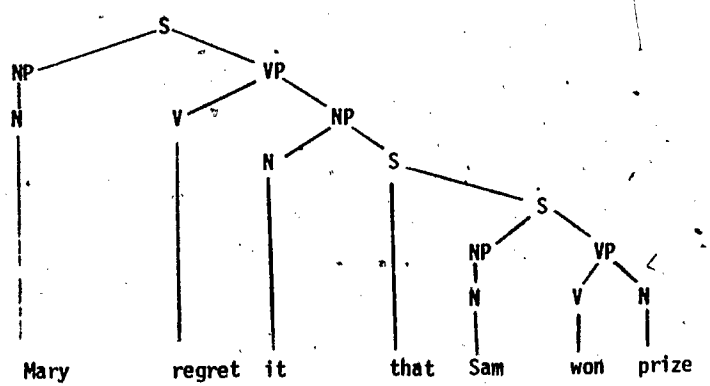
The *poss-ing* complementizer change rule attaches *poss* before the NP and *ing* before the verb. Later, a rule attaches 's after the NP and *ing* onto the verb.

Rule (3): *Poss-ing* Complementizer

S.D.	S_1	that	NP	VP	X_2
S.I.	1	2	3	4	5
S.C.	1	0	poss+3	ing+4	5

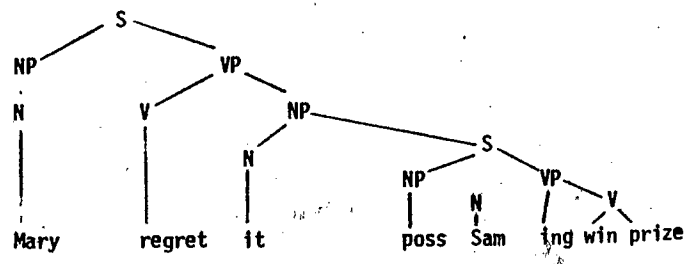
Thus, a structure like Diagram (7):

(7)



is transformed into Diagram (8):

(8)



Rules which state what complementizer change rule to use with a certain verb are called subcategorization rules, which is part of the lexicon component of the categorical part of the syntactic component. Some verbs like "want" allow only an infinitival complementizer; other verbs such as "think" undergo only the *that* complementizer placement rule. Verbs like "enjoy" undergo both the complementizer placement rule and the *poss-ing* complementizer change rule. Some verbs are marked for two complementizer rules. "Decide", for example, can either undergo only the complementizer placement rule (ie., "He decided that he should go.") or undergo both *that* and the *for-to* complementizer change rule (ie., "He decided to go."). "Admit", on the other hand, allows the complementizer placement rule (ie., "He admitted that he had broken the glass.") and the *poss-ing* complementizer change rule (ie., "He admitted breaking the glass."). Of course, there are verbs which undergo all three types of rules.

Restriction on what types of complementizing rules are allowed depends upon the matrix verb. In other words, complementation is rule-governed; the types of complementizing rules a particular verb allows must be learned for each verb. Riddle (1975) points out that the infinitive is used with verbs which express activity. *That*-complements appear mostly with verbs which refer to mental or physical states. Emotive verbs, such as "enjoy", take the gerundive complement. Most desiderative verbs like "wish" and "demand" take the *for-to* complementizer rule besides the complementizer placement rules.

Exceptions may, of course, occur within the meaning classes of verbs. For example, "mention", a verb of communication, takes not only a *that*-complement, which is the only complement such verbs usually allow, but a gerundive complement as well. Verbs of communication which allow only clausal complements are unmarked in the lexicon for complementizer change. When the verb is an exception, such as "mention", it is marked for that rule. This can be illustrated with "say", which allows only clausal complements, and "mention", which, although a verb of communication, allows the gerundive complement as well:

Say	*Mention*
$V_{communication}$	$V_{communication}$
u for-to	u for-to
u poss-ing	m poss-ing
u that	u that

Key: u = unmarked for a rule
m = marked for a rule

After the complementizer placement and complementizer change rules apply, other transformation rules apply to the structures derived: equi-noun phrase deletion, it-substitution, extraposition, it-deletion, that-deletion, for/poss deletion, and tough-movement.

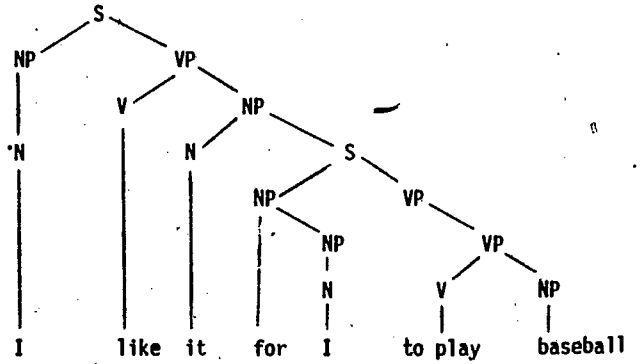
The equi-noun phrase deletion rule deletes the subject of the embedded sentence when it is co-referential with the subject in the matrix sentence.

Rule (4): Equi-Noun Phrase Deletion (END)

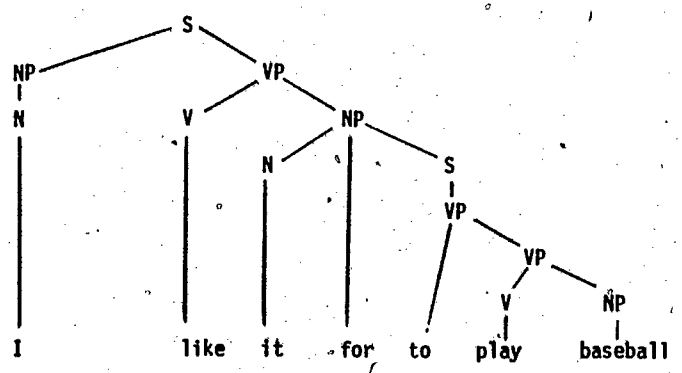
S.D.	X_1	NP_1	X_2	for poss	NP_3	X_3
S.I.	1	2	3	4	5	6
S.C.	1	2	3	4	0	6

The application of this rule, as the structural description indicates, is dependent upon the previous application of the *poss-ing* and *for-to* complementizer change rules. Thus, from a structure like Diagram (9) we would derive Diagram (10) after the application of END and tree pruning (ie., deletion of a node after its branches have been deleted).

(9)



(10)



It-substitution substitutes "it" for the subject of the embedded sentence, after this subject becomes the subject of the matrix verb:

Rule (5): *It*-Substitution

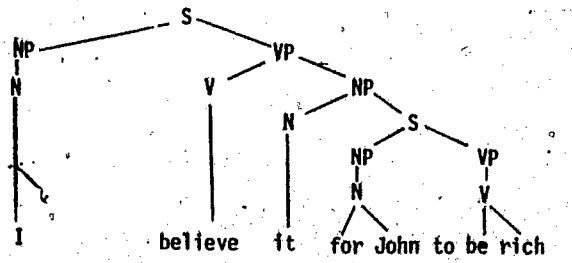
S.D.	X_1	it	for poss	NP	VP	X_2	NP	VP
S.I.	1_I	2_I	3_I	4_I	5_I	6_I	1_{II}	2_{II}

Conditions: 2-3-4-5 is an NP
3-4-5 is an S
4-5 is an S

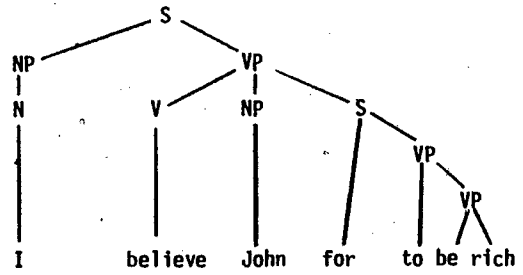
S.C. Substitute 4_I for 2_I
Delete 4_I
Adjoin $3_I - 4_I - 5_I$ to 2_I
Delete $3_I - 4_I - 5_I$

An illustration is the subject of the embedded clause in Diagram (11) becoming the object of the matrix verb in Diagram (12) and the subject of the embedded clause in Diagram (13) becoming the subject of the matrix verb in Diagram (14).

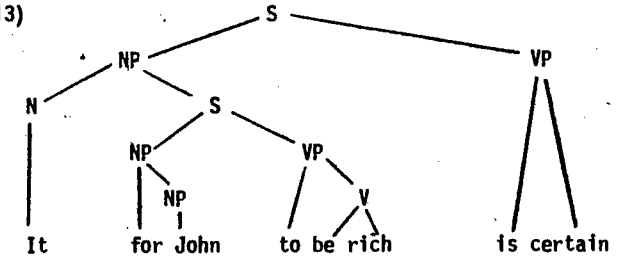
(11)



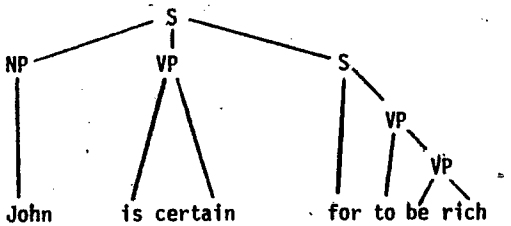
(12)



(13)



(14)



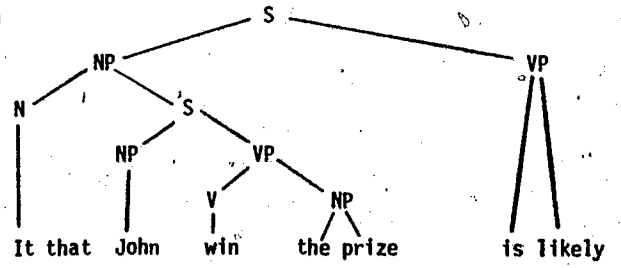
Extraposition moves an embedded sentence to the right of the matrix sentence, leaving the "it" in its original position.

Rule (6): Extraposition

S.D.	X_1	it	S	X_2
S.I.	1	2	3	4
S.C.	1	2	4	3

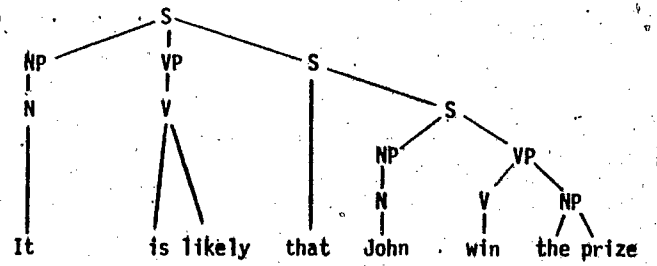
Thus from Diagram (15):

(15)



We would derive Diagram (16) through extraposition:

(16)



Although it is usually optional, with some strucutres extraposition is obligatory.

If extraposition has not applied, it-deletion then operates to delete the "it" preceding the complementizer:

Rule (7): *It*-deletion

S.D.	X_1	it	S	X_2
S.I.	1	2	3	4
S.C.	1	0	3	4

That-deletion accounts for the optional deletion of "that" when it is immediately preceded by a verb:

Rule (8): *That*-deletion

S.D.	X_1	V	that	S	X_2
S.I.	1	2	3	4	5
S.C.	1	2	0	4	5

Verbs which do not undergo this rule of deletion will be indicated in the lexicon.

For/Poss deletion deletes the *for* or *poss* before a verb after the subject has been removed by END or is-substitution.

Rule (9): *For/Poss* Deletion

	X_1	for / poss	VP	X_2
S.D.				
S.I.	1	2	3	4
S.C.	1	0	3	4

Besides the rules discussed above, two other rules are relevant to complementation. These are discussed by Green and Morgan (1972). The first is to-deletion, which deletes the "to" of the infinitive belonging to verbs of perception of a set of verbs including "make," "let," and "have."

Rule (10): *To*-deletion

	X_1	to	V	X_2
S.D.				
S.I.	1	2	3	4
S.C.	1	0	3	4

Conditions: V is { verb of perception, let, make, have }

Tough movement takes any NP, excluding the subject, out of the embedded sentence, and substituting the NP for "it" in the matrix sentence.

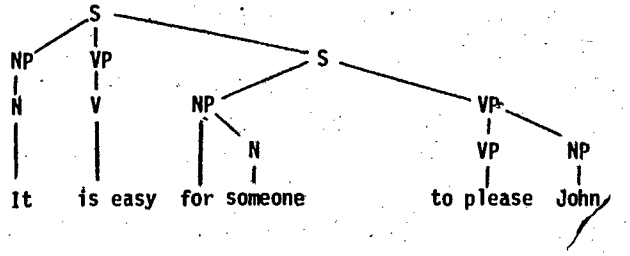
Rule (11): Tough Movement

	X_1	it	VP	X_2	NP	VP	NP
S.D.							
S.I.	1	2	3	4	5	6	7
S.C.	1	7	3	4	5	6	0

Condition: VP consists of Be + Adj / Noun Phrase like { a joy, a chore }

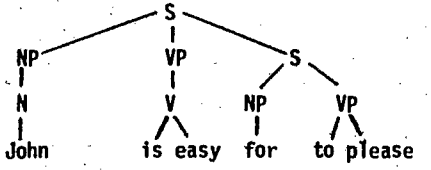
Thus, a sentence like Diagram (17):

(17)



can be transformed into Diagram (18) through tough movement:

(18)



3.2.2 Finnish Complementation

The analysis of Finnish complementation presented here is more limited than that for English complementation. This is because there has veen very little research on Finnish complementation and it is not within the scope of this work to do a comprehensive analysis. This analyis of Finnish complementation has been provided only as a reference for the discussion of native language interference, which appears later.

Finnish has four types of complements: clausal, infinitival, participial, and verbal noun. Clausal complements are introduced by "että", which is equivalent to English "that". There are four forms of the infinitive in Finnish, traditionally numbered I, II, III, and IV (Whitney 1973). A fifth infinitive (number V) is sometimes added to this list.

Infinitive I is formed by the addition of the suffix -ta- (-tä-) to the stem, plus modifications. It is used with verbs such as "haluta" ("want") and "ajatella" ("think about"):

(a) Haluan mennä.
I want to go.

(b) Ajattelen mennä matkalle.
I am thinking about going on a trip.

Besides its use in complement structures, Infinitive I is the form used with auxiliary verbs (eg., "Osaatko uida?"-- "Can you swim?"). It is also the form found in such constructions as "Kirja on hyvä lukea." ("The book is good to read.") and "Parempi katsoa kuin katua." ("It is better to look than to regret."). The object of this infinitive is in the short accusative case.

Infinitive II is formed by a consonant plus -e-, with modifications as with Infinitive I. This suffix is added before either the inessive or instructive case. The inessive indicates the simultaneity of one action with another:

(c) Tädin kaataessa kahvia kuppeihin tuijotti Eeva ikkunasta ulos.

(d) While her aunt was pouring coffee into the cups, Eeva stared out the window.

This infinitive is also used with such verbs as "nauraa" ("laugh at") and "olla pahoillaan" ("resent"):

(d) Nauroin kuullessani sen.

I laughed when I heard it.

(e) Mary oli pahoillaan Samin voittaessa palkinnon.

Mary resented it when Sam won the prize.

In sentences like (d) and (e), the infinitive is given a clausal interpretation. When infinitive II is used with the instructive case, it indicates the manner of the main action;

(f) Pullo lensi suhisten halki ilman.

The bottle flew whistling through the air.

The third infinitive--Infinitive III-- has the ending -ma- (-mä-) added to the stem of the verb, resulting in "sanoma-": from "sano-" ("to say"). This form of infinitive is found with such verbs as "auttaa" ("help"):

(g) Mary auttoi Johnia opiskelemaan.

Mary helped John study.

The lengthening of the vowel and the -*n* added after Infinitive III ending (ie., -ma-) indicates the illative case, which indicates aim or destination. This combination of Infinitive III and the illative case expresses an action which is to be done or for which one is prepared

or represents the object of another verb, the beginning of an action, etc. With the inessive case, current action is indicated:

(h) Hän on työhuoneessaan kirjoittamassa kirjettä.

He is in his study writing a letter.

Infinitive III plus the elative case indicates an action from which the subject comes, ceases, or is forbidden. Verbs which call for this elative case include "estää" ("prevent") and "laka(t)a" ("cease"):

(i) On lakannut satamasta.

It stopped raining.

Infinitive IV has two forms. One form ends in -minen and is used in idiomatic expressions only:

(j) Sinun on nyt laulaminen.

You have to sing now.

The other form end in -mista and is used in sentences like:

(k) Tässä ei nyt ole selittämistä.

There is nothing to explain here.

Complements in Finnish are also formed with a verbal noun. The verbal noun is formed by the addition of the suffix -minen. It can be fully inflected and is obligatory with certain verbs, such as "nauttia" ("enjoy"):

(m) Hän nautti pesäpallon pelaamisesta.

He enjoyed playing baseball.

The last type of complement is participial. The present participle is found in such complement structures as:

(n) Haluan Johnin menevän.

I want John to go.

The present participle is formed by the addition of the suffix -va (-vä) to the stem. The perfect participle is formed by the addition of -nee- (-nut-, -nyt-) to the stem. The perfect participle is used with such verbs as "myöntää" ("admit"):

(o) Pieni poika myönsi rikkoneensa ikkunan.

The little boy admitted breaking the window.

3.3 Second Language Acquisition Studies on English Sentential Complementation

Few second language acquisition studies have focused on complementation. The most detailed has been the study made by Andersson (1976) on students at the Catholic University in Puerto Rico learning English. Other studies include Hart and Schacter (1976), Tagey (1977), Scott and Tucker (1974), and d'Anglejan and Tucker (1975).

3.3.1 Production Studies

Anderson did a cross-sectional study of 180 students studying English at the Catholic University in Puerto Rico, ranking in age from nineteen to thirty-nine. Her subjects varied in levels of proficiency. Her test consisted of multiple choice and translation items. Using the "ordering theoretic method" by Bart and Krus (1973), she found the followind order of difficulty:

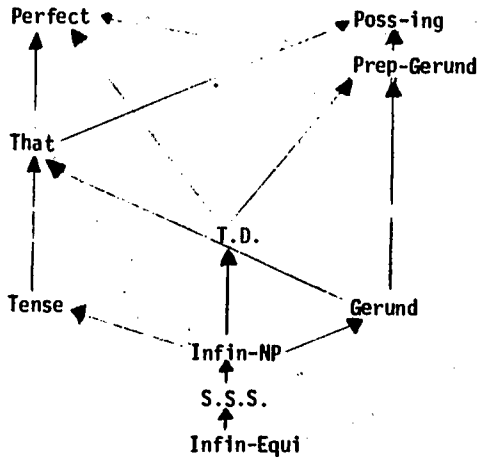


Fig. 4. Anderson's (1976) Order of Acquisition

Below are examples of the different categories (Anderson 1976):

Complementation Structures	*Example*	*Description*
That	John thinks *that he* speaks English well.	That complement
Poss-ing	I remember *your finish-ing* it last week.	Gerund complement in which subject has possessive form

Complementation Structures	*Example*	*Description*
Gerund	I finished *studying* English.	Gerund complement to which Equi-Noun-Deletion applied
Prep-Gerund	Mary concentrated *on solving the problem.*	Gerund complement which is preceded by a preposition and to which Equi-Noun-Deletion applied
Infin-NP	I wanted *you to leave.*	Infinitive complement which has undergone It-Substitution and the subject is in the accusative form
T.D.	My mother doesn't *let me watch* T.V.	Infinitive-Noun Phrase complement whcih has undergone To-Deletion
Infin-Equi	I want to see it.	Infinitive complement which has undergone Equi-Noun-Deletion
Tense	I know that he left early.	Sequence of tense rules with That complement
Perfect	She hopes to have read it by next week.	Sequence of tense rules Infinitive complement
S.S.S.	I want *you* to help them.	Surface Structure Subject constrait

The order found by Anderson did not match her predicted order based on the Derivational Complexity Hypothesis (DCH) (Brown and Hanlon 1970). DCH has been shown to correctly predict the order of acquisition for structure in L_1 and is based on the number of transformations in the derivational history of a structure. Based on the number of transformations involved, the predicted sequence would be:

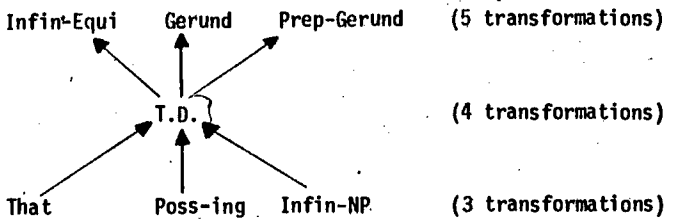


Fig. 5. Predicted order based on DCH

The acquisition of S.S.S. and Tense were not predicted by the derivation complexity metric since they represent only a part of sentential complements.

As Anderson points out, Infin-END constructions are easier although derivationally they are more complex. In fact, she found that in no case was a complement with a surface subject easier than its END form. Thus, as Infin-Equi is less difficult than Infin-NP, so Gerund is less difficult than Poss-ing. Moreover, That, which has a surface structure subject and is less complex transformationally than the Gerund and Infin-Equi constructions, is acquired later. Based on these data, Anderson posits a communicative strategy called the *economy principle*-- the tendency to learn to produce the shorter form first. For in terms of the number of morphemes apparing in the surface structure, forms with Equi are shorter.

Anderson also investigated the role of transference and its influence on the acquisition of sentential complementation. Her data indicated that the task of producing a That complement was less difficult when the stimulus sentence contained a *que* ("that" in Spanish) and that producing an infinitive was less difficult when the stimulus had an infinitive. Thus, she states that the form of the complement in the stimulus sentence influences the facility of producing the correct complement in English. Anderson also found rather strong evidence for positive transfer in the responses to items requring the Gerund or That complements. The ratio of That complements to Gerund complements was higher when the stimulus sentence contained an infinitive than when it had a That complement.

Negative transfer is evidenced by the high percentage of infinitive responses when the stimulus sentence is an infinitive. When the stimulus sentence contained an infinitive, the occurrence of incorrect

infinitive responses was 22.8 percent while with a That complement it comprised only 7.8 percent of the total responses. This same type of negative transfer was seen with respect to incorrect That responses when the stimulus sentence contained a That stimulus.

Anderson found no evidence that the type of testing task influenced the response produced. The degree of transfer for multiple choice and translation items was approximately the same.

Given that two types of complement responses were correct, Anderson studied which complement was most likely to be chosen. Her investigation revealed that choices in such instances paralleled the ordering sequence. For example, if Poss-ing and That were appropriate, students would choose That more often than Poss-ing. In the sequencing, Poss-ing came last. The same type of occurrence was found with *decidir* ("decide" in Spanish). Given the choice of either an Infinitive or That complement, the infinitive was chosen more often than the That complement, even when the stimulus sentence contained a That complement. That did appear more often when the stimulus sentence contained a That complement, indicating positive transfer as discussed above.

With respect to the relationship between the lexical class of the main verb and the choice of complement, Anderson found that the meaning of the main verb may influence the choice of the complement. She cites the example of *believe* and *persuade*. While *believe* belongs to the class of verbs of mental activity, *persuade* is associated with desiderative or imperative verbs. And as Lakoff (1968) points out, verbs of mental activity normally take That complements while desiderative verbs and imperative verbs allow usually only the infinitive. Indeed, although *believe* and *persuade* allow both types of complements, the infinitve was used with persuade and That with *believe*. As Anderson (1976: 71) comments,

> It may be possible that the second language learner acquires this knowledge and uses it to determine which complement form to select for a given verb. Therefore, rather than view these results as counter-evidence to positive transfer the responses could be viewed as possible evidence for another conflicting determinant of complement choice: that of the lexical class of the verb in the matrix sentence.

Besides the less difficulty of infinitive complement structures and its preference over That complements, there is a high percentage of overgeneralization in comparison with other complements. Anderson explains this pehenomenon by favoring the economy principle.

Another study on complementation was mady by Hart and Schacter (1976). They studied the compositions written by Spanish, Arabic, Persian, Japanese and Chinese students in order to determine the frequency of relative clauses and complement structures. They found that post-verbal infinitive complements outranked the That complements and Gerund complements for all linguistic groups except the Japanese, for which Infinitive and That complements were fairly close. An argument against transference is found in the Persians preferring Infinitive complements since Infinitive complements never appear in post-verbal position in Persian. Only finite complements can follow the verb. Yet although the Infinitive complement was almost universally preferred, native Spanish speakers used it more frequently than any other language group. Hart and Schacter contend that the preference for the Infinitive complement cross-linguistically is due to the economy princinple.

Tagey (1977), in her investigation of anaphoric reference with regard to complementation, also found the overuse of the infinitive in Persian speakers. These data support the contention of Hart and Schacter that this overuse is not the result of interference.

Scott and Tucker (1974), in their investigation of twenty-two Arabic students learning English at the American University of Beirut, found that the two most common errors with complements were the use of the past participle instead of the infinitive after *to* (eg., "Then they had *to went* down and tried *to pushed* it forward.") and the substitution of *for+V+ing* or *for+infin* for *to+infin*. Complements in the writing samples were used incorrectly eighteen percent of the time at Time I and twelve percent of the time at Time II; in the speech samples, they were used incorrectly twenty-one percent of the time at Time I and ten percent of the time at Time II.

3.3.2 Comprehension Studies

With regard to comprehension, Anderson focuses on four items: *promise* (eg., "Carmen promised Mary to sing."), Regular NVN Pattern (eg., "John permitted Mary to leave."), Tough Movement (eg., "The man is difficult to see."), and It-Substitution (eg., "The child is certain to cry."). Anderson found that Tough Movement and It-Substitution constructions were more difficult than the regular pattern. *Promise* and the regular pattern were equally difficult.

The NVN (Noun-Verb-Noun) pattern processing strategy has been discussed by Bever (1970). According to this strategy, any noun-verb-

noun sequence will be interpreted as being "actor-action-object." Thus, a sentence like

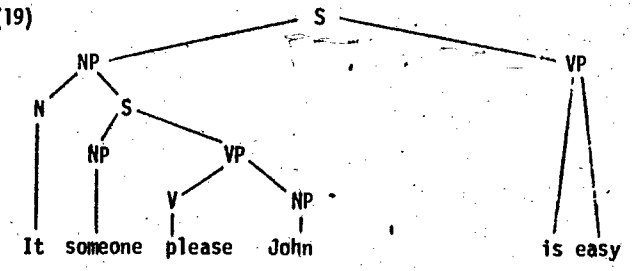
(a) John is easy to please.

and a sentence like

(b) John is eager to please.

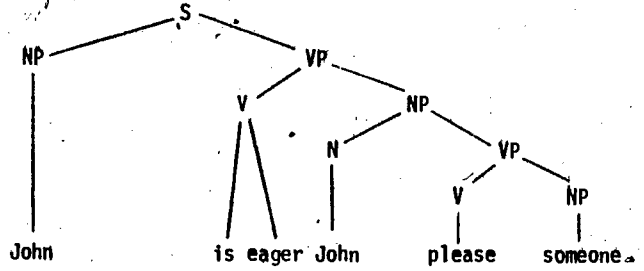
have different deep structures although on the surface they look identical. Sentence (a) has a deep structure as in Diagram (19):

(19)



The deep strucure for sentence (b) is given is in Diagram (20):

(20)



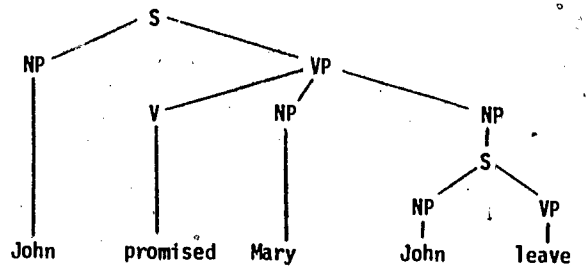
As sentences (a) and (b) have identical surface structures but must be interpreted differently, so this same relationship exists between sentences like (c) and (d):

(c) John promised Mary to leave.

(d) John asked Mary to leave.

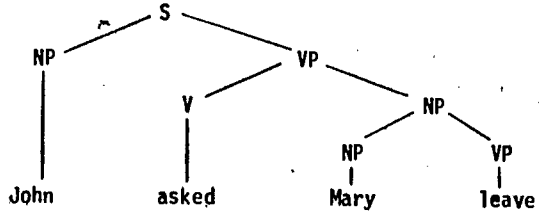
Sentence (c) has the following deep strucure:

(21)



Sentence (d), on the other hand, has the following deep structure:

(22)



According to the NVN processing strategy, a sentence like (a) would be interpreted as John doing the pleasing and a sentence like (c) would be interpreted as Mary leaving.

Carol Chomsky (1969), in her investigation into first language acquisition, found a tendency for subjects to interpret a sentence like "John promised that Mary would leave" as Mary being the subject of *leave*. Chomsky terms this principle which allows the NP most closely preceding the complement verb to be interpreted as the subject of that verb the *Minimal Distance Principle*.

Based upon the NVN strategy and the Minimal Distance Principle, the following sequence of acquisition was predicted by Anderson:

NVN	eg., John asked Mary to leave.
It-Substitution	eg., John is likely to win.
Tough Movement	eg., John is easy to please.

and

NVN	eg., John asked Mary to leave.
Promise	eg., John promised Mary to leave

The NVN strategy predicts that sentences like "John is easy to please" and "John is likely to win" will be more difficult than sentences which follow the regular pattern (ie., NVN = actor-action-object), such as

"John asked Mary to leave". This strategy also implies that a sentence like "John is easy to please" will be more difficult than "John is likely to win" because the subject NP in the former sentence is actually an object in the embedded sentence in the deep structure. The latter sentence, on the other hand, in which It-Substitution has applied, closely resembles the deep structure because the surface structure subject of the matrix sentence is the logical subject of the complement in the deep structure. The Minimal Distance Principle predicts that sentences like "John promised Mary to leave" will be more difficult than a sentence like "John asked Mary to leave" since the subject of the matrix verb in the former sentence is the subject of *leave* although *Mary* is closer to *leave*.

The prediction that NVN structures would be less difficult than Tough Movement and It-Substitution was borne out. That Tough Movement would be more difficult than It-Substitution was not evidenced, nor was the promise construction more difficult than the NVN construction.

Anderson credits the facility of Tough Movement constructions over It-Substitution constructions to native language transference. In Spanish Tough Movement occurs with adjcetives like *difícil* and *imposible* ("difficult" and "impossible", respectively, in Spanish) while It-Substitution never applied to predicate adjective constructions (Sauer 1972). Errors with It-Substitution were thus higher because such a construction does not have a parallel construction in Spanish, according to Anderson. It is interesting to note that the responses on It-Substitution sentences varied according to the adjective involved. There was a greater tendency to incorrectly assign a human subject to the *seguro* ("sure" in Spanish) construction than there was to the *cierto* ("certain" in Spanish) construction. In Spanish, *seguro* can occur with both an impersonal and human subject while *cierto* can only occur with an impersonal subject.

Although the NVN strategy did not correctly predict the relative difficulty of Tough Movement and It-Substitution, there was evidence of its use in interpreting such constructions. With It-Substitution constructions, Anderson found the tendency of interpreting the first noun in the sentence as the agent resulting in "The candidate is sure to win" becoming "The candidate is sure that he will win." Such a strategy was also evident with Tough Movement constructions, resulting in sentences like "The man is difficult to see" being interpreted as meaning "The man has difficulty seeing."

Thus, structures which follow the NVN pattern were the easiest to comprehend. Moreover, there was a tendency to assign the role of agent to the first noun in the sentence. In addition, the similarity between a sentence in the native language and that of the target language facilitated the learning ease of that construction.

Another study dealing with the comprehension of complement structures was that made by d'Anglejan and Tucker (1975). In this study, the acquisition of a set of complex English structures by adult French Canadians learning English who were at two different levels of proficiency was investigated. Included in this study were sentence structures like "John is eager/easy to please" and "He promised/asked Bill to leave." D'Anglejan and Tucker found that for the beginning students the *easy* structures had the highest proportion or errors, followed by *ask* and *promise* respectively. For the advanced students, the same ordering was found, although the difference in errors between the *easy* and *ask* structures was only one percent.

3.3.3 Production Studies vs. Comprehension Studies

Anderson found that Infinitive and That complements were equally difficult in comprehension while Infinitive complements were easier in production. She attributes this to the kind of task involved: in other words, the production task involved producing a string of words for which the meaning is already known while in the comprehension task students assign meaning to a string of sounds or words. Length may be a factor in determining the facility of a task. On the whole, production errors were higher than comprehension errors.

The finding of higher errors in production than in comprehension is quite common in the literature on second language acquisition. The ability to comprehend a specific syntactic structure often develops faster than the ability to produce that structure. The problem has been as to how to account for this phenomenon in a theoretical model of language acquisition. Often two different grammars, a "production" grammar and a "comprehension" grammar, are postulated (Naiman 1974; Swain, Dumas, and Naiman 1974). But Tarone (1974 suggests that the discrepancy between an individual's comprehending ability and producing ability can be accounted for by Neisser's (1967) model of speech perception. Neisser's model emphasizes the importance on non-linguistic processes and strategies in language comprehension. An example of such type of strategy would be that proposed by Bever (1970: 298):

"Any Noun-Verb-Noun sequence within a potential internal unit in the surface structure corresponds to actor-action object."

3.3.4 Conclusion

Anderson found an invariant order in the acquisition of English sentential complements. Although she posits this as an order of acquisition, a more appropriate term would be that of a hierarchy of difficulty. The notion of the derivational theory of complexity did not successfully predict this hierarchy of difficulty. In addition, Anderson found that the production of complementation structures was influenced by an economy strategy and native language transference, with the economy strategy responsible for the ease of shorter complements and the native language transference accounting for the ease of structures paralleling native language equivalents. The Infinitive complement was found not only to be the easiest of the complement structures but also the most overgeneralized. With regard to comprehension, Anderson found evidende for the influence of the NVN strategy in processing sentences. Native language also had an influence on the comprehension of structures. With regard to the comprehension versus the production of a complement structure, it was found that structures were easier in comprehension than in production. Moreover, structures difficult to produce were not always difficult to understand. Anderson posits this to be the result of a length constraint operating in production but not in comprehension.

3.4 Research Design

3.4.1 The Subjects

For the cross-section study, forty-three students studying English at the University of Jyväskylä, Finland, were tested. These students were made up of twenty-one Approbatur (ie., first-year) students, twenty-three Cum Laude (ie., second-year) students, and two Laudatur (ie., third-year) students. For the longitudinal study, twenty-one of these forty-three students were used. This included twelve Approbatur and nine Cum Laude students. All students ranged in age from eighteen to twenty-eight, the average age being nineteen. The average number of years of having studied English was five years, the actual number ranking from two students with three years, one student with six years, ten students with seven years to three students with eight years. For

four students, there was no information. Two of the students had lived in the United States for one year.

3.4.2 Testing Procedure

3.4.2.1 The Test

A ninety-six-item test, covering various aspects of complementation, was developed and administered three times during the 1974-1975 academic year--in the fall (September), midwinter (January), and in the spring (April). Forty-three students took the test in the fall, with twenty-one of these students taking the test both in January and in the spring.

The test covered two types of complementation rules: subcategorization and syntactic rules. Subcategorization rules are used in the correct selection of the complement-type each verb allows; syntactic rules account for the correct representation of the complment-type. Table 1 presents the thirteen subcategorization categories; Table 2 presents the six syntactic categories. Both tables include the verbs used in each category and the item numbers. Table 1 also lists the type of complements used in the Finnish equivalent as a reference for the discussion of interference.

The test consisted of seven sections, each with a different type of task:

I. Translation

Eg., Haluan että John menee.

_____

II. Fill in the Blank

Eg., Bill recommended that they _____ to the show. (to go)

TABLE 1. PRODUCTION SUBCATEGORIZATION CATEGORIES

Categories	Examples	Verb(s)	Item Number(s)	Finnish Complement(s)
That	John thinks that Bill is intelligent.	think	I.5; III.4; IV.4	että, present participle
Infin-NP	I want John to go.	want help	I.1; III.1 I.2; VI.7	että, present participle infinitive III
Infin-END	I want to go.	want	II.3; IV.1; VI.6	infinitive I
Poss-ing	He enjoyed Mary's singing.	enjoy prevent (from)	II.13; III.13 III.5	verbal noun infinitive III
Gerund	He enjoys playing baseball.	enjoy finish can't help	I.8; V.19 I.9; IV.7; VI.5 IV.4	verbal noun että, infinitive I infinitive III
Prep+Poss-ing	I was delighted at his coming.	think about to be delighted at	VI.3 II.7	verbal noun että, verbal noun
Prep+Gerund	He believes in playing baseball.	think about plan on believe in laugh at to be interested in	III./ V.1; VI.13 V.15; VI.10 II.1 III.9	infinitive I infinitive I verbal noun infinitive II verbal noun
Infin-NP/That	Mary expected John to sell his car./Mary expected that John would sell his car.	expect promise decide hope demand	III.10; VI.1 I.3 IV.9; VI.5 III.12 III.8	että, present participle että että että, present participle että, infinitive III
Infin-END/That	Mary promised to go./Mary promised that she would go.	promise	IV.6	että, infinitive I.
		plan	III.3	että, infinitive I
		decide	I.4	present participle että, infinitive I.
		hope	VI.12 V.16	että present participle
Poss-ing/That	Mary resented Sam's winning the prize./Mary resented (it) that Sam won the prize.	resent	III.11	että, infinitive II.
		suggest	III.14	verbal noun että, verbal noun
Gerund/That	The little boy admitted breaking the window./The little boy admitted that he had broken the window.	admit deny	I.7; IV.10; VI.14 III.2; VI.11	että, perfect participle että, perfect participle
Infin-NP/Gerund	I heard the tree fall./I heard the tree falling.	hear see	I.12; II.9 II.2; V.5	että, present participle että, present participle
Infin-END/Gerund	I like to play baseball./I like playing baseball.	like	II.10; V.21	verbal noun

TABLE 2. PRODUCTION SYNTACTIC CATEGORIES

Categories	Examples	Verb(s)	Item Number(s)
To-Deletion	The guard let the people enter.	let	II.14; V.8
		hear	I.12; II.9
		see	II.2; V.5
		make	V.4; V.20
		should have	V.13
To Be-Deletion	The doctor made Mary well.	make	II.4; II.12; V.11
For-To	For him to be rich is unfair.	to be good	II.5
		to be necessary	III.4
		to be bad	III.15
		to be impossible	V.10
		to be rich	V.12
Possessive	He enjoyed Mary's singing.	resent	III.11
		enjoy	II.13; III.13
		suggest	III.14
		prevent	III.5
		to be delighted at	II.7
		think about	VI.3
		forget about	VI.6
		to be good	II.5
		regret	V.2
Tense Sequencing	Bill recommended that they go to the show.	expect	III.10; VI.1
		promise	I.3; IV.6
		plan	III.3
		decide	I.4; IV.9; VI.5
		hope	III.12; VI.12
		think	I.5; III.6; IV.8
		resent	III.11
		admit	I.7; IV.10; VI.14
		deny	III.2; VI.11
		demand	III.8
		suggest	III.14; V.9
		recommend	II.8
		insist	II.11
Raising	John is likely to go to Chicago.	likely	II.6; III.16; V.6; V.17

III. Transformational Drill

Eg., Bob wanted it. Sam did pass his exam.

_____

IV. Sentence Completion

Eg., The students can't help _____.
They are angry.

V. Multiple Choice

Eg., No one regrets a. them going away
b. for them
c. their
d. for their

VI. Substitution

Eg., Mary thinks that John went to Chicago
Mary forgot about _____

VII. Comprehension

Eg., John is eager to please

John pleases someone. Yes _____ No _____
Someone pleases John. Yes _____ No _____

Distractors for the multiple choice section of the test were derived from two sources: 1) the types of errors discussed by Kurt and Kiparsky (1972) and 2) the type of errors made on an English proficiency test taken by several Finnish students enrolled in the Intensive English Institute at the University of Illinois, Champaign-Urbana. The complementation test was pretested with native speakers.

3.4.2.2 Data Analysis

2.3.2.2.1 Hierarchy of Difficulty

In order to determine the hierarchy of difficulty for the nineteen categories, the ordering-theoretic method developed by Bart and Krus (1973) was utilized. Because of its origin in mathematical tree theory, this method is also known as the "tree method." Unlike A Guttman scaling, which "invariably assume(s) that the trait measured is linearly ordered and can be measured with a single additive model" (Bart and Krus 1973: 291), the tree method is designed to determine the logical relationship

among items. In other words, the method seeks to determine groups of items acquired together. For example, given twelve items to be ordered, the differences between the Bart and Krus method and the traditional Guttman method is exemplified below. The Bart and Krus "tree method" would yield a ranking as in Figure (6a) while the Guttman analysis would yield a figure like (6b).

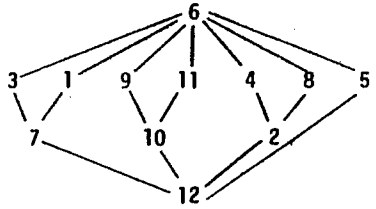


Fig. 6a. Bart and Krus Analysis

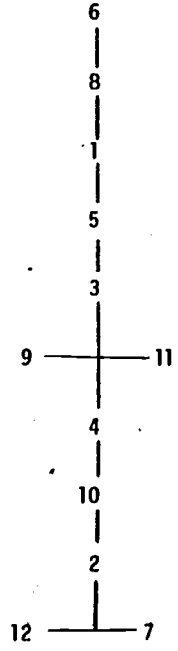


Fig. 6b. Guttman Analysis

In the Bart and Krus ordering method, item "2" is a prerequisite to item "8" while item "5" is independent of item "8." The Guttman method cannot provide such information. According to the Guttman ranking, item "2" must be ordered before item "8" but so would item 5. There is no indication that item "5" is independent of item "8." Thus, the Bart and Krus method yields information as to the sequencing among items which the Guttman method cannot.

As with the Guttman scaling, binary coding is necessary in the data analysis for the Bart and Krus tree method. A "1" is assigned to a category for a subject if that subject received a score of ninety

percent or higher; for a score below ninety percent, a "0" is assigned. The percentages are determined by dividing the number of correct items by the total number of items for that category by an individual:

Individual 16

Category	*# Correct Items/# Total*	*Percentage*	*Binary Score*
That	2/3	66.67	0
Poss-ing	3/3	100.0	1
Gerund	4/6	66.67	0
Pre+Poss-ing	3/3	100.0	1
.	.	.	.
.	.	.	.
.	.	.	.

The second step in the procedure involves counting the response patterns on all possible pairs of structures for the forty-three subjects. Consider the binary scores for three categories for several of the subjects below:

		Categories		
		That	*Poss-ing*	*Infin-End*
	01	1	1	1
	02	1	1	1
	.	.	.	.
	.	.	.	.
Individual Subjects	.	.	.	.
	15	1	1	1
	16	0	1	1
	17	0	1	1
	18	1	0	1
	.	.	.	.
	.	.	.	.
	.	.	.	.
	20	0	0	1
	.	.	.	.
	.	.	.	.
	.	.	.	.

The response patterns of *00*, *10*, and *11* are considered to be confirmatory; *01* is a disconfirmatory response pattern. For example, in the above chart individuals 20, 18, and 15 show confirmatory responses for the categories *That* and *Poss-ing*.

	That	*Poss-ing*
Individual 20	0	0
Individual 18	1	0
Individual 15	1	1

This means that these responses confirm that one item is a prerequisite to another (in this case, that *That* is a prerequisite to *Poss-ing*). The response pattern by individual 16 is disconfirmatory; it disconfirms that *That* is a prerequisite to *Poss-ing*.

	That	*Poss-ing*
Individual 16	0	0

The third step involves counting the number of disconfirmatory responses for each possible pairs of categories; in this case, with three categories, there would be six possible pairs: *That/Possing*, *That/Infin-END*, *Poss-ing/Infin-End*, plus these pairs in reverse--*Poss-ing/That*, *Infin-END/That*, and *Infin-END/Possing*.

Individual	*Categories* That	Poss-ing	Type of Response	*Categories* Poss-ing	That	Type of Response
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
16	0	1	Disconf.	1	0	Confirm.
17	0	1	Disconf.	1	0	Confirm.
18	1	0	Confirm.	0	1	Disconf.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
Total Confirmatory:	32			Total Confirmatory:	39	
Disconfirmatory:	9			Disconfirmatory:	4	

The number of disconfirmatory responses for each pair is divided by the number of subjects involved in the study:

	That/Poss-ing	*Poss-ing/That*
Disconfirmatory Responses	9	4
Number of Subjects in Study	43	43
Percentage	20.9	9.5

	That/Infin-END	*Infin-END/That*
Disconfirmatory Responses	12	0
Number of Subjects in Study	43	43
Percentage	27.9	0.0

	Poss-ing/Infin-END	*Infin-END/Poss-ing*
Disconfirmatory Responses	7	0
Number of Subjects in Study	43	43
Percentage	16.3	0.0

The ideal would be if for one pair (eg., *That* and *Poss-ing*) there were all disconfirmatory responses and for the reverse pair (eg., *Poss-ing* and *That*) there were none.

	That/Poss-ing	*Poss-ing/That*
Disconfirmatory Responses	43	0
Number of Subjects in Study	43	43
Percentage	100	0.0

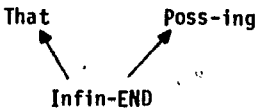
This would mean that for all subjects one item was a prerequisite for the other.

These percentages for the disconfirmatory responses are then put in a matrix:

Matrix of Disconfirmatory Responses

	That	*Poss-ing*	*Infin-END*
That	----	20.9	27.9
Poss-ing	9.5	----	16.3
Infin-END	0.0	0.0	----

Allowing for no tolerance level, ie., no performance errors, item pairs that are related in a prerequisite manner can be discerned from the entries of *0.0* in the matrix. In other words, when a *0.0* appears, it means that item pairs are related in a prerequisite manner. Thus, from the matrix above, it can be seen that *Infin-END* is a prerequisite to *That* and *Poss-ing*. Because there are no *0.0*'s between the *That* and *Poss-ing*, no prerequisite relationship is evident. From this matrix, a "tree" can be constructed to show the prerequisite relationship between *Infin-END* and the other two items.



3.4.2.2.2 Longitudinal Analysis

In order to determine significant changes over time for the categories, the "analysis of variance" statistical program in the SOUPAC system was utilized. In order to determine correlations among items for each testing, an ANOVA statistical program in the SOUPAC system was used.

CHAPTER 4

RESULTS

The first section of this chapter presents an ordering of the nineteen subcategorization and syntactic categories, based on the percentage of error. Next, a hierarchy of difficulty is established, illustrating the sequential relationships among the categories. An examination of complement preference and type of error follows, along with a discussion of the role of transference. Finally, the longitudinal data for both the subcategorization and syntactic categories and for the individual are examined.

4.1. Production

4.1.1 Cross-Sectional Data

4.1.1.1 Rankings

Table 3 presents the ranking for the thirteen subcategorization categories based on the percentage correct for each category. As can be seen, three categories received a percentage of 100 percent: *Infin-END, Infin-END/Gerund* and *Infin-NP/Gerund*. Two categories received scores of ninety-four percent correct: *Prep+Gerund* and *Infin-NP*, followed by *Infin-END/That* with a score of ninety-three percent. *Gerund* and *Prep+Poss-ing* both received scores of ninety-one percent correct. These categories are followed in turn by *Poss-ing* with eighty-nine percent and *That* with eighty-seven percent correct. *Infin-NP/That* had seventy-eight percent correct, while *Poss-ing/That* had sixty-eight percent correct. The most difficult category was *Gerund/That* at sixty-one percent correct. Thus, except for the last three categories, most of the subcategorization categories received fairly high scores; eight out of thirteen categories received scores above ninety percent correct.

TABLE 3

SUBCATEGORIZATION CATEGORIES

Ranking	Percentage of Correct Responses	Category
2	100	Infin-END
2	100	Infin-END/Gerund
2	100	Infin-NP/Gerund
4.5	94	Prep+Gerund
4.5	94	Infin+NP
6	93	Infin-END/That
7.5	91	Prep+Poss-ing
7.5	91	Gerund
9	89	Poss-ing
10	87	That
11	78	Infin-NP/That
12	68	Poss-ing/That
13	61	Gerund/That

Table 4 presents the percentages of correct responses for the six syntactic categories. Of these six categories, *To-Deletion* had the highest percentage correct, with a score of ninety percent. This category is followed by *For-To* with seventy-nine percent, which, in turn, is followed closely by *To Be-Deletion* with a score of seventy-eight percent correct. *Possessive* had a score of seventy-one percent correct; *Tense Sequencing* and *Raising* had the lowest scores, with sixty-nine percent and fifty-one percent respectively.

TABLE 4

SYNTACTIC CATEGORIES

Ranking	Percentage of Correct Responses	Category
1	90	To-Deletion
2	79	For-To
3	78	To Be-Deletion
4	71	Possessive
5	69	Tense Sequencing
6	51	Raising

In sum, all of the percentages of correct responses were high for both the subcategorization and syntactic categories; only four categories had scores below seventy percent. The percentages for the subcategorization categories were on the whole higher than those for the syntactic categories, indicating that the "mechanics" of complementation is perhaps more difficult than the "selection" process.

4.1.1.2. Sequential Relationships

The sequential relationships, based upon the ordering-theoretic method developed by Dart and Krus, are presented in Table 5. Those percentages which indicate a prerequisite relationship have been circled. A tolerance level of five percent was allowed for performance errors.

With regard to the relationships among the subcategorization categories, it can be seen from the matrix in Table 5 that three structures are prerequisities to the other ten items; this is because all of the subjects got scores of 100 percent correct on the three categories. The three prerequisite categories were *Infin-END*, *Infin-END/Gerund*, and *Infin-NP/Gerund*. *Infin-NP* is a prerequisite to three structures: *Poss-ing/That*, *Gerund/That*, and *Infin-NP/That*. *Prep+Poss-ing* is prerequisite to *Poss-ing/That*, *Gerund/That*, and *Infin-NP/That*; *Poss-ing* is prerequisite to *Gerund/That* and *Infin-NP/That*. *Prep+Gerund*, *Gerund* and *That* are prerequisites to *Gerund/That* and *Infin-NP/That*. Except for *Infin-END/That* and *Gerund/That*, all items are prerequisites to *Infin-NP/That*. These relationships are presented in "tree" form in Figure 7.

Figure 8 illustrates the prerequisites among these nineteen categories more clearly. Here the structures have been placed in groups, the first group being the prerequisite to the second and the second group a prerequisite to the success of the third. Thus, success on the items in the first group precedes success on those items in the second group; the items in Group II precede those in Group III. Within a group there is no ordering of the items. It is interesting to note that with certain structures the presence of an *NP* has an effect on the difficulty of an item. With respect to verbs requiring the infinitive form only, those with *NP*'s are more difficult than their *END* counterparts (ie., *Infin-END* structures are prerequisities to *Infin-NP* structures). This "*NP* after *END*" relationship holds also for *Infin/That* verbs. There

TABLE 5. MATRIX OF DISCONFORMITY RESPONSES

	Infin-END	Infin-END/Gerund	Infin-NP/Gerund	Infin-NP	Prep+Poss-ing	Poss-ing	Prep+Gerund	Gerund	That	Infin-END/That	To Be Deletion	For-To	Poss-ing/That	Possessive	To Deletion	Gerund/That	Infin-NP/That	Tense Sequencing	Raising
Infin-END	—	0.0	0.0	11.6	14.0	16.3	16.3	23.3	27.9	23.3	34.9	48.8	48.8	72.1	69.8	79.1	74.4	97.7	97.7
Infin-END/Gerund	0.0	—	0.0	11.6	14.0	16.3	16.3	23.3	27.9	23.3	34.9	48.8	48.8	72.1	69.8	79.1	74.4	97.7	97.7
Infin-NP/Gerund	0.0	0.0	—	11.6	14.0	16.3	16.3	23.3	27.9	23.3	34.9	48.8	48.8	72.1	69.8	79.1	74.4	97.7	97.7
Infin-NP	11.6	11.6	11.6	—	11.6	9.3	9.3	7.0	11.6	14.0	30.2	46.5	44.2	60.5	60.5	67.4	62.8	86.0	86.0
Prep+Poss-ing	14.0	14.0	14.0	11.6	—	16.3	16.3	20.9	23.3	20.9	34.9	41.9	39.5	60.5	58.1	65.1	65.1	93.7	93.7
Poss-ing	16.3	16.3	16.3	14.0	16.3	—	16.3	20.9	18.6	20.9	20.9	34.9	30.2	51.2	58.1	58.1	58.1	93.7	93.7
Prep+Gerund	16.3	16.3	16.3	14.0	16.3	16.3	—	20.9	18.6	20.9	20.9	34.9	30.2	51.2	58.1	58.1	58.1	93.7	93.7
Gerund	23.3	23.3	23.3	18.6	23.3	20.9	20.9	—	20.9	18.6	20.9	34.9	30.2	51.2	58.1	58.1	58.1	93.7	93.7
That	27.9	27.9	27.9	23.3	23.3	20.9	18.6	20.9	—	11.6	27.9	37.2	32.6	44.2	51.2	51.2	44.2	74.4	74.4
Infin-END/That	23.3	23.3	23.3	18.6	20.9	18.6	20.9	20.9	14.0	—	11.6	14.0	9.3	23.3	32.6	30.2	34.9	67.4	67.4
To Be Deletion	34.9	34.9	34.9	30.2	34.9	30.2	30.2	27.9	—	23.3	20.9	7.0	32.5	7.0	48.8	23.3	30.2	74.4	74.4
For-To	48.8	48.8	48.8	44.2	46.5	41.9	39.5	34.9	37.2	32.6	—	23.3	16.3	11.6	14.0	9.3	11.6	58.1	58.1
Poss-ing/That	48.8	48.8	48.8	44.2	46.5	41.9	39.5	34.9	30.2	34.9	30.2	23.3	—	16.3	9.3	11.6	4.7	48.8	48.8
Possessive	72.1	72.1	72.1	60.5	60.5	58.1	55.8	51.2	58.1	39.5	39.5	39.5	39.5	—	25.6	16.3	14.0	25.6	25.6
To Deletion	69.8	69.8	69.8	62.8	60.5	58.1	60.5	51.2	44.2	51.2	23.3	32.6	30.2	23.3	—	14.0	11.6	0.0	0.0
Gerund/That	79.1	79.1	79.1	69.8	65.1	67.4	65.1	58.1	51.2	58.1	34.9	62.8	41.9	23.3	23.3	—	23.3	6.0	6.0
Infin-NP/That	74.4	74.4	74.4	62.8	65.1	60.5	55.8	53.5	44.2	58.1	14.0	34.9	30.2	16.3	18.6	—	16.3	18.6	23.3
Tense Sequencing	97.7	97.7	97.7	86.0	93.7	81.4	81.4	74.4	67.4	74.4	58.1	48.8	48.8	25.6	28.0	18.6	23.3	—	2.3
Raising	97.7	97.7	97.7	86.0	86.0	93.7	93.7	74.7	69.8	74.7	60.5	51.7	51.2	22.9	20.2	20.9	25.6	2.3	—

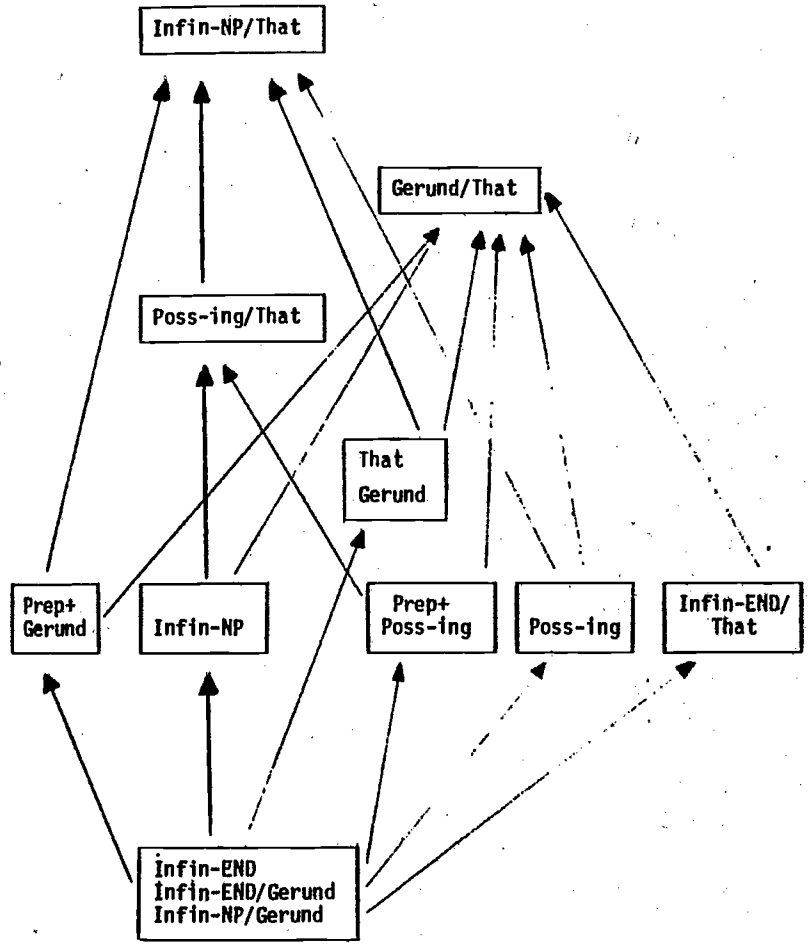


Fig. 7. Hierarchy of Difficulty for Subcategorization Categories.

was no sequential relationship found between *Infin-END/Gerund* and *Infin-NP/Gerund* verbs, both environments of this type of verb having received perfect scores on the tests by all subjects. With regard to *Poss-ing* and *Gerund* structures, there is no sequential relationship. This holds true also for *Prep+Poss-ing* and *Prep+Gerund* verbs and for *Poss-ing/That* verbs. Thus, for *Poss-ing* and *Gerund* verbs, along with their alternative use with other complements, there is no sequential relationship between the *NP* and *END* environments but for the *Infin-NP* and *Infin-END* there was an ordering relationship.

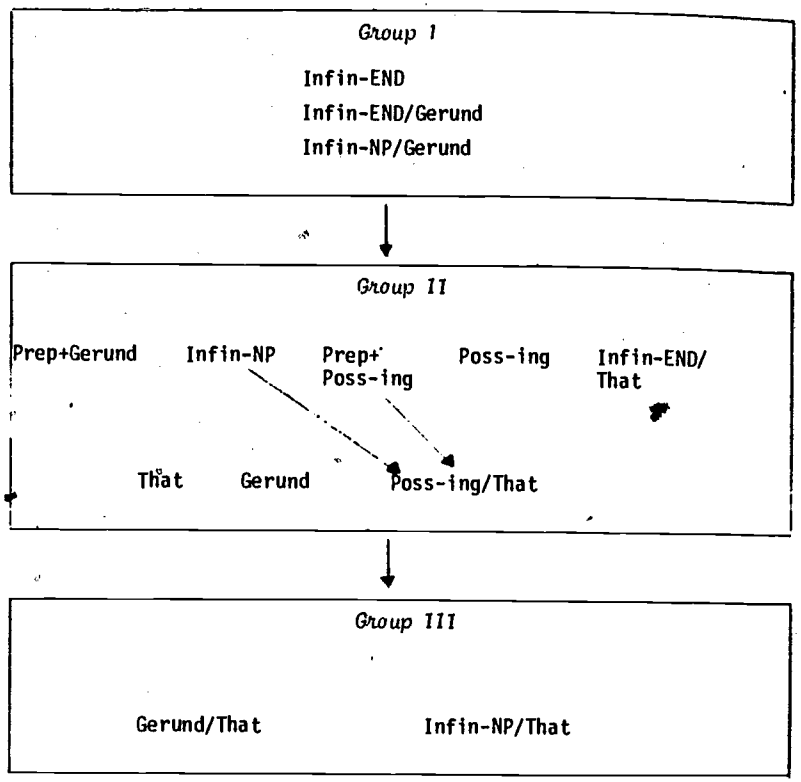


Fig. 8. Difficulty Tree for Subcategorization Categories.

With regard to the syntactic categories, it can be seen from the matrix in Table 5 that of the six items, *To-Deletion*, *To Be-Deletion*, *Possessive*, and *For-To* were prerequisites to *Tense Sequencing* and *Raising*, as shown in Figure 9. Figure 10 illustrates group memberships, with the four items in Group I being easier than the two items in Group II.

Finally, in Figure 11 we see the relationships among all the categories, subcategorization and syntactic combined. In most instances, it is the subcategorization category which is the prerequisite to the syntactic category: *Infin-NP* with all of the six syntactic categories except *For-To*; *Prep+Poss-ing* and *Poss-ing*, with *Possessive*, *To-Deletion*, *Tence Sequencing*, and *Raising*; *Gerund* and *That* with *To-Deletion*, *Tense Sequencing* and *Raising*; *Prep+Gerund* with *To-Deletion*, *Tense Sequencing*, and *Raising*. All the other subcategorization cate-

gories are prerequisite to *Tense Sequencing* and *Raising*, which are the most difficult of all the categories combined. The syntactic aspects of complementation seem to be more difficult than the subcategorization rules.

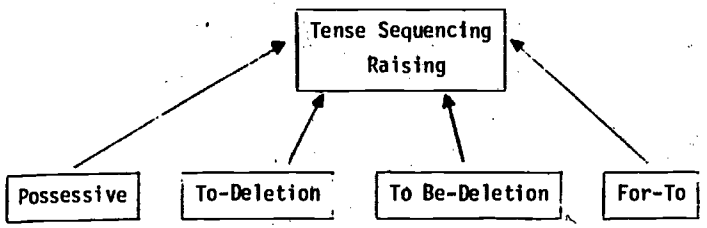


Fig. 9. Hierarchy of Difficulty for Syntactic Categories.

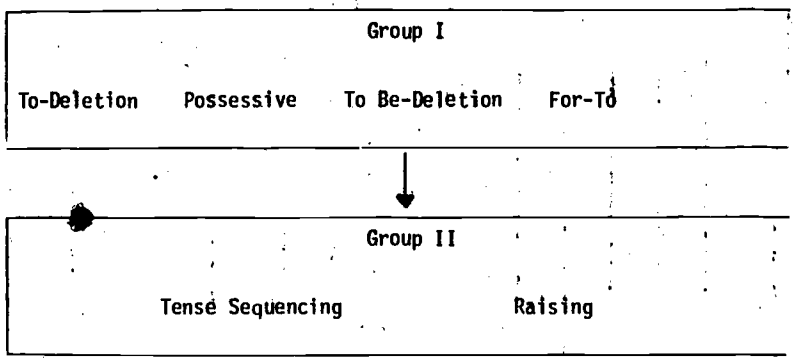


Fig. 10. Difficulty Tree for Syntactic Categories.

A comparison between the ordering derived for the Finnish speakers and the ordering compiled by Anderson (1976) for Spanish speakers can be made by examining Figures 12 and 13. There were six subcategorization categories in common for both studies: *That*, *Infin-END*, *Infin-NP*, *Gerund*, *Poss-ing*, and *Prep+Gerund*. In Figure 12, the orderings found in each study are given.

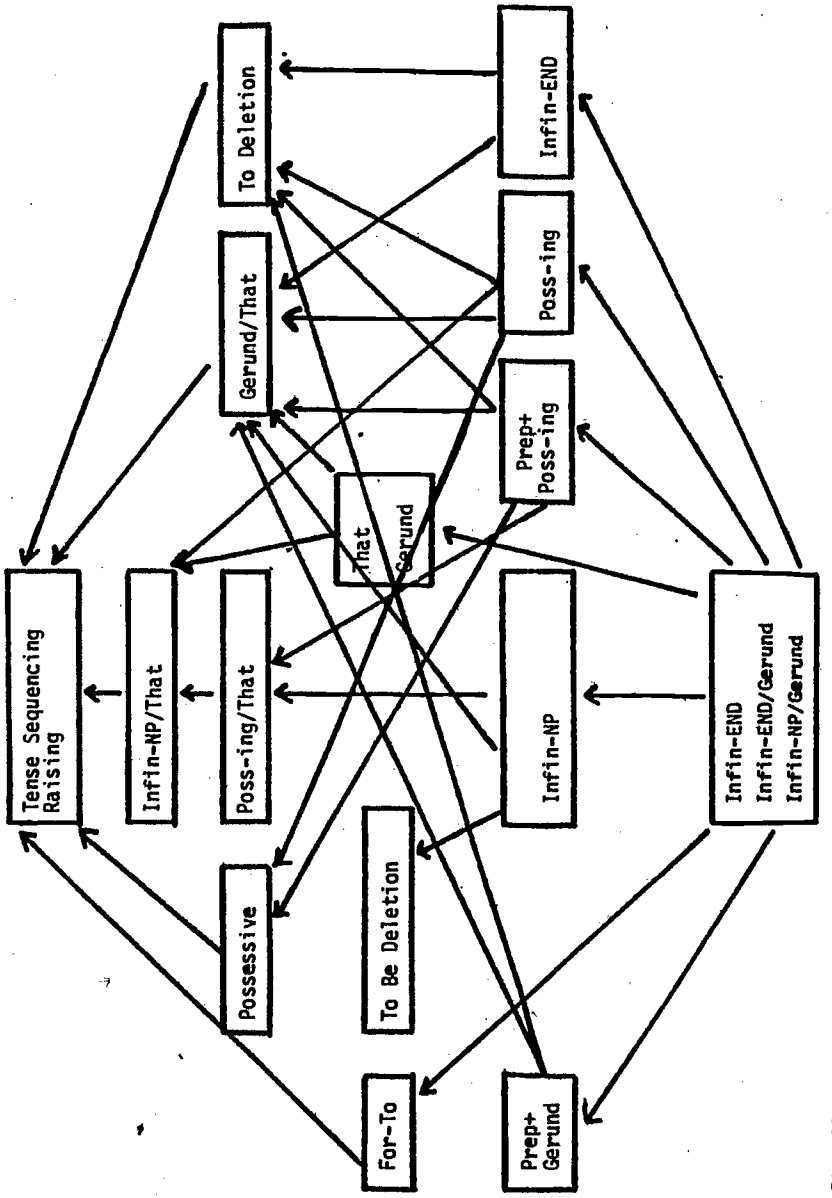


Fig. 11. Hierarchy of Difficulty for Subcategorization and Syntactic Categories Combined

Present Study

Categories (x) / (y)	That	Infin-END	Infin-NP	Gerund	Poss-ing	Prep+ Gerund
That	---	+	o	o	o	o
Infin-END		---	-	-	-	-
Infin-NP			---	o	o	o
Gerund				---	o	o
Poss-ing					---	o
Prep+ Gerund						---

Key: +: Category x before category *y*
-: Category *y* before category x
o: No ordering between category x and category *y*

Anderson (1976)

Categories (x) / (y)	That	Infin-END	Infin-NP	Gerund	Poss-ing	Prep+ Gerund
That	---	+	+	+	-	o
Infin-END		---	-	-	-	-
Infin-NP			---	-	-	-
Gerund				---	-	-
Poss-ing					---	-
Prep+ Gerund						---

Key: +: Category x before category *y*
-: Category *y* before category x
o: No ordering between category x and category *y*

Fig. 12. The ordering for present study and Anderson (1976).

A contingency table, showing agreement between the present study and Anderson on the ordering of the six subcategorization categories in common, is given in Figure 13. The numbers in the table indicate the number of cases for each arrangement.

Present Study

Anderson (1976) Orderings	+	-	o
+	1	o	2
-	o	4	7
o	o	o	1

Key: +: Category x before category *y*
-: Category *y* before category x
o: No ordering between category x and category *y*

Fig. 13. Contingency Table

As can be seen from Figure 13, there were six cases where the ordering in the present study agrees with the Anderson ordering; there was one case in which x came before *y* (*Infin-END*) before *That* , four cases in which *y* came before x (*Infin-END*) before *Infin-NP*, *Gerund*, *Poss-ing*, and *Prep+Gerund*), and one case in which there was no ordering (*That* and *Prep+Gerund*). There were nine cases where Anderson had an ordering but such an ordering was not evident in the present study: *Gerund* before *That*, *Poss-ing* and *Prep+Gerund* but after *Infin-NP*; *Poss-ing* before *Prep+Gerund* and after *That* and *Infin-NP*; and *Infin-NP* before *That* and *Prep+Gerund*.

In summary, the Bart and Krus ordering-theoretic method yielded several prerequisite relationships. *Infin-END*, *Infin-END/Gerund*, and *Infin-NP/Gerund* were prerequisites to all of the other categories and all of the other categories were prerequisites to *Tense Sequencing* and *Raising*. There were fewer prerequisite relationships in the present study, however, than in the Anderson (1976) study on sentential complementation.

4.1.1.3. Correlations in Rankings

In this section, two analyses are made. The first analysis concerns correlation between the group ranking and the individual rankings. The second analysis attempts to determine whether or not the individual rankings are significantly correlated.

Table 6 presents the results of the first analysis--the comparison of individual cross-sectional rankings with the cross-sectional ranking determined by the group mean scores.

TABLE 6

SPEARMAN RANK COEFFICIENTS: CROSS-SECTIONAL GROUP RANKING AND INDIVIDUAL CROSS-SECTIONAL RANKINGS

Subject 1	-.23	Subject 11	.99*
Subject 2	.93*	Subject 12	.50
Subject 3	.94*	Subject 13	-.04
Subject 4	.76	Subject 14	.13
Subject 5	.10	Subject 15	.64
Subject 6	.81	Subject 16	.66
Subject 7	.64	Subject 17	-.10
Subject 8	.33	Subject 18	.76
Subject 9	.26	Subject 19	.60
Subject 10	.26	Subject 20	.43
		Subject 21	.54

*p <.01

Out of twenty-one subjects examined, only three had rankings which were significantly correlated with the group-derived ranking. This would seem to indicate that individual rankings are being misrepresented by rankings based on group data.

In Table 7 are the results of the second analysis. Whereas in the first analysis individual rankings were compared with the group ranking, in this analysis the individual rankings are compared with each other in order to determine if they are significantly correlated. The significant correlations have been circled. The rankings correlated only 14 percent of the time (ie., in the only thirty out of 210 cases were the correlations for the rankings significant). This is an indication that there is a great deal of variation among the subjects. Such results verify the findings in the Rosansky (1976) study. Rosansky found that when she compared the individual subjects' rankings, they did not correlate significantly.

4.1.1.4 Environments

In this section the influence of the environment on the type of

TABLE 7

SPEARMEN RANK COEFFICIENTS: INDIVIDUAL CROSS-SECTIONAL RANKINGS

Subjects	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	—																				
2	-.34	—																			
3	-.40	.99	—																		
4	-.61	.86	.90	—																	
5	.35	-.04	.01	-.25	—																
6	-.67	.94	.96	.94	-.17	—															
7	.04	.47	.50	.24	.63	.36	—														
8	-.09	.26	.27	.04	.54	.74	.04	—													
9	-.20	.71	.43	-.64	-.21	.41	-.30	.19	—												
10	[illegible]	.37	.40	.19	.56	.33	.16	.99	.29	—											
11	-.40	.99	1.00	.90	.01	.96	.50	.27	.43	.40	—										
12	.19	.83	.56	.51	-.37	.51	.06	-.09	.36	-.07	.56	—									
13	-.09	.09	.16	.20	.29	.11	-.29	.76	.70	.74	.16	-.09	—								
14	-.09	.26	.27	.04	.54	.19	.04	1.00	.19	.99	.27	-.09	.76	—							
15	-.50	.86	.90	.96	-.19	.90	.14	.27	.76	.37	.90	.51	.41	.26	—						
16	-.68	.76	.77	.67	.19	.84	.50	.44	.09	.57	.77	.10	.16	.44	.61	—					
17	.03	.50	.54	.56	.07	.42	-.13	.56	.89	.57	.54	.39	.81	.56	.73	.20	—				
18	-.46	.76	.71	.56	.04	.79	.39	.39	-.09	.49	.71	.39	.41	.39	.50	.94	-.28	—			
19	-.04	.44	.50	.42	.26	.39	.83	-.41	-.01	-.27	.50	.17	-.40	-.41	.29	.16	-.53	.13	—		
20	-.23	.84	.86	.67	-.41	.73	-.04	.21	.43	.26	.77	.84	.16	.21	.73	.43	.57	.60	-.04	—	
21	-.17	.06	.10	-.01	.54	.07	-.07	.94	.24	.96	.10	-.26	.84	.94	.51	.39	.50	.27	-.47	-.01	—

complement used will be investigated. For the subcategorization categories, the investigation includes (1) complement choice when two types of complements are permissible, (2) evidence of transference, and (3) types of errors in complement selection. For the syntactic categories, an analysis was made to determine if the particular verb used had an effect on the correct application of the rule.

The first part of this section discusses the investigation into complement choice: given instances where two types of complements are permissible with a verb, will one complment be favored over another? Table 8 gives the figures for Infinitival/Clausal-complement verbs, Clausal/Gerundive-complement verbs, and for Infinitival/Gerundive-complement verbs. As it can be seen, the infinitival complement is favored over the clausal complement almost three to one with Infinitival/Clausal-complement verbs. With Clausal/Gerundive-complement verbs, the gerundive was preferred slightly over the clausal complement. With Infinitival/Gerundive-complement verbs, neither complement type was preferred over to other. Thus, only with the first type of verbs was there a definite preference of one type of complement over another.

TABLE 8

COMPLEMENT PREFERENCE, PERCENTAGES OF RESPONSES SELECTING DIFFERENT COMPLEMENTS

Infinitival/Clausal-Complement Verbs

Infinitival	*Clausal*
68.8	21.9
Errors	*No Response*
3.0	6.3

Clausal/Gerundive-Complement Verbs

Gerundive	*Clausal*
36.1	22.9
Errors	*No Response*
32.9	8.1

Infinitival/Gerundive-Complement Verbs

Infinitival	*Gerundive*
67.5	28.5
Errors	*No Response*
0.0	4.0

Looking at a breakdown of the complement verb types, certain tendencies can be found. For the Infinitival/Clausal-complement verbs, an examination revealed that, although the individual verb was not a determining factor in selecting one complement over another. environment (ie., *NP* or *END*) did influence the choice of the complement used, as illustrated in Table 9.

TABLE 9

INFINITIVAL/CLAUSAL-COMPLEMENT VERBS
ENVIRONMENT INFLUENCE PERCENTAGES
OF RESPONSES

Environment	*Infinitival*	*Complement Clausal*	*Choice Errors*	*No response*
NP	51.9	41.1	2.3	4.7
END	81.4	7.6	3.5	7.5

Although the infinitival complement is favored in both environments, its preference with *END* environments was substantially higher than with *NP* environments. Especially noticeable was the influence of the environment on the verb *promise* (Table 10).

TABLE 10

COMPLEMENT PREFERENCE FOR *PROMISE*
ENVIRONMENT INFLUENCE PERCENTAGES
OF RESPONSES

Environment	*Infinitival*	*Complement Clausal*	*Choice Errors*	*No Response*
Environments Combined:	61.6	32.6	0.0	5.8
For Each Environment				
NP	27.9	60.5	0.0	11.6
END	95.3	4.7	0.0	0.0

As evident from the top part of Table 10, the infinitive was favored over *that*-clauses with *promise* when both environments were combined. However, a breakdown according to environment reveals that for *promise*, the clausal complement was favored in NP environments while with *END*

environments, the infinitive was almost exclusively used. For the *NP* and *END* environments with other *Infinitival/Clausal*-complement infinitive was the preference in both environments. One explanation for this phenomenon with *promise* is transference: the *NP*-environment test item of *promise* was a translation item with a *that*-clause in the stimulus sentence. The effect of transference will be discussed in detail later.

With Clausal/Gerundive-complement verbs, a breakdown according to environment revealed that environment was not a major decisive factor. There was a slight preference of the gerundive over clausal complements in both environments. The breakdown is found in Table 11.

TABLE 11

GERUNDIVE/CLAUSAL-COMPLEMENT VERBS
ENVIRONMENT INFLUENCE PERCENTAGES
OF RESPONSES

Environment	*Gerundive*	*Complement Choice Clausal*	*Errors*	*No Responses*
NP	41.9	32.5	20.9	4.7
END	34.9	20.9	35.4	8.8

Although environment did not play a decisive role for either environment here, the individual verb did influence the selection of one complement-type over another, as shown when comparing two verbs with the same environment. Table 12 provides complement preference for the *END* environment of *admit* and *deny*.

TABLE 12

ADMIT AND *DENY* (AND ENVIRONMENT) COMPLEMENT
PREFERENCE PERCENTAGES OF RESPONSES

Verb	*Gerundive*	*Complement Choice Clausal*	*Errors*	*No Response*
Admit	26.4	27.9	34.1	11.6
Deny	47.7	10.5	37.2	4.6

Although for *admit* the selection of the two possible types was random, for *deny* the gerundive was preferred over a *that*-clause. Thus, for the two Clausal/Gerundive-complement verbs used in this study, the prefe-

rence of one complement type over another in the same environment was influenced by the verb involved. Unfortunately for these two verbs there were no examples in the *NP* environment to compare with.

From a breakdown of the Infinitival/Gerundive-complement verbs into the individual verbs, it can be seen that for *like*, the choice of complement-type was random. For *hear* and *see*, however, the infinitive was favored over the gerundive. Thus, for perception verbs like *hear* and *see* in a *NP* environment, one complement type is preferred over another while for a verb like *like* in the *END* environment, there is no complement-type preference.

TABLE 13

INFINITIVAL/GERUNDIVE-COMPLEMENT VERBS COMPLEMENT PREFERENCE, PERCENTAGES OF RESPONSES

Verb	*Environment*	*Complement Choice* *Infinitival*	*Gerundive*	*Errors*	*No Response*
Hear	NP	69.8	22.1	0.0	8.1
See	NP	79.1	20.9	0.0	0.0
Like	END	51.1	48.9	0.0	0.0

In summary, complement choice seemed to be governed by several things, depending upon the verb or the type of verb involve. For Infinitival/Clausal-complement verbs, environment (ie., *NP* or *END*) was a decisive factor. The infinitive seemed to be preferred with *END* environments. With Gerundive/Clausal-complement verbs and Infinitival/Gerundive-complement verbs, it was not the environment but the specific verb which influenced the complement choice. Unfortunately, though, there were no examples of both environments for all of the verbs examined.

From the discussion of complement choice, the question about the role of transference arises. Transference is defined here as the influence of the stimulus sentence on the response. For instance, with *promise* it was found that a clausal complement was favored over the infinitival complement whereas with other verbs in object positions the infinitive was preferred. Transference is a possible explanation for the preference of the clausal complement with *promise* in the *NP* environment because the Finnish stimulus sentence contained an *että*-clause (equivalent to a *that*-clause in English). The word for *promise*

in Finnish is *luvata* and requires an *että*-clause in the NP environment. Because Finnish requires an *että*-clause in the stimulus, the preference of a *that*-clause in English may be a result of this. A further investigation was done to see if complement-type of the Finnish stimulus sentence influenced complement choice. Two verbs were examined: *admit* and *hear*. Both verbs were represented by test items which consisted of a translation item and a non-translation item. The stimulus in the translation item was in the participial form for both verbs. In Finnish, the two verbs can take either a clausal or participial complement. Table 14 presents the percentages for the complement preferences.

TABLE 14

COMPARISON OF TRANSLATION AND NON-TRANSLATION ITEMS, PERCENTAGES OF RESPONSES

ADMIT

Type of Complement Given by Student	*Translation Task Item I.7*	*Non-Translation Task Item IV.10*
Gerundive	14.0	41.9
Clausal	37.2	27.9
Infinitive (Error)	25.6	25.6
No Response	23.2	4.6

HEAR

Type of Complement Given by Student	*Translation Task Item I.12*	*Non-Translation Task Item II.9*
Infinitive	65.1	74.4
Gerundive	18.6	25.6
Clausal (Error)	0.0	0.0
No Response	16.3	0.0

From Table 14 it is evident that transference was not a factor in the responses given for *admit* and *hear*. In fact, with *admit* the gerundive complement was preferred more with the non-translation item than with the translation item with the gerundive-complement stimulus. With *hear*, the gerund was preferred with both the translation and non-translation items. Although the results of this analysis seem to indicate that transference was not a factor in the responses, the results are

nonetheless inconclusive because of the limited number of items examined. More than two items need to be examined in order to determine the role of transference in using a complement. In order to adequately determine the role of transference, additional testing must be done. A real test of the role of transference would involve Finnish verbs which allow two types of complementizers in Finnish and with its English equivalent. The translation task would thus include Finnish sentences where both types of complements were used. If transference were at work here, it would be expected that the choice of complement in English would mirror the stimulus complement given in Finnish.

In the first part of this section an analysis was made to see if the environment had an effect on the complement chosen when two complements are permissible. Another consideration is the effect environment has on the errors made in selecting a complement. This investigation was made in order to determine if, given that a mistake is made, one complement will be favored over another. An analysis of the data reveals an overgeneralization of the infinitive, as evident in Table 15.

TABLE 15

COMPLEMENT-SELECTION ERRORS
PERCENTAGES OF RESPONSES

Clausal-Complement Only Verbs

Infinitive	*Gerundive*
17.9	5.0

Gerundive-Complement Only Verbs

Infinitive	*Clausal*
4.5	0.6

Infinitive-Complement Only Verbs

Gerundive	*Clausal*
0.003	0.013

In instances where an incorrect choice is made with verbs which allow only the clausal complement, the infinitive complement was favored over the gerundive complement; the infinitival clauses composed 17.9 percent of the total responses, while the gerundive was only five percent of the total. This overgeneralization of the infinitive was also found with verbs which allow only the gerundive complement, even

though the percentages on the whole were lower (due to a lower error rate). The wrong use of the infinitival complement comprises 4.5 percent of the total responses while use of the clausal complement totaled less than one percent. These findings coincide with the preference of the infinitive with Infinitival/Clausal- and Infinitival/Gerundive-complement verbs. In instances where the verbs allowed only an infinitival complement, there did not seem to be a preference of one complement over another but so few errors were made that the figures are inconclusive.

Of particular interest were the errors made with two *Infin-NP/That* verbs: *decide* and *hope*. For these two verbs, these are restrictions with complement choice when an *NP* is present. For whereas in *END* environments both the infinitival and clausal complements are allowed, with *NP* environments only the clausal complement is permissible:

Infin-NP/That Verbs:
DECIDE and HOPE

Verb	*Environment*	*Complement*	*Example*
Decide	NP	Clausal	John decided that Bill would have to leave early.
		*Infinitive	*John decided Bill to leave early.
	END	Clausal	John decided that he would go to Chicago
		Infinitive	John decided to go to Chicago
Hope	NP	Clausal	Mary hopes that John will buy a new car.
		*Infinitive	*Mary hopes John to buy a new car.
	END	Clausal	Bill hopes that he will play baseball.
		Infinitive	Bill hopes to play baseball.

*Indicates ungrammatical sentence.

Table 16 provides the percentages of wrong responses for the *NP* and *END* environments of each of these verbs:

TABLE 16

INFIN/THAT-COMPLEMENT VERBS: *DECIDE* AND *HOPE*
PERCENTAGES OF WRONG RESPONSES

	ENVIRONMENT	
Verb	*END* (Both Clausal and Infinitival Complements Allowed)	*NP* (Only Clausal Complements Allowed)
Decide	0.0	20.9
Hope	3.5	23.3

As evident from Table 16, the *NP* environment (ie., the environment which allows only clausal complements) accounted for the errors within these two verbs. Moreover, these verbs had higher percentages of error than verbs without this restriction, as shown in Table 17.

TABLE 17

INFIN/THAT-COMPLEMENT VERBS, *NP* ENVIRONMENT
PERCENTAGES OF WRONG RESPONSES

No Restriction in NP Environment		*Restriction in NP Environment*	
Expect	2.3	Decide	20.9
Promise	0.0	Hope	23.3

Both *expect* and *promise* allow the use of infinitive and clausal complements in both environments, while *decide* and *hope* have the restriction. If the errors with the restricted verbs were the result of not having learned this restriction then the errors made should be composed mainly of infinitival complements. In other words, students would not have learned a categorical rule for the *NP* environment (ie., a rule which states that only one type of complement is permissible) but instead would be using a variable rule which allows both variants, which in this case would be both the infinitival and clausal complements. Figure 14 shows the stages that a language learner might go through in learning this *NP*-environment restriction for verbs like *decide* and *hope*. Stage 1 represents not being aware of the restriction in the *NP*-environment while Stage 2 represents having learned this restriction.

STAGE 1

Variable Rule

Complement → {Infinitival / Clausal} / V ___ {NP / END}
Infinitival/ Clausal

STAGE 2

Variable Rule

Complement → {Infinitival / Clausal} / V ___ {NP / END}
Infinitival/ Clausal: all verbs except *decide* and *hope*

Categorical Rule

Complement → Infinitival / V ___ NP
Infinitival/ Clausal: *decide*, *hope*

Fig. 14. Hypothesized Stages

Table 18 presents a breakdown of the complements used with *decide* and *hope* to see if the use of the infinitive in the *NP*-environment was responsible for the errors.

TABLE 18

INFIN/THAT-COMPLEMENT VERBS: *DECIDE* AND *HOPE*
COMPLEMENT ERROR BREAKDOWN FOR NP-ENVIRONMENT
PERCENTAGES OF WRONG RESPONSES

	Complement Choice	
Verb	*Infinitival*	*Gerundive*
Decide	11.6	9.3
Hope	23.2	0.0

As can be seen, for *hope* the errors were exclusively infinitival, indicating that selection of a complement for *NP* environments is a variable one, with the option of selecting either an infinitival or clausal complement. This did not seem to be the case for *decide*, where almost half of the wrong responses were composed of gerundive complements. One explanation is that for *hope* a variable rule is at work while for *decide* it is simply a case of not knowing which complement to use, although all of the errors do occur with the *NP* environment.

In conclusion, it does seem as though environment influences not only the selection of a correct complement but also the selection of an incorrect complement. There was an overgeneralization of the infinitive found. In addition, the restriction on complement selection by certain verbs, such as *decide* and *hope*, tends to be learned late but the question of whether it is because the language learner is using a variable rule instead of a categorical rule warrants furhter investigation.

As with the subcategorization categories, an analysis was made to determine what effect the particular verbs had on the responses for the syntactic categories. In other words, given a specific syntactic category, do subjects apply a rule frequently with one verb but not with another?

For *To-Deletion*, an examination of Table 19 shows that the verb with the highest percentage of incorrect responses was *should have* (eg., Item V.13: John should have Mary *bake* some bread).

TABLE 19

TO-DELETION PERCENTAGES OF RESPONSES

	Type of Response		
Verb	*Correct Response*	*Incorrect Response*	*No/Other Response*
let	98.8	1.2	0.0
hear	76.7	0.0	23.3
see	88.4	3.5	8.1
make	94.2	5.8	0.0
should have	39.5	60.5	0.0

For the use of the possessive with *NP* gerundive complements, shown in Table 20, no one particular verb was responsible for the percentage of incorrect responses for that category, although both *think about*, and *forget about* had a fair number of incorrect responses given. *To be delighted at* had the highest percentage of correct responses. One explanation for this might lie in the fact that the *NP* to be put in the possessive form was a pronoun whereas in the other instance a proper noun was used (eg., "I was delighted at *his* coming." vs. "I resented *Bill's* winning the prize.")

TABLE 20

POSSESSIVE PERCENTAGES OF RESPONSES

	Type of Response		
Verb	*Correct Response*	*Incorrect Response*	*No/Other Response*
resent	20.9	18.6	60.5
enjoy	72.1	20.9	7.0
prevent	4.7	0.0	95.3
to be delighted at	88.4	7.0	4.6
think about	51.2	39.5	9.3
forget about	60.5	30.2	9.3
to be good	48.8	4.7	46.5
regret	76.7	14.0	9.3

With regard to tense sequencing, the verbs which caused the greatest difficulty were *suggest*, *recommend*, and *insist*. Of the verbs used in the test, these were the ones that required the use of the subjunctive.

From the examination of the six syntactic categories and their different environments, it does appear that certain environments caused more difficulty than others. For *Tense Sequencing*, the verbs which required the subjunctive were more difficult while for the *Possessive* difficulty was dependent upon or not the possessive was added to a noun or a pronoun. For *To-Deletion*, "should have" proved to be the most difficult environment. A possible explanation for this might be the frequency that "should have" appears in texts. It does not seem to be as common as the other verbs used.

4.1.2 Longitudinal Data

This section investigates the development over time in the acquisition of English sentential complementation by twenty-one of the forty-three adult Finnish speakers. First, an investigation into the correct use of the subcategorization and syntactic categories across time is made; then the improvement over time for the individual verbs is examined. Finally, the degree of variability for individual subjects is determined.

4.1.2.1 Analysis of Variance

An analysis of variance was done in order to see if there were any subcategorization or syntactic categories which students improved on

TABLE 21

TENSE SEQUENCING PERCENTAGES OF RESPONSES

Verb	Type of Response: Correct Response	Incorrect Response	No/Other Response
expect	9.0	11.0	73.0
promise	30.0	1.0	69.0
plan	7.0	0.0	93.0
decide	51.0	1.0	48.0
hope	18.0	5.0	77.0
think	68.0	8.0	24.0
notice	24.0	1.0	75.0
resent	28.0	5.0	67.0
admit	28.0	1.0	71.0
deny	5.0	3.0	92.0
demand	30.0	0.0	70.0
suggest	21.0	56.0	23.0
recommend	42.0	58.0	0.0
insist	65.0	35.0	0.0

significantly over the test period. The mean scores for each of the subcategorization and syntactic categories on all three tests for the twenty-one subjects are found in Figures 15 and 16. As can be seen, most of the means for the subcategorization categories were high on the first testing and remained so through the second and third testings. Exceptions are *Poss-ing/That* and *Gerund/That* structures, which had relatively lower scores than the other subcategorization categories. Of these two categories, only *Gerund/That* showed much improvement over time; such improvement was significant at the .07 level. Means for the syntactic categories were lower than for the subcategorization categories, with no categories undergoing significant improvement over time.

Besides grouping the verbs into their appropriate classes, an analysis of variance for the three testings was computed for the individual verbs in order to determine if certain verbs changed significantly over time. The data indicating improvement over time for each verb are given in Figure 17. Four verbs changed significantly over time. *Demand* dropped significantly ($p < .05$) on the second testing

while *expect* dropped on the third testing ($p < .05$). *Finish* improved over all three testings ($p < .05$) while *deny* showed the greatest improvement between the first and second testing ($p < .01$).

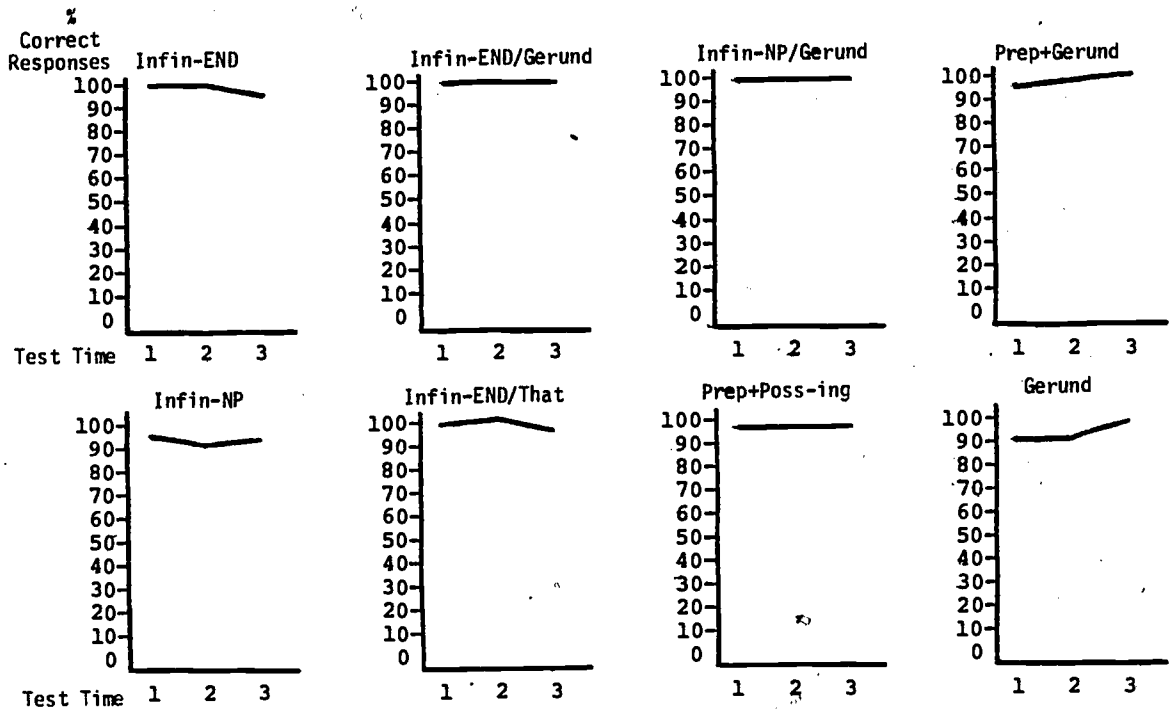
Thus, for both the subcategorization and syntactic categories and for most of the individual verbs there was little change over time. This was probably due to the fact that most of these categories had already been learned, as evident in the high percentage of correct items on all three testings.

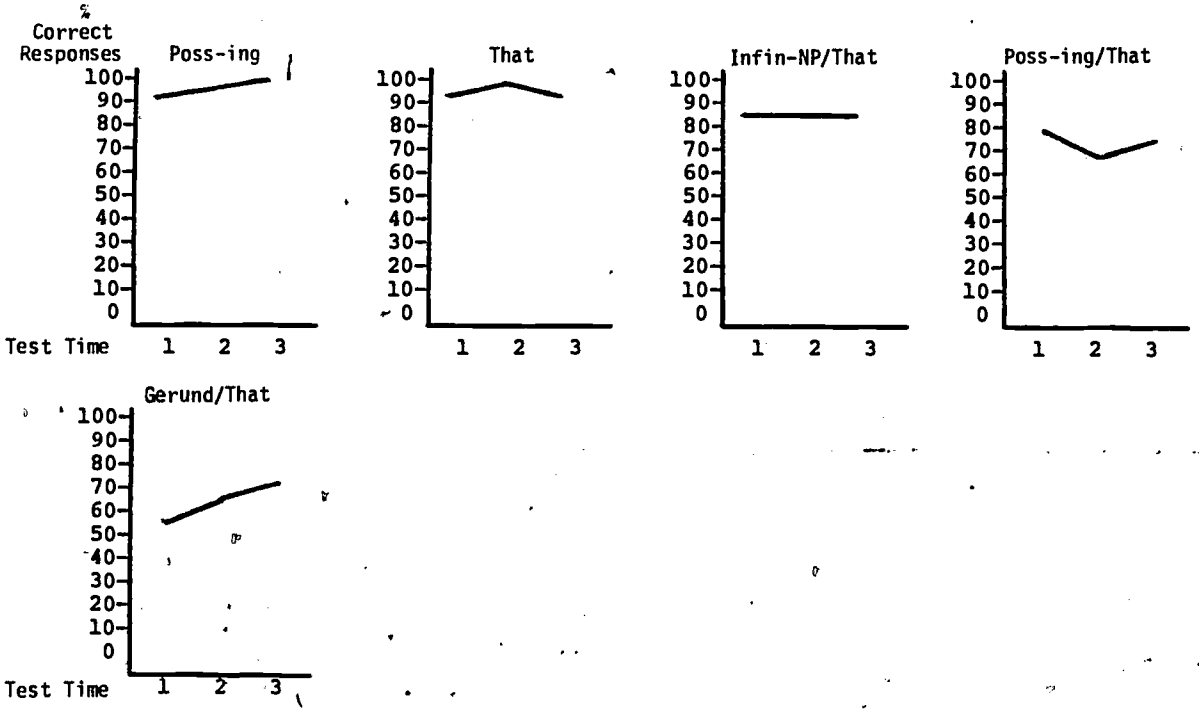
4.1.2.2 Correlations Among Categories For Each Testing

Besides an analysis of variance, a correlation of coefficients was done on the nineteen subcategorization and syntactic categories to determine if fluctuation in the scores for certain categories corresponded with the fluctuation in scores of other categories. Thus, the analysis is looking for instances in which students who drop down or raise on one testing for two categories also drop down or raise on these categories during another testing. If such a correlation existed, that would be evidence that certain verbs are being acquired together. The correlation coefficients were done for all the test categories for each test time. If correlations exist between two categories on all three tests, this indicates that the two categories are related.

On the first testing (see Table 22) we find a significant correlation between *That* and *Gerund/That; Poss-ing* and *Prep+Poss-ing; Infin-NP/That* with *Gerund/That;* and *Infin-END/That* with *Gerund/That* and *For-To;* and *Infin-NP* with *Possessive, Infin-NP/That* and *Raising*. On the second testing (see Table 23), the correlations change. Here, *That* correlates significantly with *Infin-NP/That, Gerund/That,* and *Tense Sequencing; Poss-ing* with *Gerund, Prep+Gerund, For-To* and negatively with *Raising; Gerund* with *Prep+Gerund* and *To-Deletion; Prep+Gerund* with *To-Deletion* and *For-To; Poss-ing/That* with *To-Deletion;* and *Tense Sequencing* with *Raising*. On the third test (see Table 24) there are correlations between *That* and *Infin-NP/That, Tense Sequencing: Poss-ing* and *Gerund* with *Infin-NP* and *Possessive; Prep+Poss-ing* and *To Be-Deletion: Infin-NP/That* and negatively with *Tense Sequencing; Poss-ing/That* with *To-Deletion; Gerund/That* with *For-To* and *Tense Sequencing; To-Deletion* with *Possessive;* and finally, *To Be-Deletion* with *For-To*.

In comparing the three testings, it can be seen that the correlations changed over time. No two categories correlated on all three tests. Only the correlation between *That* and *Gerund/That* remained the





p. < .07

Fig. 15. Subcategorization Categories Percentages of Correct Responses

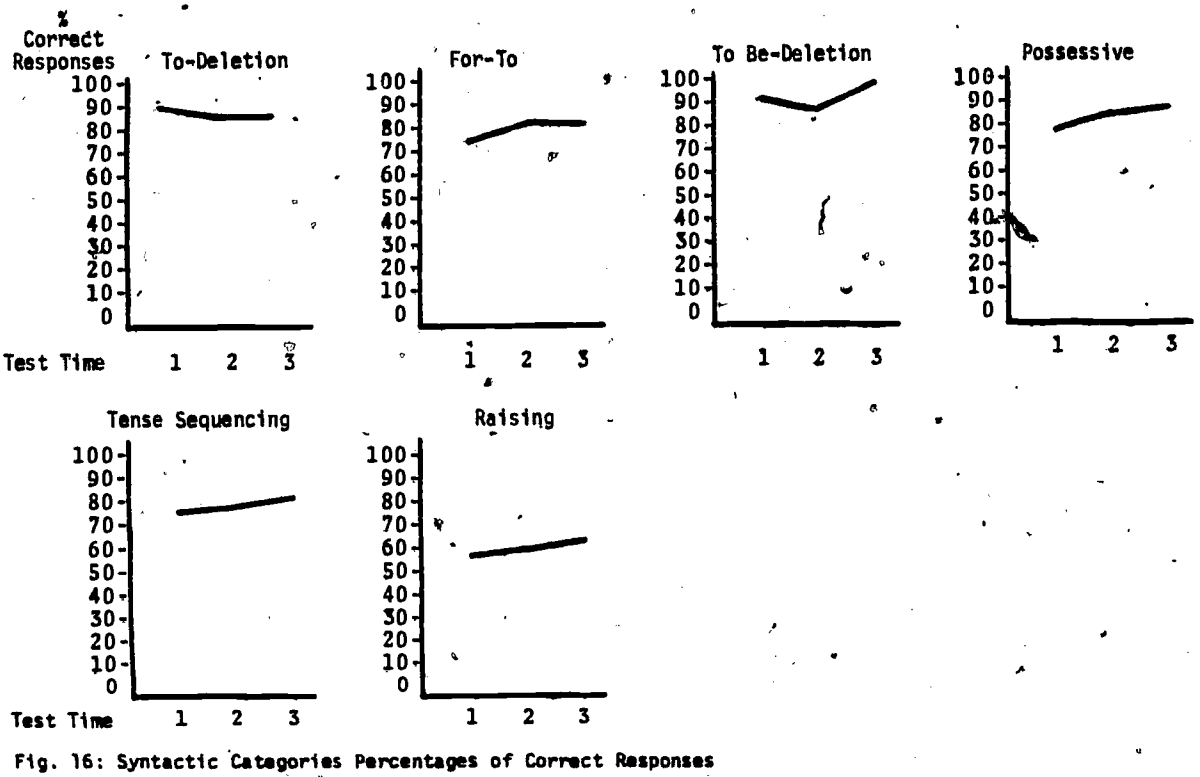


Fig. 16: Syntactic Categories Percentages of Correct Responses

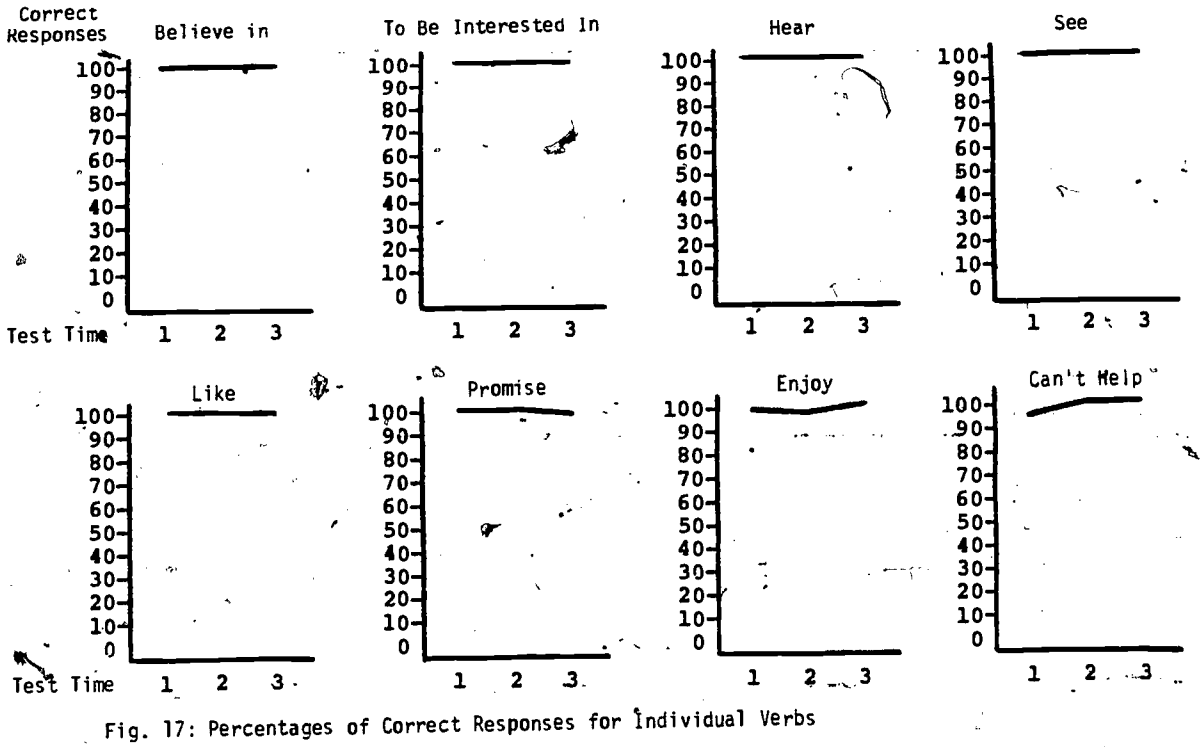
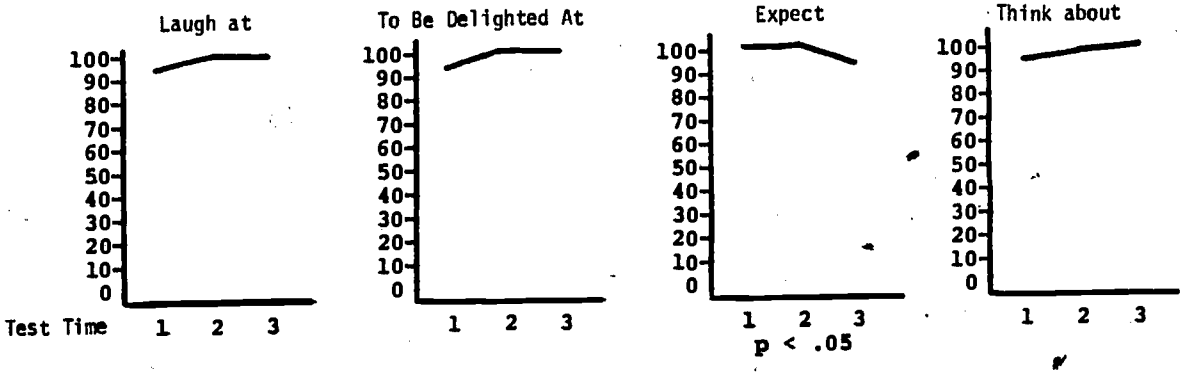


Fig. 17: Percentages of Correct Responses for Individual Verbs



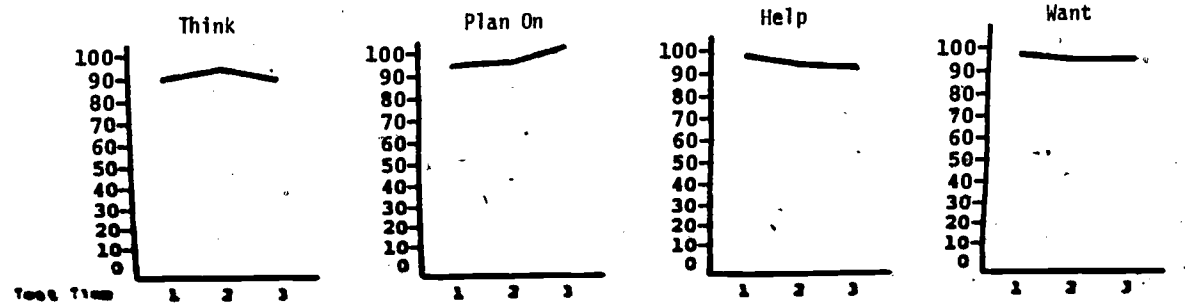
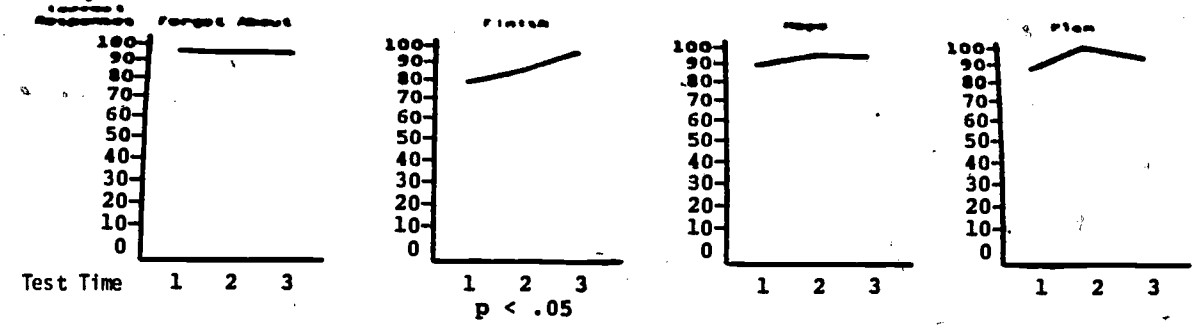
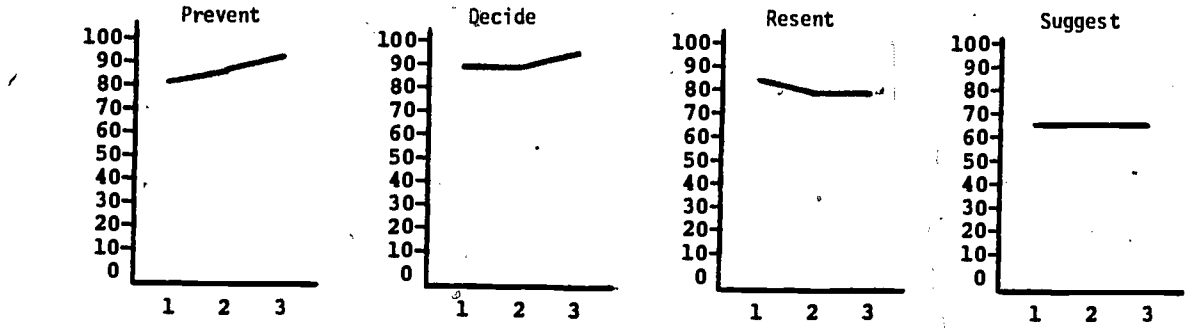


Fig. 17: Percentages of Correct Responses for Individual Verbs





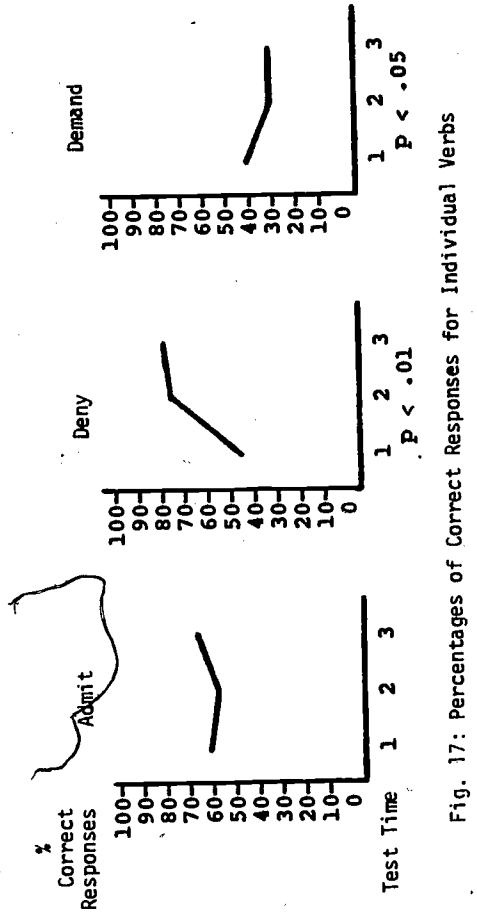


Fig. 17: Percentages of Correct Responses for Individual Verbs

same from testing one to testing two. *Infin-NP/That* correlated with *Gerund/That* in testings one and three but not two. Between the second and third testings, we find that four of the significant correlations remained the same from testing two to testing three: *Poss-ing* with *Gerund*, *That* with *Infin-NP/That* and *Tense Sequencing*, *Poss-ing/That* with *To-Deletion*. The first testing had six significant correlations; the second and third testings each had thirteen. But there were no correlations which appeared on all three testings. Thus, it does not appear to be the case that the verbs are being acquired in groups.

4.1.2.3 Correlation of Rankings for the Three Testings

Based on the group mean scores for the twenty-one subjects, rankings for each test time for both the subcategorization and syntactic categories were made to compare how these rankings (determined cross-sectionally at each point in time) changed over time. In the Rosansky study it was found that the rankings changed from test time to test time. The correlation of the rankings was done to see how the rankings for the categories on all three testings compared. The rank orderings are given in Table 25 for the subcategorization categories and Table 26 for the syntactic categories. The Spearman rank correlation coefficients are given in Table 27 for the subcategorization categories and in Table 28 for the syntactic categories.

As can be seen from Tables 27 and 28, the rankings for both the subcategorization and syntactic categories for all three testings correlated significantly. Thus, the rankings did not change significantly over time. Thus, although there were changes in the rankings from test time to test time, these changes were not significant statistically. For the subcategorization categories the greatest change in the rankings occurred on the third testing. One change involved the *Gerund* category. After having been ranked tenth and ninth respectively on the first and second testings, it moved up to 4.5 on the third testing. The other change occurred with *Infin-END* and *Infin-END/That*. On the first two testings, these two categories were among the easiest but on the third testing both categories dropped down to 7.5. For the syntactic categories, there were no dramatic changes in the rankings. The rankings remained virtually the same.

A second analysis was done to see if the ranking based upon the group mean scores would correlate significantly with a ranking based upon the actual order of difficulty across time for individual subjects.

TABLE 22. CORRELATION OF COEFFICIENTS TESTING 1

	Infin-END	Infin-END/Gerund	Infin-NP/Gerund	Infin-NP	Prep+Poss-ing	Poss-ing	Prep+Gerund	Gerund	That	Infin-END/That	Poss-ing/That	Gerund/That	Infin-NP/That	To Be Deletion	For-To	Possessive	To Deletion	Tense Sequencing	Raising
Infin-END	—																		
Infin-END/Gerund	.0	—																	
Infin-NP/Gerund	.0	.0	—																
Infin-NP	.0	.0	.0	—															
Prep+Poss-ing	.0	.0	.0	-.10	—														
Poss-ing	.0	.0	.0	-.17	.58	—													
Prep+Gerund	.0	.0	.0	.04	.14	-.05	—												
Gerund	.0	.0	.0	.06	-.07	.37	-.07	—											
That	.0	.0	.0	.17	-.08	.23	-.08	.20	—										
Infin-END/That	.0	.0	.0	-.13	-.18	.09	-.18	.08	.43	—									
Poss-ing/That	.0	.0	.0	.11	.25	-.36	.25	.24	-.01	-.06	—								
Gerund/That	.0	.0	.0	-.30	-.12	.35	-.12	.21	.43	.53	.20	—							
Infin-NP/That	.0	.0	.0	.16	.01	.33	.01	.31	.11	.32	.03	.67	—						
To Be Deletion	.0	.0	.0	-.16	-.15	-.36	-.36	-.26	-.19	-.18	.13	-.30	-.36	—					
For-To	.0	.0	.0	.18	.00	.00	.00	.04	.04	.00	.00	.11	.11	.11	—				
Possessive	.0	.0	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	—			
To Deletion	.0	.0	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	—		
Tense Sequencing	.0	.0	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	—	
Raising	.0	.0	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	—

	Infin-END	Infin-END/Gerund	Infin-NP/Gerund	Infin-NP	Prep+Poss-ing	Poss-ing	Prep+Gerund	Gerund	That	Infin-END/That	Poss-ing/That	Gerund/That	Infin-NP/That	To Be Deletion	For-To	Possessive	To Deletion	Tense Sequencing	Raising
Infin-END	—																		
Infin-END/Gerund	.0	—																	
Infin-NP/Gerund	.0	.0	—																
Infin-NP	.0	.0	.0	—															
Prep+Poss-ing	.0	.0	.0	-.13	—														
Poss-ing	.0	.0	.0	.0	-.09	—													
Prep+Gerund	.0	.0	.0	-.24	-.09	.61	—												
Gerund	.0	.0	.0	-.05	-.09	.49	.49	—											
That	.0	.0	.0	.04	-.07	-.13	-.13	-.15	—										
Infin-END/That	.0	.0	.0	.0	.0	.0	.0	.0	.0	—									
Poss-ing/That	.0	.0	.0	-.27	-.19	.03	.22	.29	.26	.0	—								
Gerund/That	.0	.0	.0	-.12	.04	.07	-.11	.01	.44	.0	.11	—							
Infin-NP/That	.0	.0	.0	-.06	-.27	-.04	-.19	.10	.52	.0	.27	.40	—						
To Be-Deletion	.0	.0	.0	.36	-.11	-.20	-.20	-.23	.33	.0	.26	.33	.21	—					
For-To	.0	.0	.0	-.06	-.18	.62	.48	.26	.25	.0	.18	-.15	.04	-.38	—				
Possessive	.0	.0	.0	-.29	-.0	.17	.17	.01	.03	.0	.22	.05	.06	-.05	.33	—			
To-Deletion	.0	.0	.0	.04	-.01	.34	.71	.68	-.05	.0	.59	-.06	-.01	-.07	.25	.18	—		
Tense Sequencing	.0	.0	.0	.04	-.17	-.34	-.35	-.23	.70	.0	.17	.36	.45	.34	-.28	-.10	-.23	—	
Raising	.0	.0	.0	.11	.13	-.48	-.35	-.15	.13	.0	.06	.05	.36	-.0	-.31	.52	-.12	.37	—

TABLE 24. CORRELATION OF COEFFICIENTS TESTING 3

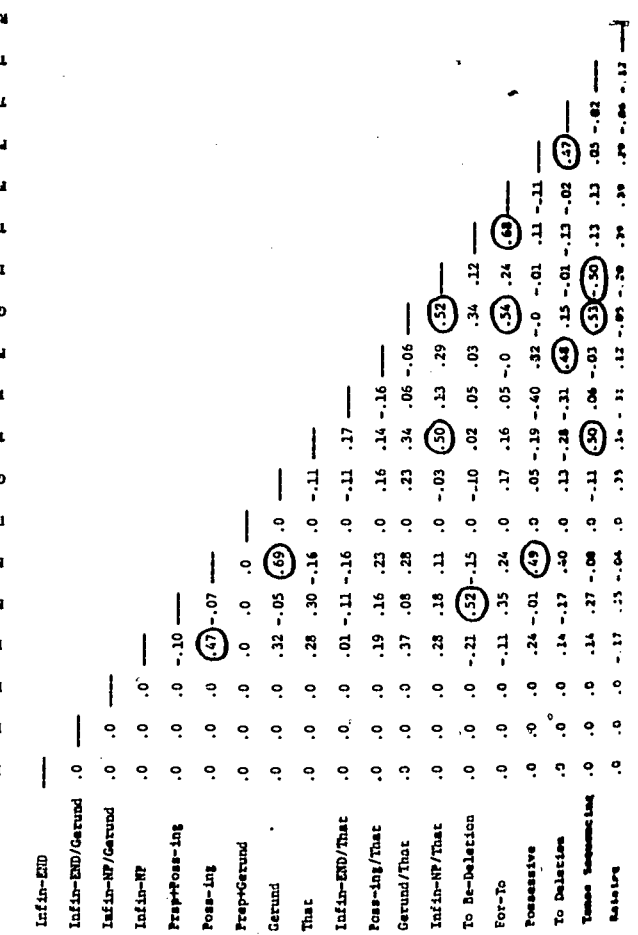


TABLE 25

CROSS-SECTIONALLY DERIVED RANKINGS FOR THREE TESTINGS
SUBCATEGORIZATION CATEGORIES

Categories	*Test Time 1*	*Test Time 2*	*Test Time 3*
Infin-END/Gerund	2	2.5	2
Infin-NP/Gerund	2	2.5	2
Infin-END	2	2.5	7.5
Infin-END/That	4.5	2.5	7.5
Prep+Poss-ing	4.5	5.5	4.5
Prep+Gerund	6.5	5.5	2
Infin-NP	6.5	8	9
Poss-ing	8	7	6
That	9	6	10
Gerund	10	9	4.5
Infin-NP/That	11	10	11
Poss-ing/That	12	11	12
Gerund/That	13	12	13

TABLE 26

CROSS-SECTIONALLY DERIVED RANKINGS FOR THREE TESTINGS
SYNTACTIC CATEGORIES

Categories	*Test Time 1*	*Test Time 2*	*Test Time 3*
To Be-Deletion	1.5	1.5	1
To-Deletion	1.5	1.5	2.5
Possessive	3	3	2.5
For-To	4.5	4	4
Tense Sequencing	4.5	5	5
Raising	6	6	6

TABLE 27

SPEARMAN RANK COEFFICIENTS: RANK ORDERINGS
FOR SYNTACTIC CATEGORIES

	Test Time 1	*Test Time 2*	*Test Time 3*
Test Time 1	1.00		
Test Time 2	.94*	1.00	
Test Time 3	.72*	.71*	1.00

*p <.01

TABLE 28

SPEARMAN RANK COEFFICIENTS: RANK ORDERINGS FOR SYNTACTIC CATEGORIES

	Test Time 1	*Test Time 2*	*Test Time 3*
Test Time 1	1.00		
Test Time 2	.99*	1.00	
Test Time 3	.94*	.96*	1.00

* $p < .01$

Whereas the ranking based upon group mean scores is determined by the percentage of correct responses, a ranking based on the order of difficulty across time is determined by the number of subjects who received high scores for categories on all three testings, on the second and third testing, and on the third testing only. Such a ranking is thus based upon an implicational ordering. If a subject received a score of 88 or above for a category, he was credited with having mastered that category. Table 29 presents the number of subjects who received scores of 88 or above for each of the six syntactic categories on the three testings. In order to determine a ranking, the numbers of subjects for each category are weighted according to their occurrence. Thus, the numbers for each category under "Test Times 1, 2, 3" are multiplied by three since a score of 88 or above was received on all three testings by the subjects. The numbers for each category under "Test Times 2, 3" are multiplied by two since two testings were involved. The weighted scores are then summed for each category. A ranking is then based upon the resultant sum for each category. (See Table 30.) This ranking was then compared with the ranking based upon the group mean scores for the twenty-one subjects. The Spearman rank coefficient was .83, which is significant at the .05 level. Thus, the ranking based upon the percentages of correct responses correlated significantly with the ranking based upon an implicational ordering.

4.1.2.4 Group Versus Individual Rankings of Difficulty

An examination of the individual scores for each category reveals that orderings derived for the group are not necessarily representative of every individual subject. Scores for the individual subjects on the subcategorization categories are presented graphically in Figure 18. Scores for these same individual subjects on the syntactic categories

TABLE 29

NUMBER OF SUBJECTS WHO RECEIVED SCORES OF 88 OR ABOVE ON TESTS ONE, TWO, THREE; ON TESTS TWO AND THREE; AND ON TEST THREE ONLY

Syntactic Categories	*Test Times 1, 2, 3*	*Test Times 2, 3*	*Test Time 3*
To-Deletion	12	12	15
For-To	7	9	12
To Be-Deletion	13	15	17
Possessive	3	7	13
Tense Sequencing	5	1	5
Raising	1	1	3

TABLE 30

WEIGHTED SCORES, THEIR SUM, AND THE RESULTANT RANKING

Syntactic Categories	*Test Times 1, 2, 3*	*Test Times 2, 2*	*Test Time 3*	*Sum*	*Ranking*
To-Deletion	36	24	15	75	2
For-To	21	18	12	51	3
To Be-Deletion	39	30	17	86	1
Possessive	9	14	13	36	4
Tense Sequencing	15	2	5	22	5
Raising	3	2	3	8	6

are presented graphically in Figure 19. For both sets of categories, a comparison of the individual subjects reveals that there is a great deal of variability for each individual subject with regard to the difficulty of various categories over time.

KEY

- Infin-END/Gerund
- Infin-NP/Gerund
- Infin-END
- Infin-END/That
- Prep+Poss-ing
- Prep+Gerund
- Infin-NP
- Poss-ing
- That
- Gerund
- Poss-ing/That
- Gerund/That
- Infin-NP/That

Fig. 18. Percentages of Correct Responses over Time for Individual Subjects, Subcategorization Categories (Fig. 18 continued on pp. 111-116).

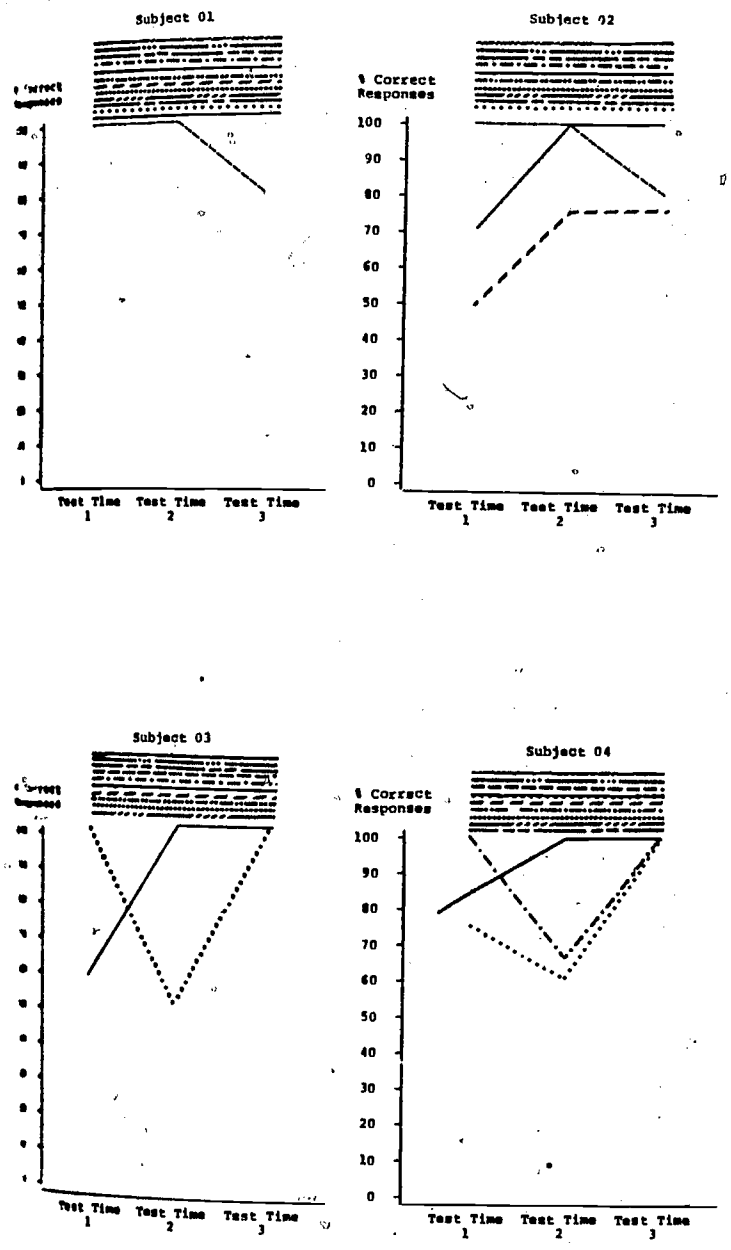
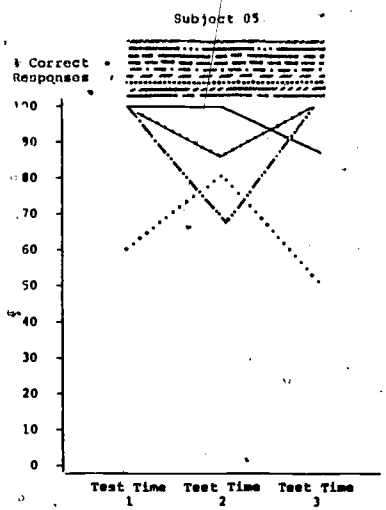
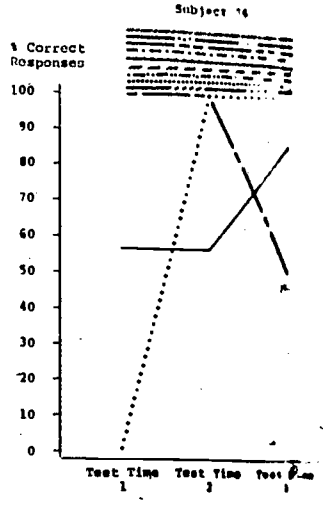
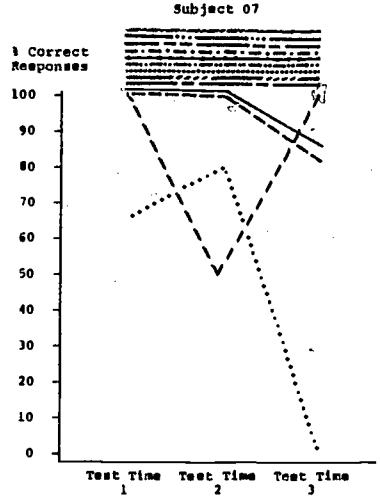
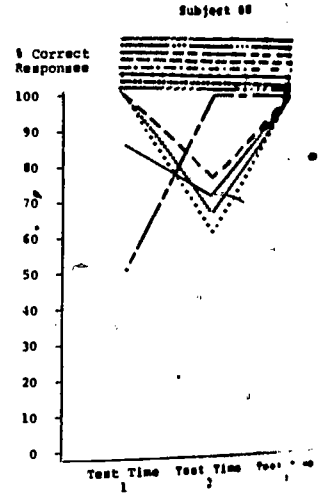


Fig. 18. (Continued.)









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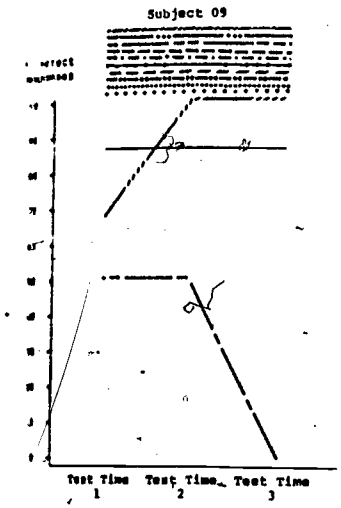

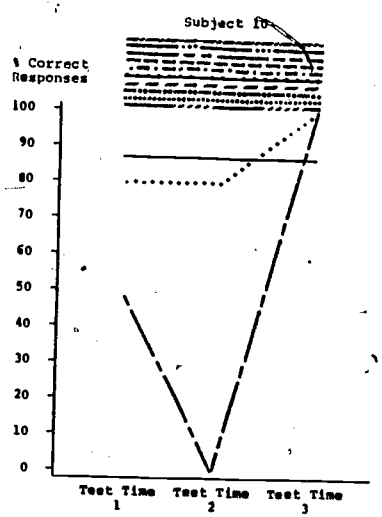

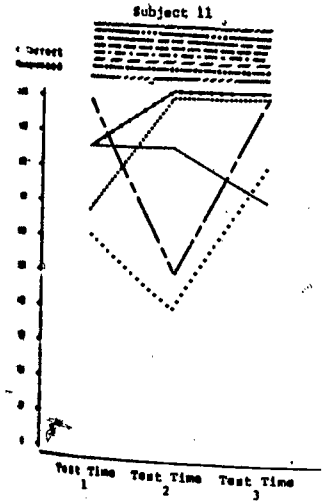

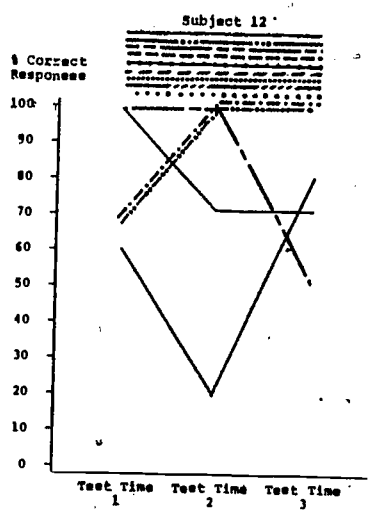

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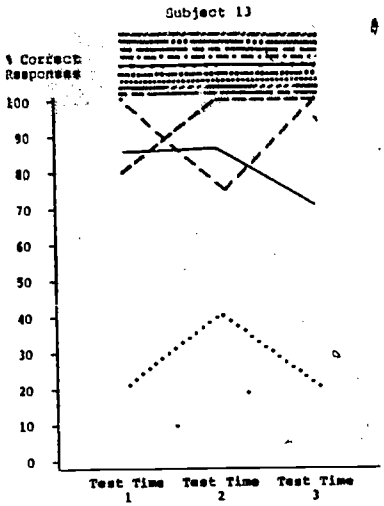

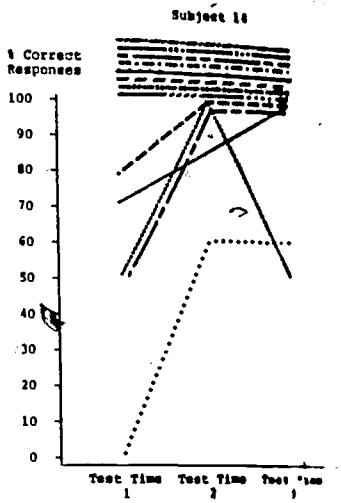

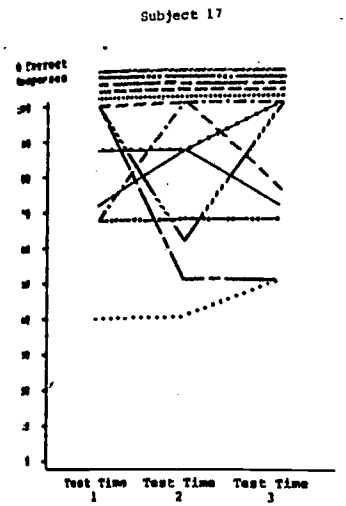

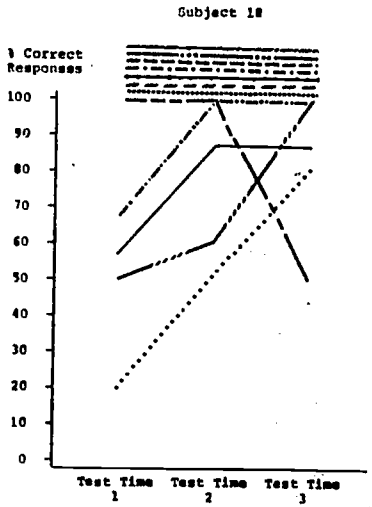

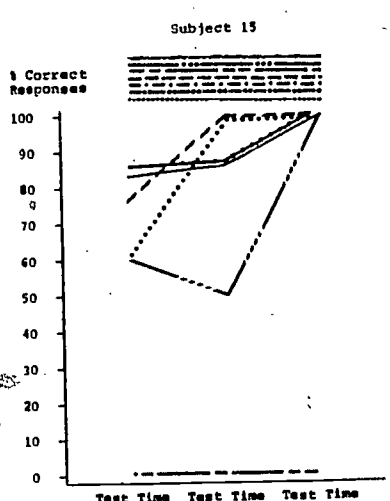

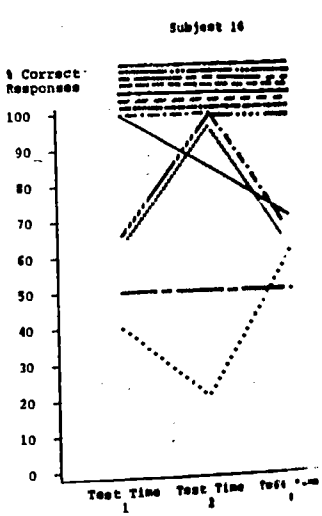

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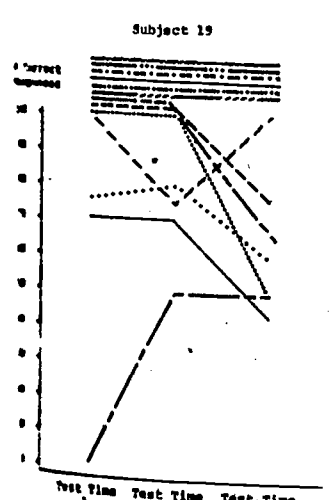

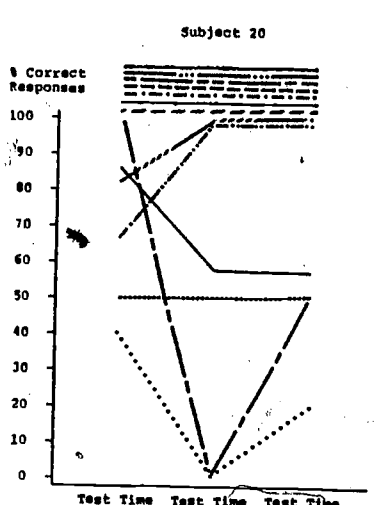

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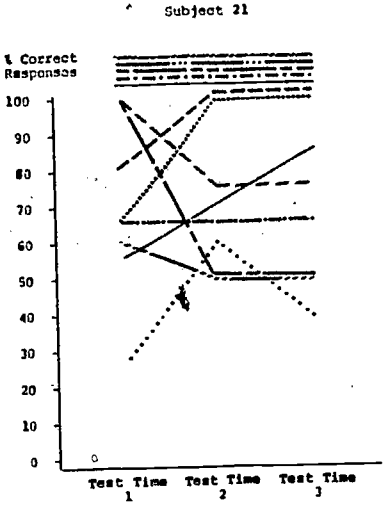

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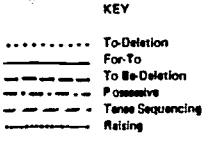


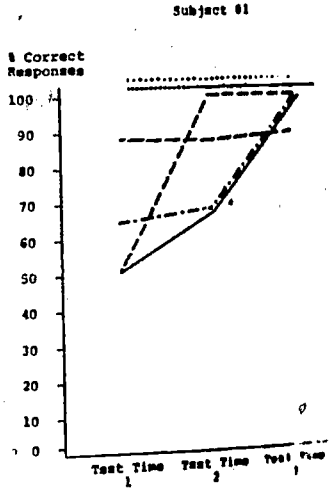
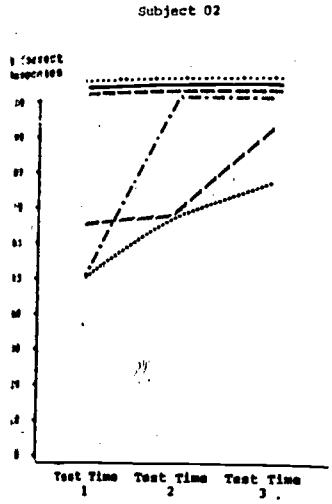
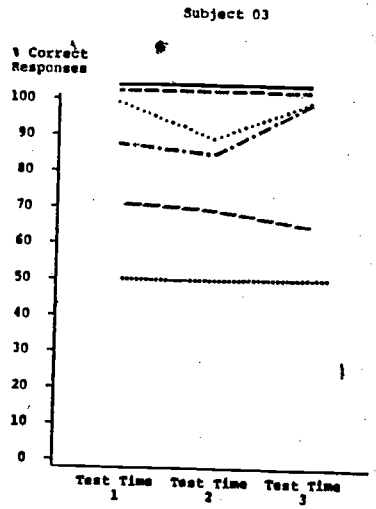
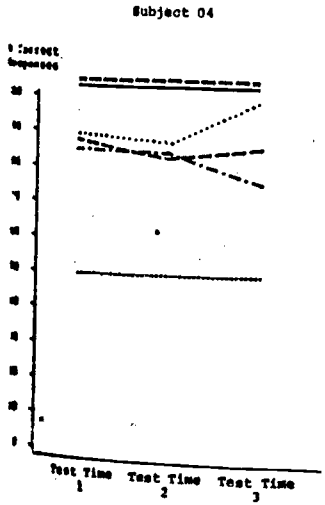
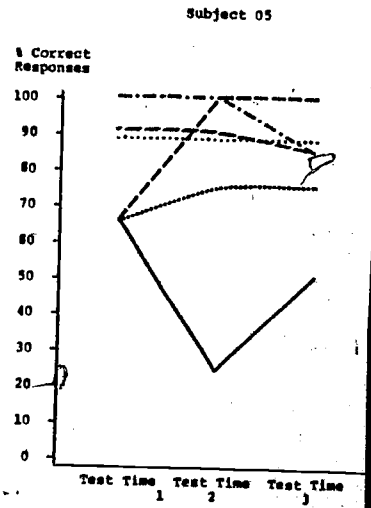


Fig. 19. Percentages of Correct Responses Over Time for Individual Subjects, Syntactic Categories (Fig. 19 continued on pp. 117-121)









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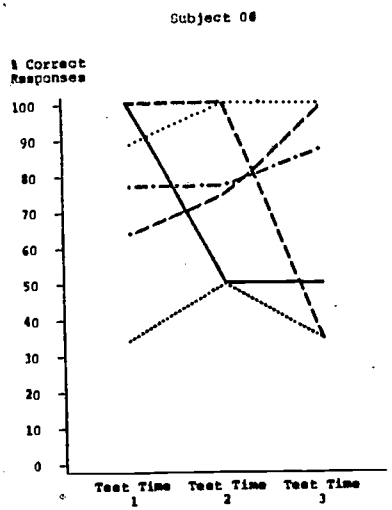

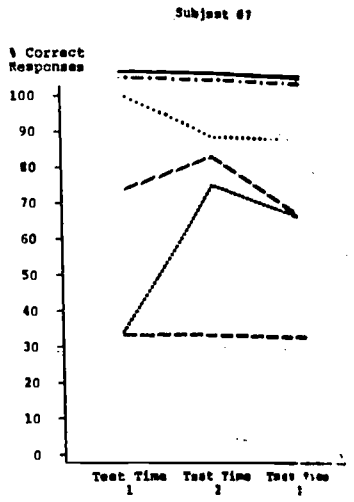

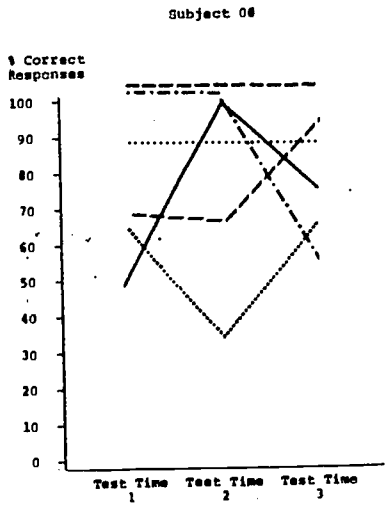

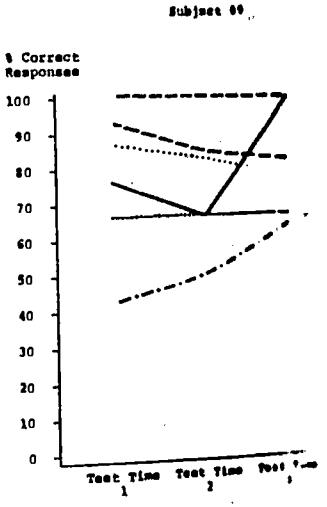

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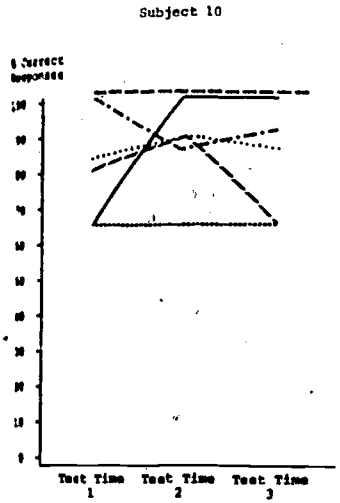

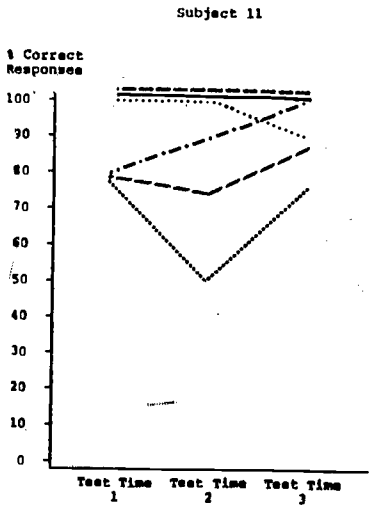

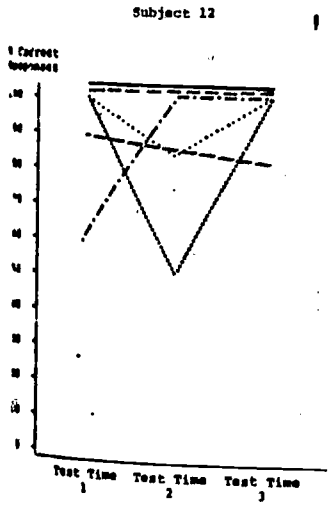

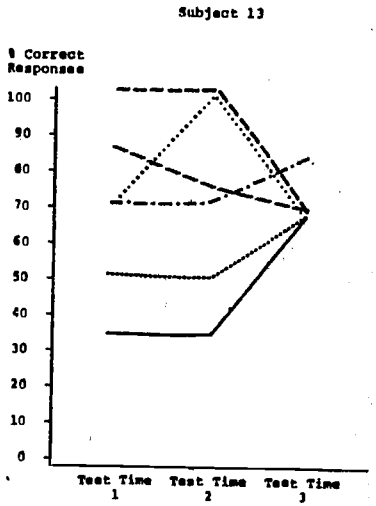

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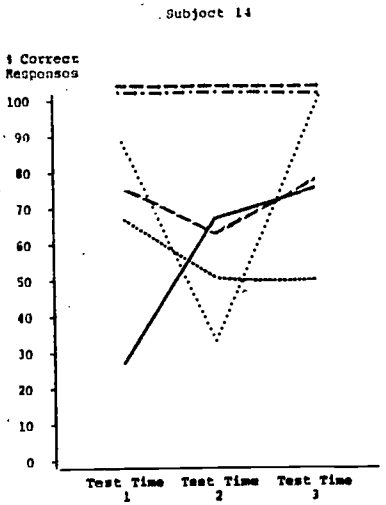
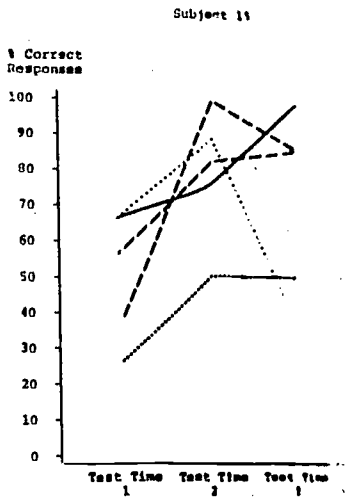
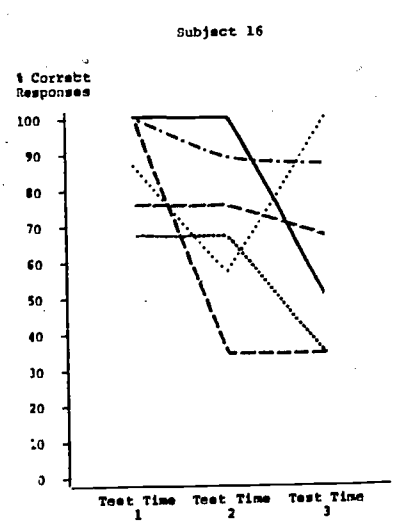






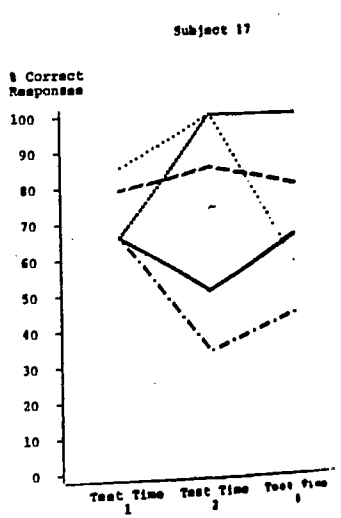
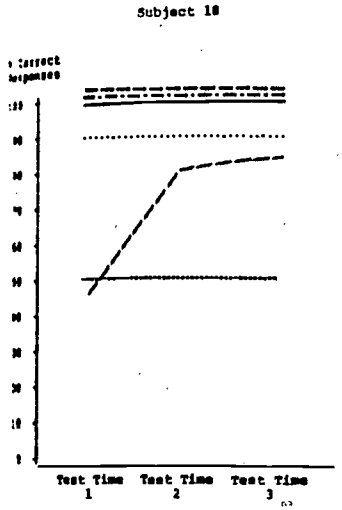
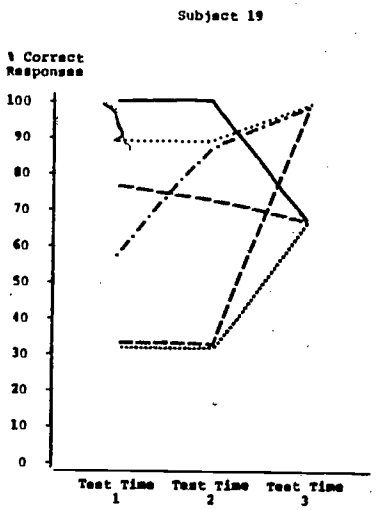
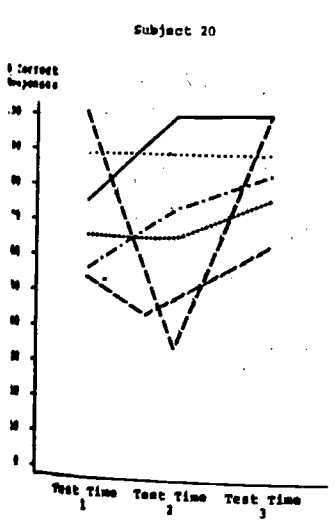


Fig. 19. (Continued.)







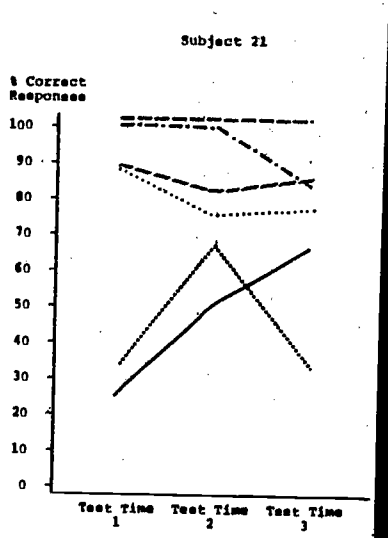


Fig. 19. (Continued.)

From the graphs for the individual subjects it is apparent that there is a great deal of variation from one subject to another. Even for each individual there is a great deal of variation in the ranking order from one test time to the next.[1] It is not the case that the rankings are maintained over all three testings, as in the Dickerson (1975) study, and that the learning process could be thought of as a continuum.

4.1.2.5 Correlation of Individual Rankings of Difficulty Across Time

In order to determine the amount of variation from one test time to the next for each subject, an analysis was done to see if the rankings for each testing correlate significantly. Table 31 presents the Spearman rank coefficients for each of the twenty-one subjects. Six out of the twenty-one subjects had significant correlations for all three testings. Three subjects had significant correlations between testings one and two and two subjects had significant correlations between testings two and three. For ten of the subjects, there were no significant correlations for any of the three testings. Thus, for half of the subjects the rankings for each testing did not correlate significantly with each other. For only about a third of the subjects did the rankings for all three testings correlate significantly. As found in 4.1.2.4, there seems to be variation in individual rankings across time.

1 A cautionary comment is in order when examining the individual graphs. It would appear that for certain categories there are dramatic leaps from one testing to the next for an individual. In some cases, however, these dramatic leaps are due more to the limited number of items for a certain category than to a drastic change in an individual's interlanguage. If there are two items in a category and an individual gets both correct on the first testing but misses one on the second testing, the percentage on the first testing (ie., 100 %) drops drastically on the second testing (ie., 50 %). This flaw in the test, however, does not invalidate the point being made: there is a great deal of variation for a subject from one testing to the next. Even for categories in which there were numerous items, there is variation between testings.

TABLE 31

SPEARMAN RANK COEFFICIENTS: RANK ORDERINGS ON ALL THREE TESTINGS FOR EACH SUBJECT

Test Times / Subjects	I/II	I/III	II/III
01	.54	.23	.44
02	.91*	.91*	1.00**
03	.96**	.91*	.87*
04	.94*	.96**	.90*
05	.54	.30	.76
06	.41	-.09	.30
07	.94*	.91*	.86*
08	.44	.19	.09
09	.99**	.76	.67
10	.17	.39	.76
11	.99**	.77	.76
12	.04	.79	.43
13	.84	.37	.13
14	.49	.90*	.39
15	.51	.39	.27
16	.26	.16	.21
17	.66	.33	.70
18	.94*	.94*	1.00**
19	.94*	-.04	.13
20	.03	.84*	.30
21	1.00**	.84*	.84*

* $p < .05$ ** $p < .01$

4.1.2.6 Consistency

The concept of internal consistency in the use of forms at a single point in time and over time by a language learner has become crucial in second language acquisition research. Such consistency indicates that the language learning process is not haphazard but follows certain constraints. This section focuses on the patterns found in the subjects' responses at one point in time and over time in order to determine the degree of consistency present.

One of the first articles to discuss the notion of consistency in second language acquisition was by Tarone et al. (1976). In this article, the problem of accounting for inconsistency both at one point in time and over time was discussed and a procedure for analyzing such inconsistency based upon Labov (1970) was presented. Their procedure involved categorizing possible response types. In categorizing responses for one point in time, a response that was used more than ninety percent or less than ten percent of the time in an obligatory context was classified as systematic while a variant that occurred between ten and ninety percent of the time in an obligatory context was categorized as variable. Across time, if the responses on the two testings were both systematic or both variable, they were categorized as stable. If on one testing the responses were systematic but on the other they were variable, the responses were termed as instable. Instable patterns indicated either improvement or backsliding.

The classification of responses as either systematic or variable and as either stable or instable helps to show which linguistic items in a language learner's system are permeable and which are not. The problem with the Tarone et al. (1976) procedure is that there is no attempt to find out if the individual variability is systematic. Tarone et al.s use of the term variability for the opposite of systematic is actually unfortunate. Sociolinguists such as Labov (1969, 1970) have shown that much variation is systematic and not random when the environment is taken into consideration. Tarone et al. make no attempt to determine whether the inconsistency found in the data is random or environment-sensitive. The work by Dickerson (1975) on the acquisition of second language phonology has shown that phonological variants are environment-sensitive. Syntactic variants are also environment-sensitive, as seen in Section 4.1.1.3, where complement choice and complement errors were influenced by whether the environment was *NP* or *END*.

In this section an analysis adapted from Tarone et al.'s procedure is first presented. As started above, such an analysis is useful because it shows the number of people for whom the items are stable or instable. Because this type of analysis does not take into account the influence of the environment on the consistence of items, an examination of the responses of individual subjects is presented to determine whether responses were systematic at each test time. Table 32 presents the eleven logically possible response patterns. The five items investigated were *Infin-NP/That, Possi-ing/That, Gerund/That, Possessive*, and *Tense Sequencing*. These five items were among the most difficult for the subjects and had numerous examples included in the test. Response patterns I, II, and III are examples of stability because there is no change over time. Response patterns IV through VII are examples of improvement since the percentages increase more than ten percent between the second and third testings. Patterns VIII through XI are examples of backsliding since there is a decrease of more than ten percent between the second and third testings.

Table 34 presents the number of subjects exhibiting each of the eleven patterns for the three selected subcategorization categories. Although not all response patterns are exhibited for each category, no one response pattern was exhibited by a majority of the subjects for a category. Progress over time for each category varied from individual to individual.

TABLE 32

LOGICALLY POSSIBLE RESPONSE PATTERNS OVER TIME

Response Pattern	*Definition*
I	Perfect score on all three tests
II	Zero score on all three tests
III	No change over time for scores above 0 % and less than 100 % (difference < 10 %)
IV	Gradual improvement over all three testings
V	Consistency between first and second testings, with improvement on third testing
VI	Improvement between first and second testings, with leveling between second and third testings
VII	Drop between first and second testings, with improvement between second and third testings
VIII	Gradual decrease over all three testings
IX	Consistency between first and second testings, with decrease on third testing
X	Drop between first and second testings, with leveling between second and third testings
XI	Improvement between first and second testings, with drop between second and third testings

The eleven response patterns given in Table 32 can be categorized as presented in Table 33.

TABLE 33

RESPONSE PATTERN CATEGORIZATION

	Stability	*Instability*	
		Improvement	*Backsliding*
Response Patterns	I	IV	VIII
	II	V	IX
	III	VI	X
		VII	XI

TABLE 34

NUMBER OF SUBJECTS REPRESENTING DIFFERENT RESPONSE PATTERNS FOR THREE SUBCATEGORIZATION CATEGORIES

	Stability			*Instability*							
				Improvement				*Backsliding*			
Response Patterns	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*X*	*XI*
Categories:											
Infin-NP/ That	2	2	0	3	1	3	1	1	5	2	1
	Total: 4			Total: 8				Total: 9			
Poss-ing/ That	7	2	0	0	0	4	3	0	3	2	0
	Total: 9			Total: 7				Total: 5			
Gerund/That	1	3	0	1	2	3	6	0	0	0	5

For the three subcategorization categories, there were seventeen instances of stability, twenty-seven cases of improvement, and nineteen cases of backsliding. Although the response patterns indicating improvement had the highest number, stability and backsliding are clearly present. For *Infin-NP/That* and *Poss-ing/That*, no one single response pattern was prevalent; for *Gerund/That* the response patterns indicating improvement, especially VII, were highest in number.

In analyzing the individual responses over time for the syntactic categories, individual differences were again found. The two syntactic categories examined were *Possessive* and *Tense Sequencing*. The number of subjects exhibiting each of the various response patterns are in Table 35.

TABLE 35

NUMBER OF SUBJECTS REPRESENTING DIFFERENT RESPONSE PATTERNS FOR TWO SYNTACTIC CATEGORIES

	Stability			*Instability*							
				Improvement				*Backsliding*			
Response Patterns	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*	*IX*	*X*	*XI*
Categories:											
Possessive	3	0	0	4	4	2	2	0	4	1	1
	Total: 3			Total: 12				Total: 6			
Tense Sequencing	0	3	0	1	2	2	3	5	1	1	3
	Total: 3			Total: 8				Total: 10			

For *Possessive*, there were only three instances of stability but twelve instances of improvement and six instances of backsliding. *Tense Sequencing* had three instances of stability also, eight instances of improvement and ten instances of backsliding. The responses for possessive showed that there was more improvement over time than there was for tense sequencing, which had almost an equal number of improvement and backsliding responses.

From Tables 34 and 35, it is evident that there is a great deal of instability among the subjects for the categories examined. Moreover, there is a great deal of diversity with regard to the patterns exhibited by the students. In other words, no one response pattern had the majority of students exhibiting it on all the categories examined.

Although not much stability was evident in the subjects' responses, investigation did seem to indicate a certain amount of systematicity for certain verbs by some of the subjects. The investigation involved examining cases in which, when only one complement is correct, there is exclusive use of one incorrect complement. In other words, the subject uses only one complement type and does not use during the same test time an incorrect complement for one item and a correct one on the next. Evidence of such consistent incorrect subcategorization would confirm the notion of systematicity in interlanguage.

Two subjects exhibit evidence of systematicity with their preference for certain complement types with *finish*. On the first and second testings, both subjects consistently used infinitival complements with *finish*, which allows only the gerundive complement. The clausal comple-

TABLE 36

COMPLEMENT RESPONSES FOR *FINISH* FOR THE THREE TESTINGS BY TWO SUBJECTS

Subject 15

	Type of Complement		
Item Number	*Testing 1*	*Testing 2*	*Testing 3*
I.9	No Response	*Infinitival	Gerundive
IV.9	*Infinitival	*Infinitival	Gerundive
VI.15	*Infinitival	*Infinitival	Gerundive

Subject 18

	Type of Complement		
Item Number	*Testing 1*	*Testing 2*	*Testing 3*
I.9	*Infinitival	*Infinitival	Gerundive
IV.7	*Infinitival	*Infinitival	Gerundive
VI.15	*Infinitival	No Response	Gerundive

* Incorrect Response

ment, an alternative incorrect response, was not used by either of the subjects with any of the *finish* test items. (See Table 36.) Both Subject 15 and 18 used the incorrect infinitival complement with *finish* for all items on testings one and two. On testing three both subjects used the correct gerundive complement. One explanation is that this exclusive use of the infinitival complement on testings one and two was not accidental but due to the subjects' having subcategorized the verb *finish* as taking an incorrect infinitival complement instead of a correct gerundive complement. With other subjects who did not select the correct response, both infinitival and gerundive complements were used.

For Subjects 09, 16, and 21 (see Table 37) there were instances where at one test time both the correct and incorrect complement type was used. For Subjects 09 and 16, the incorrect and correct forms were both used at test time one; on test time two and three only the correct form was used. For Subject 21, the incorrect form was used exclusively on testings one and two; on testing three both the correct and incorrect forms were used.

With Subject 17 and the verb *enjoy* (see Table 38), it would seem that this consistency is perhaps environment-sensitive. *Enjoy* allows

TABLE 37

COMPLEMENT RESPONSES FOR *FINISH* FOR THE THREE TESTINGS BY THREE SUBJECTS

Subject 09

	Type of Complement		
Item Number	*Testing 1*	*Testing 2*	*Testing 3*
I.9	Gerundive	Gerundive	Gerundive
IV.7	*Infinitival	Gerundive	Gerundive
VI.15	*Infinitival	Gerundive	Gerundive

Subject 16

	Type of Complement		
Item Number	*Testing 1*	*Testing 2*	*Testing 3*
I.9	*Infinitival	Gerundive	Gerundive
IV.7	Gerundive	Gerundive	Gerundive
VI.15	*Infinitival	Gerundive	Gerundive

Subject 21

	Type of Complement		
Item Number	*Testing 1*	*Testing 2*	*Testing 3*
I.9	Other Response	Other Response	*Infinitival
IV.7	*Infinitival	*Infinitival	*Infinitival
VI.15	*Infinitival	*Infinitival	Gerundive

*Incorrect Response

only the gerundive complement. On the first and third testings, the correct gerundive complement was used; on the second testing the gerundive complement was used with the NP-environment items but the incorrect infinitival complement was used with the END-environment items. Although an infinitive is in the stimulus sentence for item I.8, in item V.19 there is no infinitive stimulus. Thus, the use of the infinitive with items I.8 and V.19 does not appear to be simply due to interference. Thus, for the NP-environment items (ie., II.13 and III.3) there is evidence of stability and systematicity; in other words, both across time and at one time the correct gerundive complement was used exclusively. For *END*-environment items (ie., I.8 and V.19), however, there is no stability since the gerundive was not

TABLE 38

COMPLEMENT RESPONSES FOR *ENJOY* FOR THE THREE TESTINGS BY SUBJECT 17

Environment	*Item Number*	*Type of Complement* *Testing 1*	*Testing 2*	*Testing 3*
ENO	I.8	Gerundive	*Infinitival	Gerundive
	V.19	Gerundive	*Infinitival	Gerundive
NP	II.13	Gerundive	Gerundive	Gerundive
	III.3	Gerundive	Gerundive	Gerundive

*Incorrect Response

used on all three testings for these items but there does seem to be systematicity since when the incorrect complement item was used, it was used exclusively at that test time.

There is, however, an example which tends to indicate that interference can play a role. Table 39 gives Subject 11's responses on the three testings for *admit*, a verb which allows both the clausal and gerundive complements. Item I.7 was a translation task with the stimulus sentence containing an infinitive. On the first testing, Subject 11 consistently used the correct clausal complement with *admit* while on the second testing, the incorrect infinitival complement was used with all three items. On testing three the correct gerundive complement was used on the two non-translation items while with the translation item the incorrect infinitival complement was still used.

The data presented in Tables 36-39 tend to indicate that there is some degree of systematicity on the part of the subjects in selecting complements. With Subjects 09, 15, 18, and 21 consistent use of the incorrect form occurred before the consistent use of the correct form; for Subject 17 there was consistent use of the correct form, then backsliding where both the correct and incorrect forms were used, and then consistent use of the correct form. With *admit*, which allows two types of complements, Subject 11 exclusively used one correct complement on the first testing, then used only the incorrect form on the second testing, and on the third testing used both the correct and incorrect forms. More research needs to be undertaken in order to see how frequently these patterns (ie., exclusive use of incorrect form--variable use of incorrect and correct form--exclusive use of correct

TABLE 39

COMPLEMENT RESPONSES FOR *ADMIT* FOR THE THREE TESTINGS BY SUBJECT 11

Type of Stimulus	*Item Number*	*Type of Complement* *Testing 1*	*Testing 2*	*Testing 3*
Translation	I.7	Clausal	*Infinitival	*Infinitival
Non-translation	IV.10	Clausal	*Infinitival	Gerundive
Non-translation	VI.14	Clausal	*Infinitival	Gerundive

*Incorrect Response

form) appear with language learners. It also needs to be determined if a subject accepts an incorrect form as correct although he exclusively uses the correct form and vice versa--will the student accept as correct an incorrect form although he exlusively uses the correct form. It is interesting to note that when there is the choice of two incorrect complements, the infinitive complement is preferred. This corresponds to the overgeneralization of the infinitive discussed previously.

4.2 Comprehension

In this section the results of the comprehension section of the test are examined. It should be borne in mind that this was a very small part of the complementation test and that there was only one item for each category. There were four pairs of items (see Table 40 below).

The distinction between *easy* and *eager* was described in 3.3.2. *Easy/Eager* sentences have identical surface structures but are said to be generated by differing deep structures. With *eager*, the surface structure subject is the deep structure subject; in other words, *John* is the doer of the pleasing. With *easy*, however, the surface structure subject *Mary* is not the agent but the receiver of the action of pleasing. Although Mary appears in the surface as the subject, it is actually the object and in the deep structure is designated as such.

Promise and *ask* were also discussed in 3.3.2 since they also involve this distinction between surface structure and deep structure. In sentences with *ask*, the surface structure subject is not the agent of the complement verb. For example, in a sentence like "Mary asked Bill to leave", *Bill* is the one who is to leave. With *promise*, however,

TABLE 40

COMPREHENSION CATEGORY ITEMS

Category Items	*Item Number*
Easy/Eager	
John is eager to please.	VII.1
Mary is easy to please.	VII.6
Ask/Promise	
Mary asked Bill to leave.	VII.2
Jane promised Sam to come.	VII.5
Forget+INFIN/Forget+ING	
John forgot to tell Mary about the accident.	VII.4
John forgot telling Jane about the robbery.	VII.8
Stop+ING/Stop+INFIN	
Bill stopped to talk.	VII.7
Bill stopped smoking.	VII.3

the surface structure subject is also the subject of the complement verb. In a sentence like *Mary promised Bill to leave*, *Mary* is the one who must leave; *Bill* is the recipient of the promise.

With *forget* and *stop*, the type of complement used causes a difference in meaning. When an infinitive follows *forget*, the action of the complement verb is not completed because of the forgetting. When a gerundive follows *forget*, however, the action of the complement verb has been completed and then is forgotten. For sentences with *stop*, the infinitive form indicates that the activity of the complement verb was terminated in order to do something else while the use of the gerundive indicates that the activity of the complement verb was terminated. It is hypothesized that *forget+ING* and *stop+INFIN* will be more difficult than their counterparts since it is believed that the meaning of the verb will be interpreted as referring to the complement verb. In other words, if *stop* is used, the easier interpretation is that the activity of the complement verb has been stopped. If *forget* is used, it is easier to assume that the agent has forgotten to undertake the action of the complement verb.

4.2.1 Cross-Sectional Data

Table 41 provides the percentages of correct responses for the four sets of items for forty-two subjects. *Ask* and *forget+INFIN* were the easiest items, followed by *easy*. *Eager* ranked fourth, followed by *stop+ING* and *stop+INFIN* respectively. The most difficult items were *promise* and *forget+ING*. With regard to the difference in difficulty between two items of a set, there was not much difference between the scores of *easy* and *eager*. For *ask/promise*, *promise* received one of the lowest scores while *ask* received one of the highest, indicating that there was a great difference in ease between these two items. *Stop+ING* did not differ greatly in difficulty from *stop+INFIN* although the latter was the more difficult of the two. For the two forms of *forget*, the INFIN form was one of the easiest while the ING form was one of the hardest.

TABLE 41

PERCENTAGE OF CORRECT RESPONSES FOR THE EIGHT COMPREHENSION ITEMS

% *Correct*	*Item*
91	Easy
88	Eager
98	Ask
52	Promise
74	Stop+ING
60	Stop+INFIN
98	Forget+INFIN
50	Forget+ING

The ordering of difficulty for these comprehension items, based on the Bart and Krus theoretic ordering method, is given in Table 42, with the results being presented in chart from in Figures 20 and 21. The ordering for the pairs is as expected for *ask/promise* and *forget+INFIN/forget+ING*. There was no ranking between *stop+ING* and *stop+INFIN* and between *easy* and *eager*.

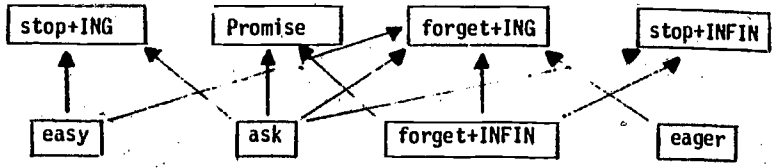


Fig. 20. Acquisition Hierarchy for Comprehension Items

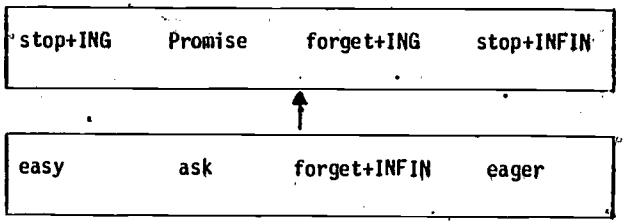


Fig. 21. Difficulty Tree for Comprehension Items

The results based upon the percentages of correct responses (ie., Table 41) and upon the Bart and Krus theoretic ordering method (ie., Figures 20 and 21) seem to correlate. In both analyses, *ask*, *easy*, *eager* and *forget+ING* were found to be more difficult than *stop+ING*, *stop+INFIN*, *promise*, and *forget+INFIN*. These results, however, do not seem to correspond to the results found by Anderson (1976). In the Anderson study it was found that *easy* constructions (Tough Movement) were easier than *eager* constructions (It-Substitution) and that both of these constructions were more difficult than *ask* constructions. *Promise* and *ask* sentences were found to be equal in difficulty. In the present study there was no ordering between *easy* and *eager* but there was an ordering between *promise* and *ask*. Thus, the two studies yielded different results. Nor do the results in the present study correspond to those found by d'Anglejan and Tucker (1975). They found that *easy* structures had the highest proportion of errors, followed by *ask* and *promise* respectively.

4.2.2 Longitudinal Data

Figure 22 shows the improvement over time for each of the eight comprehension items. *Promise*, *stop+INFIN*, and *forget+ING* demonstrated substantial improvement between the second and third testings. The other categories remained the same over all three testings, except for *eager*,

TABLE 42

MATRIX OF DISCONFIRMATORY RESPONSES, COMPREHENSION ITEMS

	Eager	*Easy*	*Ask*	*Promise*	*Stop+ING*	*Stop+INFIN*	*Forget+INFIN*	*Forget+ING*
Eager	---	9.5	11.9	9.5	9.5	9.5	11.9	(2.4)
Easy	7.1	---	9.5	(2.4)	9.5	7.1	9.5	(2.4)
Ask	2.4	2.4	---	(0.0)	(0.0)	(0.0)	2.4	(0.0)
Promise	45.2	40.5	45.2	---	35.7	26.2	35.7	26.2
Stop+ING	19.1	21.4	19.1	9.5	---	11.9	21.4	11.9
Stop+INFIN	42.9	42.9	42.9	23.8	35.7	---	35.7	19.1
Forget+INFIN	2.4	2.4	2.4	(0.0)	2.4	(0.0)	---	(2.4)
Forget+ING	40.5	42.9	47.6	23.8	40.5	23.8	50.0	---

Tolerance Level: .05

TABLE 43

CROSS-SECTIONALLY DERIVED RANKING

Categories	*Test Time 1*	*Test Time 2*	*Test Time 3*
Eager	4.3	3	5
Easy	3	3	2.5
Ask	1	1	1
Promise	7.5	6.5	7
Stop+ING	5	5	4
Stop+INFIN	6	6.5	7
Forget+INFIN	2	3	2.5
Forget+ING	7.5	8	7

TABLE 44

SPEARMAN RANK COEFFICIENTS

	Test Time 1	*Test Time 2*	*Test Time 3*
Test Time 1	1.00		
Test Time 2	.92*	1.00	
Test Time 3	.94*	.90	1.00

*p < .01

which rose slightly on the second testing but fell on the third testing.

Table 43 presents the rankings of the comprehension items on all three testings. The rankings do not change significantly over time. The Spearman Rank Coefficients were significant at the .01 level for all the tests, as evidenced in Table 44.

Whereas with the production items, the individual percentages of correctness for the different items were charted for the comprehension on items an implicational scale was used. This was done since there was only one example of each comprehension item. Figure 23 presents a breakdown of the subjects' responses over time. There are frequent cases of backsliding between testings. Moreover, there is diversity among the subjects with regard to which categories can be comprehended correctly before others and their difficulty over time. For example, whereas

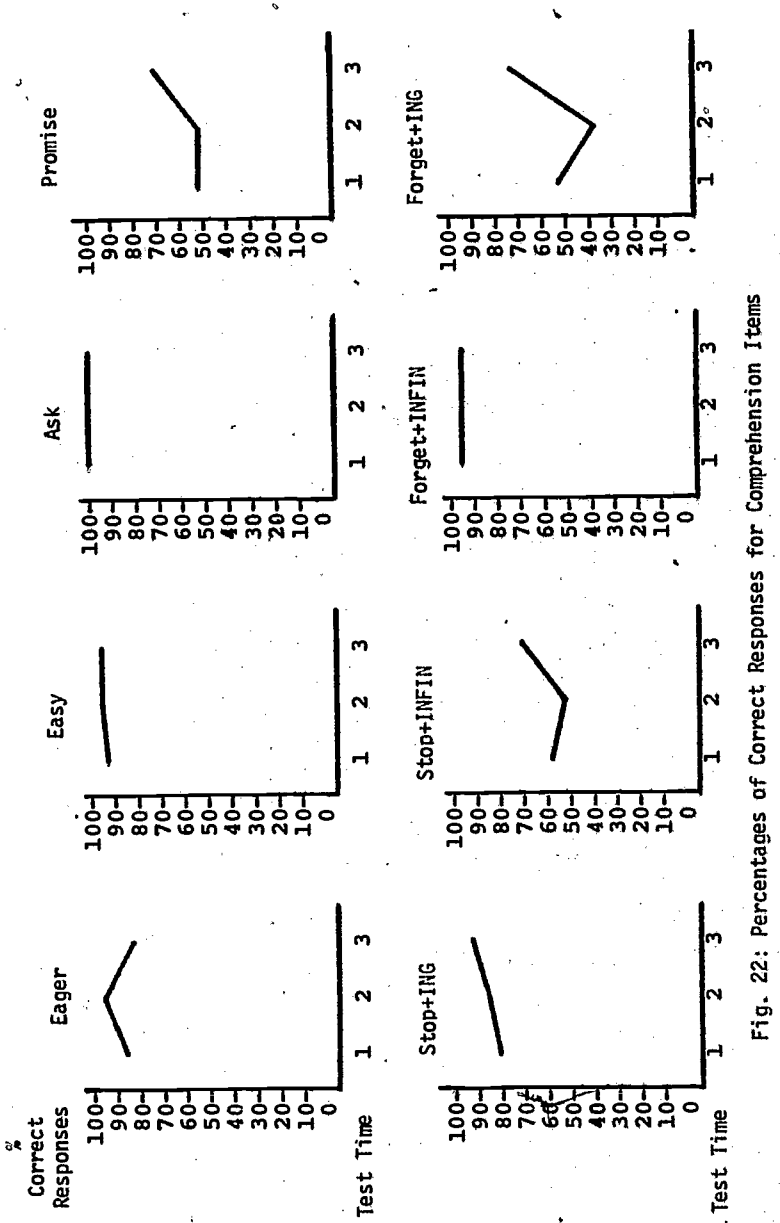


Fig. 22: Percentages of Correct Responses for Comprehension Items

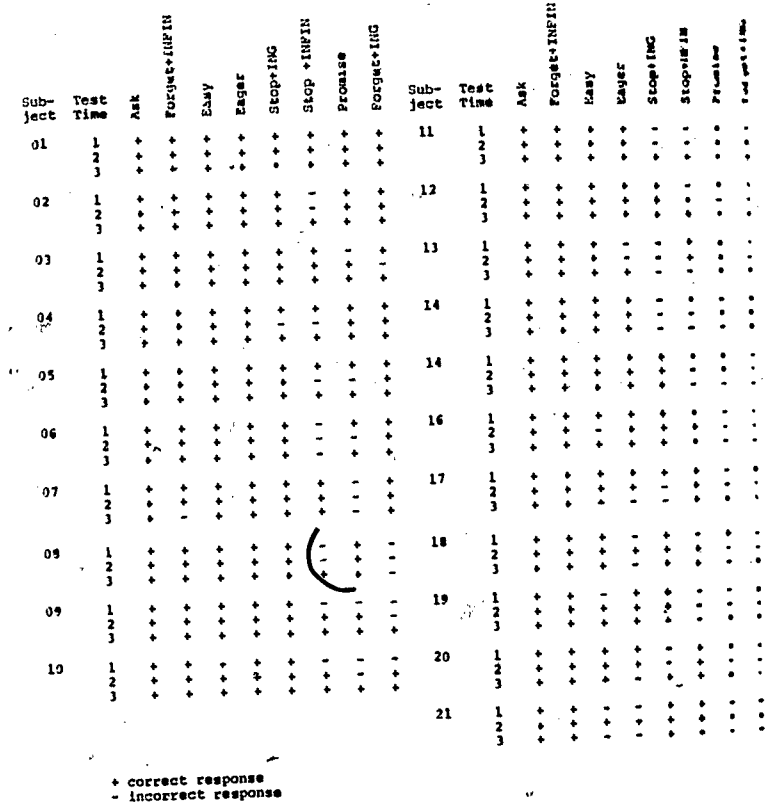


Fig. 23. Implicational Ordering

Subjects 09, 10, and 12 got the items with *stop+INFIN*, *promise*, and *forget+ING* wrong on the first testing, on the second testing Subject 09 had trouble only with *forget+ING*. Subject 10, on the other hand, had problems with *promise* only; and both *promise* and *forget+ING* caused problems for Subject 12. On the third testing all three subjects had the categories correct.

In summary, the results from the comprehension section of the test showed that *ask*, *forget+INFIN*, *easy* and *eager* were easier than *promise*, *forget+ING*, *stop+ING*, and *stop+INFIN*. There were orderings between the pairs *ask/promise* and *forget+ING/forget+INFIN* but none between *stop+ING/stop+INFIN* and *easy/eager*. The orderings in the present study did not seem to correlate with those in either the Anderson (1976) study or the d'Anglejan and Tucker (1975) study. The difficulty rankings remained the same on all three testings but three of the four most difficult items did show an increase in the percentage correct over time. As with the production data, there seemed to be a great deal of individual diversity in which items remained difficult over time for the subjects.

CHAPTER 5

DISCUSSION AND CONCLUSION

The questions under investigation in this study were:

(1) What is the hierarchy of difficulty for the acquisition of English sentential complementation by adult speakers of Finnish?

(2) How does the invariant ordering for the adult Finnish speakers compare with other language groups learning English sentential complementation?

(3) Do the individual longitudinal orderings correspond with the the cross-sectional hierarchy of difficulty?

(4) For each subject do the orderings change significantly from one time to the next?

(5) What is the degree of diversity from one subject to another with regard to the longitudinal orderings?

(6) Can the acquisition process of complementation be seen as a continuum over time?

In this section, the answers to these questions will be discussed based upon the data obtained in the study.

5.1 What is the Hierarchy of Difficulty for the Acquisition of English Sentential Complementation by Adult Speakers of Finnish?

Using the Bart and Krus theoretical ordering technique, a hierarchy of difficulty was established for the subcategorization and syntactic categories. *Infin-END*, *Infin-END/Gerund*, and *Infin-NP/Gerund* were found to be the easiest subcategorization categories; the hardest subcategorization categories were *Infin-NP/That* and *Gerund/That*. With regard to the syntactic categories, the easiest categories were *To-Deletion*, *To Be-Deletion*, and *For-To*; *Tense Sequencing* and *Raising* were the hardest categories. Moreover, it was found that the environment--*NP* or *END*--influenced the difficulty of the complement selection for some verbs, with the NP environment being more difficult. There was an overgeneralization of the infinitive, which was also found by Anderson (1976) in her study. Unfortunately, there were too few items to examine in order to determine whether or not transference was a factor in the present study.

5.2 How Does the Invariant Ordering for the Adult Finnish Speakers Compare with Other Language Groups Learning English Sentential Complementation?

The present study had six subcategorization categories in common with Anderson. In comparing the orderings in this study with those of Anderson, it was found that there were six instances of agreement, and nine instances of an ordering in the Anderson study but no corresponding ordering in the present study. There was one instance in which neither study had an ordering for two categories. There were no instances of an ordering being foud in one study and the reverse ordering being found in the other study. It is significant that there were no instances of reverse orderings in the two studies. This would seem to indicate that there is some similarity between the two language groups in the acquisition of complement structures. If the processes were different, there should have been reverse orderings.

In trying to account for the six instances of agreement and the nine instances of no agreement, a possible explanation might be that the categories involved in the no agreements are those categories in which one set of verbs was used in the present study and another set was used in the Anderson study since it was found in the present study that not all the verbs within a category are of equal difficulty. Below in Figure 24 are the categories involved in the six instances of agreement and the nine instances of no agreement. Of the six instances of agreement, four involved the *Infin-END* category. With regard to the no agreement instances, four involved the *Poss-ing* category. Figure 23 presents an analysis of the verbs used in both studies for each category.

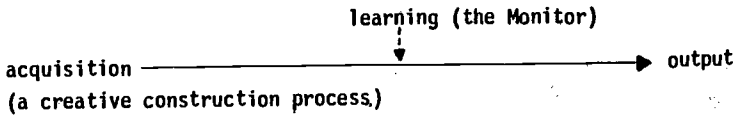
Agreement	*No Agreement*
Infin-END and Gerund	Infin-END and That
Infin-END and Poss-ing	Poss-ing and Infin-NP
Infin-END and Prep+Gerund	Poss-ing and That
Infin-END and Infin-NP	Poss-ing and Gerund
Infin-NP and That	Poss-ing and Prep+Gerund
That and Prep+Gerund	Prep+Gerund and Infin-NP
	Prep+Gerund and Gerund
	Gerund and That
	Gerund and Infin-NP

Fig. 24. Category Pairs Involved in Instances of Agreement and No Agreement Between Present Study and Anderson (1976)

As can be seen in Figure 25, it is not always the case that for instances of agreement, the verbs used in the category pairs were the same in both tests while for the no agreement cases different verbs were used in both studies. There were cases in which the categories involved in no agreement instances had different verbs in each study. Four of the no agreement cases involved *Poss-ing*, which had no verbs in common between the two tests while three of the no agreement cases involved *Prep-Gerund*, which had only one verb in common out of ten used on both tests. *Gerund*, on the other hand, which was involved in four instances of no agreement and one agreement, contained the same verbs in both tests. And *Infin-END*, which was involved in four cases of agreement, contained four more verbs in the Anderson study than in the present study.

It does not appear to be the case that the differences found between the two tests stem from the use of different verbs in the categories in common. Although some of the cases involved in the no agreements used different sets of verbs, so did one of the categories involved in quite a few instances of agreement. The reasons for the differences in the orderings for the studies must lie elsewhere. Another factor contributing to this difference in the results might be related to the type of tests used in each study. Anderson's test consisted of multiple choice and translation items only whereas the present study included five different tasks in addition to the translation task. Krashen (1977) contends that the type of elicitation task influences the results.

In order to account for differences in adult second language performance, Krashen has introduced the concept of a Monitor Model. The existence of the Monitor was first suggested by Labov (1970), who noted that under certain conditions (when the speaker is tired, distracted, angry, etc.) earlier acquired dialects become evident in speech production. The maintenance of prestige forms learned later in life is done through conscious audio-monitoring. Krashen suggests that a similar principle applies to a second language performance. The Monitor Model is illustrated by the diagram below:



Subcategorization Categories		Anderson (1976)		Present Study	
		English	Spanish	English	Finnish
That	IN COMMON:	think	pensar (think)	think	luula (think)
	OTHER:		creer (believe) estar seguro (to be sure) decir (say)		
Infin-END	IN COMMON:		querer (want)	want	
	OTHER:	offer	tratar (handle)		
Infin-NP	IN COMMON:	want	querer (want)		haluta (want)
	OTHER:	order	mandar (order)		auttaa (help)
Gerund	IN COMMON:		disgrutar (enjoy)	enjoy	nauttia (enjoy)
			terminar (finish)	finish	lopettaa (finish)
	OTHER:		dejar (stop)	can't help	
Poss-ing	IN COMMON:				
	OTHER:		resientir (resent) agradecar (thank)	enjoy prevent	
Prep+Gerund	IN COMMON:	plan on		plan on	
	OTHER:	think bf prevent from concentrate on talk about to be used to		believe in think about laugh at to be interestad in	

Fig. 25. List of Verbs Used in Six Categorization Categories in the Present Study and in Anderson (1976)

Speech production (ie., "output") is the result of "acquisition". Krashen believes that "acquisition" involves subconscious processes; "learning", on the other hand, involves conscious processes. Thus, Krashen makes a distinction between operating by "rule" (ie., learning) and operating by "feel" (ie., acquisition). Under certain conditions, the consciously learned system can monitor and change the shape of the subconsciously acquired system before it is spoken. The model thus predicts that the nature of second language performance errors will depend on whether or not monitoring is in operation. Errors resulting from monitoring will be more idiosyncratic since they will reflect each learner's conscious mental representation of linguistic regularities in the target language.

Krashen cites as evidence the fact that in the experimental data on morpheme acquisition only those situations in which monitoring appears to be most difficult yield a consistent difficulty order. For example, Bailey, Madden, and Krashen (1974) found a difficulty order similar to that found by Dulay and Burt (1973). Both studies used the Bilingual Syntax Measure, which consists of a set of cartoons and an accompanying set of questions. The Bilingual Syntax Measure is designed to elicit natural speech. The first language of the subjects did not seem to affect the results; Spanish and non-Spanish speakers performed almost identically.

Larsen-Freeman (1975) also used the Bilingual Syntax Measure for adult ESL learners. The difficulty order that she obtained was almost identical to that found in Bailey et al. (1974) and was not significantly different from that found in children acquiring English as a second language. On four other tests that she administered, however, there was less agreement among different first language groups and the orderings produced by the different tasks were not identical. These other four tasks did not involve natural communication, as did the Bilingual Syntax Measure, but focused on artifical problem-solving. These results could imply that this non-linguistic problem-solving ability is not necessarily utilized in natural conversation or in the performance of tasks such as the Bilingual Syntax Measure.

Thus, one reason for the differences in the orderings found by Anderson and in the present study may be due to the fact that both tests involved tasks that were controlled, and, as a result, there was monitoring required of the subjects. According to Krashen's Monitor Model, consistent difficulty order is produced with tests in which the monitoring is most difficult, such as in natural communication. Since

both tests required monitoring, the orderings thus differed.

A possible explanation for the fact that the Anderson study had more sequential orderings than the present study is the differences in the subjects' proficiency levels. The Anderson study included subjects of all proficiency levels--beginning, intermediate, and advanced --whereas the subjects in the present study were all advanced students of English. It is possible that many orderings were not evident in the present study because they occur with less-advanced English students.

5.3. Do the Individual Longitudinal Orderings Correspond with the Cross-sectional Hierarchy of Difficulty?

The cross-sectional hierarchy of difficulty was determined by the Bart and Krus theoretic ordering method. Given the structure of this ranking method, the prerequisite relationships determined by the method will parallel the individual rankings at one test time in the longitudinal data. This is because the theoretic method ordering method is based upon calculating the number of disconfirmatory responses for each item and comparing the percentage of disconfirmatory responses for one item with that of another item. If there are disconfirmatory responses for one item but not for another, the second item is considered to be prerequisite to the first item. Thus, in comparing the cross-sectionally derived ranking based on the Bart and Krus method with the individual rankings of the first time, the two will correspond since the theoretic ordering method counts instances in which all the subjects had difficulty with one item but not another. It is possible to find one or two students who do not mirror the group ranking because a tolerance level of five percent was allowed in consideration of extralinguistic factors, such as fatigue, misreading of questions, etc.

There is a weakness with the determination of prerequisite relationships using the Bart and Krus theoretic ordering method. According to the method, item pairs are in a prerequisite order if there is a 0.0 in the matrix, as in the example given in Figure 26. In this example,

	That	Infin-END
That	----	27.9
Infin-END	0.0	----

Fig. 26. Matrix of Disconfirmatory Responses

Infin-END is a prerequisite to *That* because a 0.0 appeared in the matrix under *That* for *Infin-END*. The percentage of disconfirmatory responses for the ordering *That* before *Infin-END* is moderately high (ie., 27.9). The problem that can arise with such a procedure becomes apparent when *both* of these percentages in the disconfirmatory response matrix are taken into consideration. When one of the percentages is 0.0 and the other is high, the percentages are strong indicators of a prerequisite relationship. If, however, both percentages are low, the results become less conclusive.

This problem becomes apparent in the analysis of the comprehension items on the complementation test. There are eight comprehension items, with one item for each comprehension category. A tolerance level of five percent is allowed because of extralinguistic factors. One ordering that proves problematic involves that of *forget +INFIN* and *ask*. The disconfirmatory responses for the ordering of *forget+INFIN* before *ask* is below five percent. The problem is that the disconfirmatory responses for the ordering of *ask* before *forget+INFIN* is also below five percent. Thus, the ordering of *forget+INFIN* before *ask* is confirmed and so is the ordering of *ask* before *forget+INFIN*.

A similar problem arises with the categories *easy* and *forget+INFIN*. The disconfirmatory response percentages are 2.4 for *forget+INFIN* before *easy* and 9.5 for *easy* before *forget+INFIN*. According to the analysis procedure, *easy* would be considered a prerequisite to *forget+INFIN*. The problem is that the percentage used in collaborating the ordering of *forget+INFIN* before *easy*--9.5--is very low. Positing *easy* before *forget+INFIN* is thus based on what only a few of the subjects did (in this case, what three subjects did). This same problem is evident in the ordering of *forget+INFIN* and *eager* and in the ordering of *ask* and *eager*. Other instances of this occurred with the production items.

One possible way to rectify this type of problem would be to set tolerance levels not only for category X over category Y (X>Y) but also for category Y over category X (X<Y). In other words, while the X>Y percentage must be below five, the X<Y percentages must be above twenty or thirty.

An alternative method is proposed by Andersen (1978), who presents a revised version of the Bart and Krus Ordering-Theoretic Method called the quantitative Test for Individual Fit to Group Accuracy Order. Andersen's model consists of two types of implicational matrices: a quantitative implicational matrix and a variable implicational matrix.

The quantitative implicational matrix comprises two percentages for each pair of categories (X/Y). One percentage is of subjects for whom the score for category X is equal to or larger than the score for category Y (ie., %X≥Y). The other percentage is of students for whom the score for category X is larger than the score for category Y (ie., %X>Y). In other words, identical scores are omitted from consideration when calculating the second percentage.

Based upon the %X>Y scores, a variable implicational matrix is derived. In a variable implicational matrix, each of the %X>Y scores is replaced by one of the following: 1, 0, or X. "1" is used when the percentage of subjects with the order X>Y is significantly greater than chance and "0" is used when the percentage is significantly lower than chance. "X" is used when the percentage is not significant (ie., when there are roughly equal numbers of subjects with each order). Significance is determined by the chi-square test.

One way to compare Andersen'n Quantitative Test for Individual Fit to the Group Accuracy Order with the Bart and Krus Ordering-Theoretic Method is to apply it to data in the present study. Table 45 presents the results when the comprehension data are analyzed according to the Andersen method.

As stated earlier, several problems arise when the comprehension data are analyzed according to the Bart and Krus Ordering-Theoretic Method, especially with the *forget+INFIN/ask* categories. The results in Table 45 reveal that the Andersen method cannot establish a prerequisite relationship between these two categories. This is because there are not enough X>Y/X<Y responses to do a chi-square test. In doing a chi-square test, the expected frequency must not be less than five. In order to meet this condition, there must be at least ten X>Y/X<Y responses. For the *forget+INFIN/ask* categories, there is only one X>Y response and one X<Y response, resulting in the total number of X>Y/X<Y responses being less than ten. Thus, according to the Andersen procedure, significance cannot be established. For the same reason, Andersen's method also indicates that it is not possible to establish an ordering between *forget+INFIN* and *easy*.

The lack of a minimum number of X>Y/X<Y responses is also the

TABLE 45

QUANTITATIVE TEST FOR INDIVIDUAL FIT TO THE GROUP ACCURACY ORDER FOR COMPREHENSION ITEMS

QUANTITATIVE IMPLICATIONAL MATRIX

	Eager	Easy	Ask	Promise	Stop+ING	Stop+INFIN	Forget+INFIN	Forget+ING
Eager %X≥Y / %X>Y		91 / 43**	88 / 17**	91 / 83	91 / 67*	91 / 82	88 / 17**	98 / 94
Easy			91 / 20**	98 / 94	91 / 69*	93 / 86	88 / 20**	98 / 95
Ask				100 / 100	100 / 100**	100 / 100	98 / 50**	100 / 100
Promise					64 / 21	74 / 48*	64 / 0	74 / 48*
Stop+ING						88 / 75	79 / 10	88 / 77
Stop+INFIN							64 / 0	81 / 56*
Forget+INFIN								98 / 96

Top score for X≥Y
Bottom score for X>Y
* = Random variation (by chi-square test)
** = Chi-square test not applicable because expected frequency is less than 5.

VARIABLE IMPLICATIONAL MATRIX

	Eager	Easy	Ask	Promise	Stop+ING	Stop+INFIN	Forget+INFIN	Forget+ING
Eager		-	-	1	X	1	-	1
Easy	-		-	1	X	1	-	1
Ask	-	-		1	-	1	-	1
Promise	0	0	0		0	X	0	X
Stop+ING	X	X	-	1		1	0	1
Stop+INFIN	0	0	0	X	0		0	X
Forget+INFIN	-	-	-	1	1	1		1
Forget+ING	0	0	0	X	0	X	0	

Test of hypothesis X>Y
0 = Disconfirmation of order
1 = Confirmation of order
X = Random variation (chi-square)
- = No disconfirmation/confirmation possible

reason for the *ask/stop+ING* prerequisite relationship in Table 42 not being confirmed in Table 45. Even though there are eight X>Y responses and no X<Y responses, the total number of X>Y/X<Y responses is less than ten. As a result, significance cannot be determined by the chi-square test.

One difference, therefore, between the Bart and Krus method and the Andersen method is that the method proposed by Andersen prevents orderings based upon a limited number of responses. The Bart and Krus method has no such restriction: it establishes a prerequisite relationship if there are two X>Y responses (2/42 yields 4.8 percent, which is below the tolerance level) and at least three X<Y responses (3/42 yields 7.1 percents, which is above the tolerance level). Thus, the Bart and Krus method establishes a prerequisite relationship on the basis of only five responses. As suggested earlier, one way to prevent this is to set a tolerance level for the diconfirmatory X<Y responses. A tolerance level of more than twenty-three percent for the X<Y responses would ensure that there are a total of at least ten X>Y/X<Y responses.

There is another difference between the two methods. Seven prerequisite relationships indicated by the Andersen method are not established by the Bart and Krus method: *eager* before *promise*, *eager* before *stop+INFIN*, *easy* before *stop+INFIN*, *promise* before *stop+ING*, *stop+ING* before *stop+INFIN*, *stop+ING* before *forget+ING*, and *forget+INFIN* before *stop+ING*. Thus, another difference between the two methods is that the Andersen method establishes more prerequisite relationships than the Bart and Krus method. The reason for this is that the Andersen method allows more disconfirmatory responses. For example, with the categories eager (X) and promise (Y) there are nineteen X = Y responses, nineteen X>Y responses, and four X<Y responses. The Bart and Krus method does not establish an ordering because it allows no more than two disconfirmatory responses: three disconfirmatory responses would yield a percentage above the tolerance level. The Andersen method, on the other hand, tolerates six disconfirmatory responses. Six disconfirmatory X>Y responses yield a significant chi-square value when there are at least seventeen X<Y responses. Thus, although the Andersen method sets up more prerequisite relationships by allowing more disconfirmatory responses, it does so only when there are minimum numer of X>Y/X<Y responses.

Changing the tolerance levels in the Bart and Krus method will not yield results more similar to those of Andersen. In order to establish the seven additional orderings indicated by Andersen, a tolerance level of less than twelve percent must be set for the X>Y responses since the disconfirmatory responses for these seven additional orderings established by Andersen ranged from 2.4 to 11.9 percent. The disconfirmatory responses for the X<Y responses ranged from 21.4 to 45.2 percent; therefore, a tolerance level of more than twenty-one percent is needed for the X<Y responses. By setting up these tolerance levels, the Bart and Krus method would establish these seven additional orderings, but it would also establish an ordering not indicated by Andersen: *easy* before *stop+ING*. The percentage of disconfirmatory X>Y responses is 9.5 while the percentage for the disconfirmatory X<Y responses is 21.4. Both percentages fall within the tolerance levels. According to the Andersen method, the responses are variable.

The *easy* before *stop+ING* ordering illustrates the main difference between the two methods. *Easy* before *stop+ING* has a disconfirmatory X>Y-response percentage of 9.5. *Eager* before *stop+INFIN* also has a disconfirmatory percentage of 9.5 for the X>Y responses, but this ordering is significant according to the Andersen method. The difference is that *eager/stop+INFIN* disconfirmatory percentage for the X<Y responses is 42.9 while for *easy/stop+ING* it is 21.4. In the Bart and Krus method, the number of X>Y and X<Y responses is compared with the total number of responses (X = Y/X>Y/X<Y). The Andersen method compares the number of X>Y and X<Y responses with the number of X>Y/X<Y responses only. Thus, in the *easy/STOP+ING* ordering, the four X<Y responses do not result in the ordering being significant since there are only thirteen X>Y/X<Y responses altogether. With the *eager/stop+INFIN* ordering, the four X<Y responses are significant since there are twenty-two X>Y/X<Y responses: eighteen out of twenty-two responses are X>Y.

Thus, the Andersen method has the advantage of establishing more prerequisite relationships but does so only when there is a sufficient number of X>Y/X<Y responses. In order to place a similar constraint on the Bart and Krus output, a more conditional tolerance level must be set. Such a condition might be: if the percentage for the disconfirmatory X>Y responses is less than ten, then the percentage for the disconfirmatory X<Y responses must be more than twenty-eight. As in the Andersen method, the proposed condition would ensure that there are

a minimum number of X>Y/X<Y responses.

In sum, a comparison of the Bart and Krus Ordering-Theoretic Method with the Andersen Quantitative Test for Individual Fit to Group Accuracy Order reveals that the methods differ in two ways. The Bart and Krus method establishes prerequisite relationships on the basis of a limited number of responses; the Andersen method does not. Moreover, the Bart and Krus method allows fewer disconfirmatory responses than the Andersen method. The Andersen method permits a larger number of disconfirmatory responses only when there are a certain number of X>Y/X<Y responses. The Bart and Krus method is thus more restrictive in the number of disconfirmatory responses allowed but is less restrictive in the minimum number of X>Y/X<Y responses required. If tolerance levels are set for the X<Y disconfirmatory responses (in order to ensure a minimum number of X>Y/X<Y responses), the Bart and Krus method proves to be a more rigorous procedure than that proposed by Andersen.

5.4 For each Subject Do the Orderings Change Significantly from One Time to the Next?

An analysis of the longitudinal data revealed that the rankings for the individual subjects changed from one test time to another. There was also a great deal of backsliding evident in the data. These results correspond with those found by Rosansky (1976) and Labov and Labov (1976). Rosansky found fluctuation in the ranking of categories over time in her data on second language acquisition of morphemes and Labov and Labov found this fluctuation evident in their data on the first language acquisition of WH-questions.

The findings here and in the other two studies indicate that language systems are in a state of flux and that the difficulty of items change over time. The implication is that rankings determined cross-sectionally will be valid only for that point in time at which they are composed and that they will not be maintained over time because the rankings for the individual subjects are fluctuating. This argues for more emphasis to be put on doing longitudinal studies in second language acquisition research instead of assuming that cross-sectionally derived rankings will mirror the ordering found over time. It also implies that these longitudinal studies should cover a fairly long period of time with testings at frequent intervals. This is necessary because the acquisition process appears to be one of gradual improvement

with a great deal of backsliding.

Also important in this longitudinal study would be determining if different items correlated with each other. In the present study, it did not appear to be the case that certain categories were learned with others. An analysis of Tables 20 through 22 revealed that there were no significant correlations between two categories on all three testings. In a longitudinal study, however, such correlations may become apparent.

5.5 What is the Degree of Diversity from One Subject to Another with Regard to the Longitudinal Orderings?

In addition to the individual orderings changing over time, there was a great deal of diversity in how these orderings changed. It was not the case that the fluctuations of the individual subjects appeared to be similar. In addition to accounting for the differences between the Finnish and Spanish subjects, the Monitor Model might also account for this large diversity found among the subjects. Since the tasks in the study allow monitoring, the errors are predicted to be more idiosyncratic. Thus there would be less consensus among the subjects. The effect of monitoring might also account for the fluctuation in the individual rankings from one test time to the next.

One implication from the diversity found in the study would be that the language acquisition process is not as uniform among the learners as indicated in previous second language acquisition studies (ie., Dulay and Burt, 1973, 1974; Bailey, Madden and Krashen, 1974). Before such conclusions are made, however, further investigation needs to be made into how much monitoring effects the results of controlled studies. It may be that in natural speech, the subjects would be more uniform in their difficulty hierarchies.

A practical implication of this diversity for ESL teachers is that they should not be surprised if their students do not grasp the same structures at the same time. Given here that the students found different things difficult at different times, they should also not be surprised if a student seems to have little difficulty with an item at one time but more difficulty with the same item later. Fluctuations in difficulty were found with all the subjects and especially prevalent was the backsliding.

5.6 Can the Acquisition Process of Complementation Be Seen as a Continuum Over Time?

Unlike the results of the phonological study by Dickerson (1975) and the syntax study on negation by Hyltenstam (1977), which indicated that the acquisition process was a continuum, the results of the present study do not indicate that the acquisition process of English sentential complementation is a continuum. As discussed in Sections 5.4 and 5.5, the rankings for individual subjects fluctuated from test time to test time and there was a great deal of diversity in the rankings over time from subject to subject. It was not the case that one sequential ordering was evident in the marjority of the subjects over the entire testing period.

Although the overall acquisition process did not appear to be a continuum process, there did appear to be evidence of internal regularity (Adjemian, 1976) in the interlanguage of a second language learner. In analyzing individual responses and by looking at the different environments, it was found that the responses of the subjects were not haphazard but were consistent for certain verbs in different environments.

5.7 Conclusion

The most important finding in this study is the existence of variation in the acquisition of English sentential complement structures and the fact that such variation is obscured by cross-sectional group data. It was found that over time there is a great deal of fluctuation in individual rankings of difficulty. Not only was there variation within an individual, but there was also variation from one language learner to the next. In other words, in addition to varying over time for an individual, rankings of difficulty also varied from individual to individual. The language learning process seems to be very individualistic. Such findings add confirmation to the doubts raised by Rosansky (1976) and others about the validity of equating group rankings with individual rankings and of equating cross-sectional rankings with longitudinal rankings.

The implication of this finding is that researchers must be wary of making claims about the language acquisition process based upon cross-sectional group data. That this process seems to vary from individual to individual indicates that language is not learned in the same way by every individual. More detailed studies of individual language learners are needed in order to adequately describe the language learning process.

A further implication of this study is that current theories of language acquisition must account for variation in the language learning process. The fact that there was a great deal of variability in the responses of individual subjects over time cannot be ignored. As stated in Section 2.2.2, the interlanguage hypothesis cannot account for variability. Yet variability was so prevalent that rankings fluctuated significantly from testing to testing for most of the subjects. An adequate theory of language acquisition must be able to account for this variability. The notion that the acquisition process be thought of as a linguistic continuum has merit because of its ability to account for the dynamic aspect of language learning. Learners do not seem to proceed through a succession of well-defined and coherent systems as the interlanguage hypothesis assumes but to move within a continuum. And within this continuum, there will be backsliding and fluctuations.

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APPENDICES

APPENDIX I

COMPLEMENTATION TEST

I. Translate the following sentences into English

1. Haluan, että John menee.
2. Mary auttoi Johnia opiskelemaan tutkintoaan varten.
3. Hän lupasi Billille, että hän lähtisi.
4. John päätti, että hän menisi Chicagoon.
5. Bill luulee, että Mary rakastaa Johnia.
6. Bill sanoi, ettei ole totta, että Mary menee Chicagoon.
7. Bill myönsi rikkoneensa ikkunan.
8. John nauttii autonsa pesemisestä.
9. Bill saattoi päätökseen talonsa maalaamisen.
10. Mary lopetti tupakoimisen.
11. John unohti tavata Maryn eilen.
12. Kuulin pojan laulavan.

II. Fill in the blanks with the correct form of the word(s) in parentheses.

Example: The teacher knows where the student __is__ (to be)

1. I laughed at _____ it. (to hear)
2. I saw the tree _____. (to fall)
3. Bill wants _____. (Bill leave)
4. Money makes people _____ (to be happy)
5. _____ the exam is not good. (I fail)
6. John _____ to be elected. (it is probable)
7. I was delighted at _____. (he came)
8. Bill recommended that they _____ to the show. (to go)
9. I heard the girl _____. (to shout)
10. Mary likes _____ her car. (Mary drives)
11. Mary's father insisted that she _____ every night. (to study)
12. The doctor made Mary _____. (to be well)
13. He enjoyed _____. (Mary sang)
14. The guard let the people _____. (to enter)

III. Combine the following sentences to form a sentence with one of the three types of clauses: infinitival (e.g., John stopped to read), gerundive (e.g., John stopped reading), or clausal (e.g., John thought that he should read).

Example: John stopped it. John was reading a book.
John stopped reading the book.

1. Bob wanted it. Sam did pass his exam.
2. John denied. John didn't steal the money.
3. Bill planned it. Bill went to Chicago.
4. It was necessary. Mary did pass her exam.
5. John prevented it. Mary wanted to buy a new dress.
6. John thinks it is so. Bill is intelligent.
7. I am thinking about it. I want to go on a trip.
8. The Trojans demanded it. Helen returned home.
9. He is interested in it. He plays baseball.
10. Mary expected it. John sold his car.
11. Mary resented it. Sam won the prize.
12. Mary hopes it is so. John will buy a new car.
13. The people enjoyed it. Mary sang yesterday.
14. The Romans suggested it. The Greeks surrender.
15. It is bad. John is angry.
16. It is likely. John will go to Chicago.

IV. Complete the sentences below by using the sentences in the parentheses.

Example: Mary hated __leaving New York__.
(Mary left New York)

1. I want _____.
(I went to the show)
2. Mary must remember _____.
(Mary returned the books)
3. I noticed _____.
(The cat ate the bird)
4. The students can't help _____.
(They are angry)
5. The police stopped _____.
(He was driving too fast)

6. Mary promised _____.
(Mary went)

7. They have finished _____.
(They built a house)

8. Bill had thought _____.
(John bought a car)

9. John decided _____.
(He broke the window)

10. The little boy admitted _____.
(He broke the window)

11. He forgot _____.
(He told her a lie)

V. Complete the following sentences by selecting the correct word or phrase and circling the correct answer.

Example: I want to a. join a university.
b. assist
c. attend
d. attend to

1. We plan on a. swim in the lake today.
b. swimming
c. to swim
d. that we swim

2. No one regrets a. them going away.
b. for them
c. their
d. for their

3. That John will win the race a. appears.
b. seems
c. happens
d. matters

4. John made Mary a. cooks the dinner.
b. cooking
c. to cook
d. cook

5. I saw a. the boy to fall
b. for the boy to fall
c. for the boy fall
d. the boy fall

6. The car is a. impossible to be sold.
b. necessary
c. probable
d. unlikely

7. a. John is nice is well-known.
b. That John
c. For John
d. John's

8. Please let a. me to go
b. me going
c. that I go
d. me go

9. Bill suggested that Mary a. sees a doctor.
b. seeing
c. see
d. to see

10. It is impossible a. for to finish the work
b. finish
c. for finish
d. to finish

11. Too much ice cream makes children a. to be sick
b. sick
c. being sick
d. were sick

12. a. His to be rich is unfair.
b. Him
c. For him
d. For his

13. John should have Mary a. to bake some bread.
b. bake
c. bakes
d. baking

14. Mary believes in a. tell the truth.
b. tells
c. to tell
d. telling

15. I heard a. for the teacher sing
b. the teacher sing
c. for the teacher to sing
d. the teacher sing

16. John is a. likely to be elected
b. impossible
c. unusual
d. strange

17. John had hoped a. to go
b. going
c. goes
d. that John go

18. I enjoy a. that I fish
    b. fishing
    c. fish
    d. to fish

19. Mary can't make the silver a. to be shined
    b. shining
    c. being shined
    d. shine

20. Bill likes a. Bill to play baseball.
    b. for Bill to play
    c. to play
    d. himself to play

21. I couldn't walk after my operation so the doctor didn't want a. him to go home
    b. I
    c. me
    d. my

VI. Substitute the following verbs into the sentences above them. *BE SURE AND MAKE ALL THE NECESSARY CHANGES!*

Example: John loves to go fishing.
John hates *going fishing*.

1. Mary thinks that John went to Chicago.
   Mary expected
   Mary noticed
   Mary thought about
   Mary stopped
   Mary decided
   Mary forgot about
   Mary helped

2. Bill likes to play baseball.
   Bill wants
   Bill stopped
   Bill believes in
   Bill denied
   Bill hopes
   Bill plans on
   Bill admits
   Bill finished

VII. Check the appropriate response.

Example: John likes jazz music but Mary doesn't.

John likes jazz music.	yes__	no__
Mary likes jazz music.	yes__	no__

1. John is eager to please.

John pleases someone.	yes__	no__
Someone pleases John.	yes__	no__

2. Mary asked Bill to leave.

Mary left.	yes__	no__
Bill left.	yes__	no__

3. Bill stopped smoking.

Bill smoked somewhere.	yes__	no__
Bill doesn't smoke.	yes__	no__

4. John forgot to tell Mary about the accident.

John told Mary about the accident.	yes__	no__

5. Jane promised Sam to come.

Sam came.	yes__	no__
Jane came.	yes__	no__

6. Mary is easy to please.

Someone pleases Mary.	yes__	no__
Mary pleases someone.	yes__	no__

7. Bill stopped to talk.

Bill talked somewhere.	yes__	no__
Bill didn't talk.	yes__	no__

8. John forgot telling Jane about the robbery.

John told Jane about the robbery.	yes__	no__

APPENDIX II

INDIVIDUAL SCORES (% CORRECT RESPONSES)

Subcategorization Categories

Infin-END

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	50	67	100	100	96	.13

Infin-END/Gerund

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00

Infin-NP/Gerund

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00

Prep+Gerund

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	67	86	100	100	100	86	100	86	100	100	100	100	96	.09
2	100	100	100	100	86	100	100	100	100	100	100	100	100	100	86	100	86	100	100	100	100	98	.05
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00

Infin-NP

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	50	100	100	100	100	100	100	100	100	100	100	100	100	75	100	100	100	100	100	100	86	.12
2	100	75	100	100	100	100	50	75	100	100	100	100	75	100	100	100	100	100	75	100	75	92	.14
3	100	75	100	100	100	100	100	100	100	100	100	100	100	100	100	100	75	100	100	100	75	94	.14

Infin-END/That

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	100	100	80	80	100	100	100	100	100	100	80	97	.07
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	.00
3	80	80	100	100	100	100	83	100	100	100	100	100	100	100	100	100	100	75	100	100		96	.08

Prep+Poss-ing

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	100	67	100	100	100	100	67	100	100	100	100	97	.10
2	100	100	100	67	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98	.07
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	67	100	100	100	100	100		98	.07

Gerund

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	67	100	100	100	100	100	60	67	100	50	100	83	60	90	.17
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	50	100	60	60	100	100	50	91	.18
2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	50	98	.11

Poss-ing

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	100	67	100	100	100	100	67	67	100	67	67	92	.15
2	100	100	100	100	67	100	100	100	100	100	100	100	100	100	100	100	67	100	100	100	67	95	.12
3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	67	100	100	100	67	97	.10

That

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	100	100	100	67	100	100	50	100	67	100	100	100	50	67	91	.18
2	100	100	100	100	100	100	100	67	100	100	100	100	100	100	100	100	100	100	100	50	100	96	.13
3	100	100	100	100	100	100	100	100	100	100	100	100	100	50	100	67	100	100	50	50	100	91	.19

Infin-NP/That

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	71	100	83	100	57	100	86	86	86	86	100	86	71	83	100	71	57	71	86	57	84	.15
2	100	100	100	100	100	57	100	71	86	86	86	71	86	86	86	86	86	86	71	57	71	84	.14
3	100	100	100	100	86	86	86	100	86	86	71	71	71	100	100	71	71	86	43	57	86	84	.16

Poss-ing/That

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	100	100	100	100	50	50	50	100	100	100	50	0	50	100	100	0	100	100	79	.34
2	100	100	50	100	100	100	100	100	50	0	50	100	100	100	0	50	50	100	50	0	50	69	.37
3	100	100	100	100	100	50	100	100	0	100	100	50	100	100	0	50	50	100	50	50	50	74	.34

Gerund/That

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	60	75	60	0	67	100	100	80	60	60	20	0	60	40	40	20	75	40	25	56	.32
2	100	100	100	60	80	100	80	60	100	80	40	20	40	60	100	20	40	50	80	0	60	65	.31
3	100	100	100	100	50	100	0	100	100	100	80	80	20	60	100	60	50	80	60	20	40	71	.32

Syntactic Categories

To-Deletion

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	100	100	89	89	89	100	89	88	83	100	100	71	89	67	88	86	89	89	89	88	90	.09
2	100	100	89	88	89	100	89	89	83	89	100	83	100	33	89	57	100	89	89	89	75	87	.16
3	100	100	100	100	89	100	89	89	78	86	89	100	67	100	38	100	57	89	100	89	78	87	.17

For-To

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	50	100	100	100	67	100	100	50	75	67	100	100	33	25	67	100	67	100	100	75	25	75	.28
2	67	100	100	100	33	50	100	100	67	100	100	100	33	67	75	100	50	100	100	100	50	81	.25
3	100	100	100	100	50	50	100	75	100	100	100	100	67	75	100	50	67	100	67	100	67	81	.21

To-Be-Deletion

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	50	100	100	100	67	100	33	100	100	100	100	100	100	100	100	100	100	100	33	100	100	90	.23
2	100	100	100	100	100	100	33	100	100	100	100	100	100	100	100	33	100	100	33	33	100	87	.27
3	100	100	100	100	100	33	33	100	100	100	100	100	67	100	100	33	100	100	100	100	100	98	.24

Possessive

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	63	50	88	86	100	78	100	100	43	100	80	60	71	100	38	100	67	100	57	56	100	78	.22
2	67	100	86	86	100	78	100	100	50	86	88	100	71	100	100	89	33	100	88	73	100	85	.18
3	100	100	100	75	86	88	100	56	63	90	100	100	83	100	88	88	43	100	100	83	83	87	.16

Tense Sequencing

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	88	64	71	87	89	63	73	69	93	81	77	88	85	75	57	75	79	45	78	54	89	75	.13
2	88	67	69	85	90	75	83	67	85	89	73	85	75	63	82	75	86	79	73	44	82	77	.11
3	89	92	64	88	86	100	67	94	83	67	85	82	70	78	86	67	80	83	67	63	85	80	.11

Raising

Test	Subject 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	Mean	SD
1	100	50	50	50	67	33	33	67	67	67	75	100	50	67	25	67	67	50	33	67	33	58	.20
2	100	67	50	50	75	50	75	33	67	67	50	50	50	50	50	67	100	50	33	67	67	60	.18
3	100	75	50	50	75	33	67	67	67	67	75	100	67	50	50	33	100	50	67	75	33	64	.20